APPENDIX A

NOTICE OF PREPARATION
AND
SCOPING REPORT

Kilarc-Cow Creek Hydroelectric Power License Surrender Project Water Quality Certification EIR: Scoping Report

State Clearinghouse # 2013032029

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Shaping the Future

Document Information

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Acronyms

ADU	Abbott Ditch Users
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
LSA	License Surrender Application
NOP	Notice of Preparation
EIR	Environmental Impact report
EIS	Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
MOU	Memorandum of Understanding
NMFS	National Marine Fisheries Service
PG&E	Pacific Gas and Electric
PM&E	Protection, Mitigation, and Enhancement

1 Introduction

The State Water Resources Control Board (State Water Board) is the California Environmental Quality Act (CEQA) lead agency for the Kilarc-Cow Creek Hydroelectric Project License Surrender, under its discretionary Section 401 water quality certification authority. Pacific Gas and Electric Company (PG&E) owns and operates the Kilarc-Cow Creek Hydroelectric Project. The Kilarc-Cow Creek Hydroelectric Project is licensed by the Federal Energy Regulatory Commission (FERC), and is designated FERC Project No. 606. The existing license expired on March 27, 2007, and the Kilarc-Cow Creek Hydroelectric Project continues to operate under an annual license. On March 12, 2009, PG&E filed its application to surrender the license for operation of the project and to decommission and remove or modify several project features, including: (1) remove diversion dams and allow for free passage of fish and sediments; (2) leave in place some diversion dam abutments and foundations to protect stream banks and provide grade control; (3) leave in place and secure powerhouse structures for future reuse; (4) remove electric generators, turbines, and other equipment; (5) grade and fill forebays; and, (6) in consultation with affected landowners, leave in place, breach, or fill canal segments and remove metal and wood flume structures. Additionally, PG&E proposes to retire access roads to the project where possible. In compliance with the National Environmental Policy Act (NEPA), a Final Environmental Impact Statement (EIS) was issued by FERC on August 16, 2011.

On July 6, 2012, PG&E applied to the State Water Board for a Clean Water Act Section 401 water quality certification for the Kilarc-Cow Creek Hydroelectric Project License Surrender. The State Water Board must comply with CEQA prior to issuing any certification. The State Water Board determined that the FERC EIS does not fully comply with CEQA, and therefore has determined that it is necessary to prepare a separate EIR in conformance with the CEQA Guidelines. The State Water Board released a Notice of Preparation (NOP) communicating the intent to prepare an EIR for the issuance of a Section 401 Water Quality Certification for the Project on March 12, 2013. The NOP was distributed to the State Clearinghouse, agencies and individuals. The NOP, included in Appendix A, provides a description of the Project, the location of project activities, and the resources and environmental concerns to be analyzed in the EIR. The NOP also requests that comments on the content of the EIR and potential Project alternatives be submitted by April 22, 2013.

The State Water Board also conducted a CEQA scoping meeting to provide the public with the opportunity to provide input prior to the preparation of the EIR, pursuant to CEQA Guideline Section 15083. Public notices of the NOP and scoping meeting were published in the East Valley Times (March 7th and 21st issues) and Redding Searchlight (March 12, 13, 16, 17, 23, 24, 30, 31 and April 6). The meeting took place on April 10, 2013 from 6:00 p.m. to 8:00 p.m. at the Millville Grange in Palo Cedro, California. Copies of the newspaper notices are also included in Appendix A. The scoping meeting presentation is included in Appendix B.

This report summarizes the written and oral comments received during the scoping period, March 12, 2013 through April 22, 2013. Chapter 2 provides a list of the commenting agencies and organizations. Chapter 3 summarizes all of the comments received on the NOP and includes a matrix of comments received during the scoping period. The written responses to the NOP and other written comments submitted at the scoping meeting (full text) from public agencies, organizations, and individuals are included in Appendix C. A full transcript of the oral comments received during the scoping meeting is included as Appendix D.

Copies of comments received to date can also be found on the State Water Board website, at:

http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/kilarccow_comments041013.shtml

2 Commenting Agencies and Organizations

2.1 Written Comments

The following agencies, organizations and/or members of the public provided written responses to the NOP by letter or electronic mail (email) during the Kilarc-Cow Creek Hydroelectric Project License Surrender EIR public scoping period. The numbering of the written responses correlates to the appearance of each in Appendix A.

Public Agency

1. Shasta County

Project Proponent

2. Pacific Gas & Electric

Landowners/Local Residents

3. David Albrecht – Letter 1
4. David Albrecht – Letter 2
5. David Albrecht – Emails
6. James Fletter
7. Jim Hamilton via Kelly Sackheim
8. Erik Poole
9. RJ Roth via Bob Whitmore
10. Kelly Sackheim – Email 1
11. Kelly Sackheim – Email 2
12. Kelly Sackheim – Email 3
13. Kelly Sackheim – Email 4
14. Kelly Sackheim – Email 5
15. Kelly Sackheim – Email 6
16. Kelly Sackheim – Email 7
17. Bob Stanton
18. Heidi Strand
19. Steve and Bonnie Tetrick

The following agencies and individuals submitted written comments at the scoping meeting on April 10, 2013:

Public Agencies

SM 1. California Department of Fish and Wildlife

SM 2. National Marine Fisheries Service

Land Owners/Local Residents

SM. 3 David Albrecht

SM 4. Richard Ely, Davis Hydro, LLC

SM. 5 James Fletter

SM. 6 Heidi Strand

2.2 Oral Comments

The following agencies, organizations and/or members of the public provided oral comments during the Kilarc-Cow Creek Hydroelectric Project License Surrender EIR public scoping meeting and are listed in speaking order:

Speaker and Affiliation (if provided)

Bob Rynearson, Land Manager, Beatty & Associates

Kelly Sackheim

Betsy Bivin

Richard Ely, Davis Hydro, LLC

David Albrecht

William Farrell

Matt Myers, California Department of Fish and Wildlife (CDFW), formerly Department of Fish and Game

David White, National Marine Fisheries Service (NMFS), FERC Coordinator and Fish Passage Engineer

Erik Poole

3 Summary of NOP Responses

The purpose of the NOP is to solicit input "as to the scope and content of the environmental information to be included in the EIR" (CEQA Guidelines Section 15375). The following provides a summary of the responses to the NOP, including all written comments mailed, emailed or submitted at the public scoping meeting as well as oral comments received during the scoping meeting. Those comments highlighted address the content of the EIR, including concerns about potential impacts and the scope of the analysis to be covered under the EIR. In general, issues raised in those comments include those that pertain to the potential physical, biological or social changes resulting from the project and can be addressed in a technical manner, without speculation, in the EIR. A more detailed matrix of comments is provided at the end of this section, in Table 1.

3.1 General Comments

General comments received to date primarily focus on concerns related to inaccuracies or inadequacies in the Environmental Impact Statement (EIS) previously prepared by FERC. Many of the responses to the NOP included attached copies of comment letters previously submitted to FERC. Key general comments include:

- a lack of accuracy in the supporting studies used for the EIS analysis, specifically deficiencies in the cultural and biological resource studies
- a general dissatisfaction with the alternatives analyzed by FERC
- the deficiency of the Protection, Mitigation and Enhancement (PM&E) measures proposed by PG&E in their license surrender application (LSA), including the need to develop PM&E GEOL-3 (design plans and specifications) now for review during the environmental process
- the need to state clear objectives
- the need for SWRCB "neutrality"
- consideration of property rights in the EIR analysis
- more inclusion of stakeholders in the DLSA process
- difficulty in establishing PG&E's rationale for dismissing significant issues
- draft mandatory conditions of water quality certification to be issued with EIR
- address interests of the Abbott Ditch Users
- CDFW and NMFS support the decommissioning plan

3.2 Public Agency Comments

As noted above, comments from both the California Department of Fish and Wildlife and National Marine Fisheries Service communicate the agencies' continued support of the proposed decommissioning plan.

Shasta County comments are primarily directed at the need to fully address alternatives previously presented to FERC by the Coalition. In addition to the County, the Coalition members include Evergreen Shasta Power, LLC, the Abbott Ditch Users (ADU), and the Tetrick Ranch. Alternatives and options include maintaining the Kilarc plant and decommissioning the South Cow plant as well as land trades, mitigation, and offers of acquisition(s) for maintaining all or part of the FERC Project. The County also suggests pre-decision by signatories to the Memorandum of Understanding (MOU) for decommissioning without including all interested parties.

3.3 Project Alternatives

Suggested alternatives to removal of site facilities include the use of facilities by small hydroelectric power developers, leaving facilities in place, and development of an anadromous fish research facility. Comments stressed the importance of the site's habitat, aesthetic, water, and recreation resources, which would be adversely affected by the proposed decommissioning plan. There are also many concerns related to the disposition of water rights related to the decommissioning plan. Comments include:

- maintain the Kilarc plant and decommission the South Cow plant
- suggest land trades, mitigation, and acquisition to maintain all or part of the FERC Project
- leave facilities in place
- clarification that the No Project Alternative should not state that hydroelectric would continue indefinitely
- question why the EIR would address the combined effects of Alternatives 1 and 2
- the action alternatives in the EIS were not defined or qualified well and not anticipated by local residents
- removal of the Abbott Ditch Diversion should be eliminated from the plan and/or alternatives
- alternatives should be developed that respect adjudication
- the no action [no project] alternative must ensure the current decreed water supply remains in place
- previously suggested alternatives were dismissed without warrant, all alternatives should be considered
- copy of petition supporting the preservation of Kilarc Reservoir and the rest of PG&E's infrastructure that can be repurposed
- others are prepared to take responsibility for the facilities and they should be donated rather than destroyed
- address Kilarc Development separately from Cow Creek Development in the EIR
- FERC alternatives were minor variations of the same plan
- suggest mandatory condition to allow facilities to be re-commissioned rather than dismantled
- need an "in place" physical solution to water delivery to the Wagoner Ranch
- Tetrick Ranch "Technical Solution" for water delivery to Diversion 73
- Davis Hydro proposal to create public private partnership for continued hydro use and anadromous fish research

3.4 Environmental Impact Analysis

The following comments pertain to specific resources or environmental concerns that should be addressed in the EIR including the technical appendices.

<u>Aesthetics and Visual Resources</u>

Kilarc Forebay and the pathways adjacent to the canal are considered high quality viewing areas for local residents. Specific comments included the lack of consideration of enough key observation points in the prior EIS analysis.

Agricultural Economics and Land Use

A number of comments have been made regarding water rights and the concern that the Project would result in the loss of irrigation water to local ranches that are currently dependent on water diverted by the Project. As noted previously, a Technical Solution has been suggested to address water delivery to Diversion 73.

Air Quality and Greenhouse Gases

The loss of a clean energy source was a concern raised by some of the commenters.

Biological Resources

The following are comments related to biological resource impacts:

- inaccuracies in the characterization of steelhead habitat within the South Cow Creek watershed
- removal of critical water supply would affect the riparian habitat of Hooten Gulch
- abundance of wildlife including several migratory bird species use forebays
- water temperature issues overlooked by prior EIS
- biological resource studies as well as the US Fish and Wildlife Services Biological Opinion were deficient

Cultural Resources

There are a number of comments that relate to perceived inaccuracies of the cultural resource studies prepared in support of the FERC EIS. Several commenters dispute the finding that many facilities lack historical significance, such as the Kilarc Main Canal. Local significance was not addressed.

Hazards and Hazardous Materials

Comments related to hazards include the potential attraction (displacement) of dangerous wildlife in proximity to residences due to the loss of Kilarc Forebay. Other concerns include the loss of Kilarc Forebay as a source of fire water for helicopter fire-fighting in the area and possible contaminant releases from impounded sediments that would be allowed to flow downstream after dam removal.

Hydrology and Water Quality

Comments related to hydrology and water quality focus on the lack of accurate geomorphic studies that address the removal of Project facilities. Other key issues include water quality impacts (sediment transport) related to both the release of sediments currently impounded (see above) and due to increased erosion from the removal of Project facilities. Water rights were also a major topic of concern for many local residents who would be affected by the removal of Project facilities, specifically Diversion 73.

Recreation

The loss of recreational opportunities from the removal of Kilarc Forebay was of concern to many local residents. Many comments addressed the accessibility of the site and the high quality aesthetic viewing experiences afforded to visitors. Additionally, comments addressed the loss of fishing as a recreational opportunity due to decommissioning activities at Kilarc Forebay.

The matrix below includes a more detailed summary of comments. Comment letters and emails are included in their entirety in Appendix C as are oral comments in Appendix D.

Table 1. Scoping Comment Summaries Table

Name	Description	Date of comments	Comment summary	CEQA Issue Area
Written Responses to the NOP				
Public Agencies				
1- Shasta County	Response to NOP letter	4/20/2013	All Alternatives analyzed by FERC should be included in the CEQA process record. A list of supporting documents is provided as Attachment A.	Alternatives
			Proposals and options such as maintaining the Kilarc Plant and decommissioning the South Cow Plant, land trades, mitigation, and acquisition put forward by the Coalition should be considered. Comments from staff at the resource agencies stated that they would not accept any alternative that retained hydro power. The agencies made a decision and signed the 2005 MOU to decommission the entirety of the FERC Project 606 without offering the adjoining and affected land owners, and water right holders a place at the table. The MOU should have included landowners and water rights holders as signatories and any revised or re-established MOU should include members of this Coalition.	Alternatives
			Coalition requests that the SWRCB instruct FERC to add conditions reconsider and redraft the FEIS; and adopt SWRCB recommendations as a condition.	General
Project Proponent				
2- PG&E	Response to NOP letter	4/22/2013	Offers clarification on intent of decommissioning related to restoration of pre-project conditions. For example, removing a dam abutment may increase erosion potential, if so, the decommissioning plan proposes to leave it in place.	Project Description
			Clarification that No Project Alternative should not state hydroelectric facilities will continue to operate indefinitely under annual license renewals.	Alternatives
			PG&E is unclear why the NOP states "the EIR will include an analysis of the combined effects of Alternatives 1 and 2 to assess cumulative impacts of the proposed alternatives". PG&E is unclear how the combining of the 2 alternatives can be considered a cumulative analysis and if so, the EIR should substantiate why these 2 alternatives in combination are being considered "probable future projects".	Alternatives and Cumulative Impacts

Name	Description	Date of comments	Comment summary	CEQA Issue Area
Landowners/Local Residents				
3-David Albrecht - Letter 1	Response to NOP letter to State Water Board, with five attachments (below)	4/19/2013	The LSA PM&E's are deficient; sediment must be addressed in any dam removal. PM&E GEOL-3 calls for Professional Engineering Design Plans, and Specifications Mitigation, and Enhancement Plan. A Specification and Objectives phase should be accomplished first and subject to review.	Mitigation measures, Geology, Hydrology and Water Quality, Alternatives, Cultural Resources,
			Suggests additional efforts to perform a pre-dam/ post dam geomorphology study.	Hydrology
			Suggests bank restoration and stabilization at the diversion on South Cow Creek.	Hydrology, Geology, Hazards
			Suggests design specifications for channel restoration to resemble pre-dam conditions to be implemented as part of decommissioning.	Hydrology, Geology
			Cultural reports completed for the DEIS are perceived as not being accurate and that the removal of project features without accurate cultural studies is problematic.	Cultural Resources
	Attachment I - South Cow Creek site plan		For exhibit/illustration	
	Attachment II - Comments on South Cow Creek Dam {Sediment} Geomorphic Assessment, North State Resources, 05/20/2008		The South Cow Creek Dam Sediment Geomorphic Assessment focuses primarily on sediment and has limited information on channel geomorphic assessment. Several comments were made on stream geomorphic data presented in the study and the report data not supporting the findings in the report.	Hydrology and Water Quality
	Attachment III - Steps to Preparing Alternative Sediment Management Plans		Suggested use of ASCE 10 step dam removal checklist.	Hydrology and Water Quality
	Attachment IV- Letter to FERC, 07/07/2009		PM&E measures are not yet comprehensive and complete.	All Sections
			Suggests that additional review is required.	All Sections
			Suggests a general overview meeting with all parties involved followed up by a more detailed technical workshop and close with a wrap-up meeting to get input from all parties.	General Comment
			Suggests a technical workshop would be most effective if all key agencies represented had more than one representative with relevant expertise.	General Comment

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Primary objective of workshop should be to ensure all technical objectives and desired outcomes are well defined and supported by sound data analysis.	General Comment
	Attachment V- Letter to FERC with attachments, 08/19/2010- Comments on DEIS		Make sure discussions are consistent in terms of either separating or grouping discussions on the Kilarc versus Cow developments.	Project Description and All Sections
			DEIS is seriously deficient - does not convey that it has been developed in an impartial way.	All Sections
			The DEIS has a very short list of additional environmental measures which seems short compared to the list of environmental issues raised by many.	Mitigation Measures
			It seems as though FERC staff has taken the position that all reports are accurate without verification.	All Sections
	Attachment I		A valid geomorphic analysis needs to be undertaken to support the infrastructure removal at the Cow Creek Diversion Area.	Hydrology and Water Quality
	Attachment II		Action Alternatives are not defined or qualified very well. These Action Alternatives were not anticipated by anyone in Shasta County.	Alternatives
			Historic surveys are substandard and inaccurate. The DEIS regurgitates the Cultural report and SHPO documents.	Cultural Resources
			Suggest an overall need for improved veracity.	All Sections
			Suggests revised text in DEIS section 3.3.8.2 regarding the need to have a valid geomorphic analysis, achieving stable fish passage and goals of resource agencies. Increase bank stabilization.	Hydrology and Water Quality and Biological Resources
			Non-PG&E land owners do not have water rights associated with the existing PG&E water delivery system or the water rights associated with the ADU diversion.	Water Rights
	Attachment III		DEIS Tables 1 and 2 should include a column for Recommendations not just Comments/Protests. There does not appear to be acknowledgement or adoption of recommendations.	General Comment
			Accuracy and veracity of GANDA cultural reports is questioned.	Cultural Resources
			Questioning whether the intensive pedestrian cultural survey was done appropriately.	Cultural Resources

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Specific comments on the report include the issue of the report stating the diversion structure surveyed by Shoupe in 1989 was in the same condition as it was in when recorded. The diversion structure was removed and replaced the same year as the Shoupe survey. The timber crib structure which was replaced by the concrete capped crib dam does not resemble what was there before.	Cultural Resources
			The cultural section of the DEIS only cites the cultural reports and does not cite scoping comments	Cultural Resources
	Attachment IV		Overall concern and comments on accuracy of DEIS text.	All sections
			Correction on number of barriers on the South Cow Creek- DEIS says 9, but commenter is suggesting there is another barrier as well within Wagoner Canyon.	Project Description
			Hooten Gulch is not referenced correctly in terms of its hydrology and connection to South Cow Creek.	Project Description
			Physical state of a variety of areas is not accurately described.	Project Description
			Why isn't Cow Creek Geomorphic Report cited in Section 5.0 when the Kilarc Geomorphic report is?	References and Hydrology
			Factors other than impounded sediment and transport should be analyzed as it relates to dam removal.	Hydrology and Water Quality
			FERC doesn't appear to have a simple amendment or update process to correct errors in documentation.	All Sections
			Recommends setting clear objectives in the document.	All Sections
4-David Albrecht - Letter 2	Response to NOP Letter to State Water Board	4/21/2013	Recommended referring to the Biological Evaluation Document (FERC 200908257-5009) in addition to the LSA, FERC EIS, and other documents in the CEQA process.	Biological Resources
			Section 1.1 on Regulatory Overview of BE Document seems to be an excellent summary of various past Process stages, and the CEQA stage now beginning.	Project Description
			Section 1.2 Project History of BE Document is also very informative, especially the conclusion of the first paragraph.	Project Description
			Commenter disagrees with Section 2.3.1.1, page 2-4, on Avoidance and Minimization Measures sub-paragraph 2) which states that "It is estimated that up to 400 feet of stream channel may need to be dewatered to remove the dam and excavate the pilot thalweg channel…"This number seems to be off by about a factor of 2X as I can't possibly conceive of why one would dewater more than 200 to 225 feet of creek to remove this structure.	Mitigation Measures

Name	Description	Date of comments	Comment summary	CEQA Issue Area
5- David Albrecht - Emails	Email	4/22/2013	Provided suggestions on good pictorial overview of South Cow Creek in Wagoner Canyon.	Project Description and Setting for Hydrology and Water Quality
	Email	4/21/2013	Please make use of information in FERC filings {FERC# 20120808-0021}, [FERC # 20120820-5084} and {FERC #10121009-0009} when addressing and assessing the impacts of the License surrender on the German Ditch water users.	All Sections
	Email	4/20/2013	Suggestion for re-wording the first two sentences in the 3rd paragraph of FERC AA2. "The South Cow Creek diversion dam and canal intake would be modified as necessary to provide to the main canal any available flow; after CDF&W bypass requirements are satisfied, up to 13.13 cfs, which is the limit of ADU right during the irrigation season. All flows in excess of that would be released to the South Cow Creek bypassed reach below the diversion dam. The Hooten Gulch."	Project Description
	Email	4/20/2013	If CEQA review involves use of AA2, commenters suggest review of FERC wording set forth on pages 35 and 36 of the EIS.	Project Description
			SWRCB should maintain neutrality.	General Comment
			If the SWRCB is going to use AA2, recommends there be a well thought out "water rights qualifying paragraph" after the now existing 3rd paragraph stating "Per the standing 1969 Cow Creek Decree, the only water diversion allowed at the SCC diversion in the South Cow Group is a 3rd priority non consumable one for power generation. It is presumed under this Alternative that the necessary process would be undertaken through the Superior Court of Shasta County to modify the Decree to permit the Abbott right in a manner that did not promote nor harm their existing water right; or those of others."	Project Description
			Suggest adding to the FERC AA2 paragraph 3 additional text, “Per the standing 1969 Cow Creek Decree, the only water diversion allowed at the SCC diversion in the South Cow Group is a 3rd priority non consumable one for power generation. It is presumed under this Alternative that the necessary process would be undertaken through the Superior Court of Shasta County to modify the Decree to permit the Abbott right in a manner that did not promote nor harm their existing water right; or those of others." Revise the sentence in the fourth paragraph to begin as follows: “Land right easements, access and maintenance agreements would need to be developed with private landowners… Penstock.”	Project Description

Name	Description	Date of comments	Comment summary	CEQA Issue Area
6- James Fletter	Response to NOP letter	4/15/2013	Provided exhibits including legal description and judgment regarding PG&E rights on their property.	Project Description
			Provided an easement in Exhibit B for the Cow Creek Forebay Easement. Noting there is nothing implicit giving PG&E any right to fill the forebay or otherwise destroy or remove it on their property.	Project Description
			Provided an easement in Exhibit C which states that the canal can be replaced by a pipeline but that there is no provision for the removal of an open canal which is not a pipeline.	Project Description
			Provided an easement in Exhibit D which allows for the removal of pole line improvements on their property.	
			Provided an easement in Exhibit E for project access roads, PG&E has no right to take any part of the access road on their property.	Project Description
			Exhibits B, C, or E do not allow for removal or destruction of improvements on their property. In addition, the exhibits do not allow for original construction and are non-exclusive	Project Description
			The ownership of the improvements for the forebay, the canal and road easement are not held by PG&E. PG&E only has the right to maintain and use and if necessary reconstruct them but cannot destroy or remove them with the exception of the pole line.	Project Description
			Recommends considering property rights in the EIR.	All Sections
7- Jim Hamilton via Kelly Sackheim	Response to NOP Email	4/22/2013	Fishing is very important. Was told that Kilarc Lake was the best fishing in the Redding area and possibly a state record trout was caught there. Fish caught there are very healthy.	Recreation, Access, Hazards
			Kilarc has great access and he can take his elder family members there easily.	Access and Recreation
			It is clean and beautiful and has good populations of fish.	Recreation and Biological Resources
			Safety could be improved with cameras to make it safer for old people and females including Grace Lake.	Hazards
			There is good fly fishing at Kilarc.	Recreation
8- Eric Poole	Response to NOP letter with attachments including synopsis of Project 606 FERC Filings, Halpin decision, 1965 Cow Creek Adjudication and 1969 Decree	4/22/2013	Water quality is critical to his own and neighbor's use and any possible impact to water quality could affect them.	Hydrology and Water Quality

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			The impounded sediment behind the dam has accumulated for a long time and sediments could also include those from mining which may have been unregulated.	Hazards and Water Quality
			Thorough testing of the impounded materials should occur if the dam is removed to ensure no degradation of water quality in South Cow Creek.	Hazards and Water Quality
			Continuous monitoring should occur of the dam is removed to ensure water quality is maintained.	Hazards and Water Quality
			Water quality is a health issue.	Hazards and Water Quality
			The adjudication states that no member of the adjudication is allowed to take any action, direct or indirect, that will obstruct or interfere with the rights of the other parties to the adjudication.	Water Rights
			The Abbott Ditch is a party to the adjudication and PG&E's plan contemplates removal of the diversion structure on South Cow Creek, therefore, their rights can be interfered with.	Water Rights
			Removal of diversion structure should be removed from Plan and Alternatives.	Alternatives
			Alternatives should be developed that respect the adjudication and then work toward releasing PG&E from their license.	Alternatives
			No Action Alternative must ensure that the current decreed water supply remains in place.	Alternatives
			Many alternatives proposed by the public in the past were dismissed through the FERC process without warrant.	Alternatives
			Time to reconsider all alternatives including one proposed by Tetrick Ranch.	Alternatives
			SWRCB should take a closer look at the Tetrick Ranch, Shasta County, Evergreen Shasta Power and Sierra Pacific coalition provided alternative.	Alternatives
			FERC did not consider the consequence of removing the water supply from Diversion 73 as part of the decommissioning plan.	Water Rights, Agriculture
			By removing the water supply for Diversion 73, year round ranching is eliminated which would result in the cessation of certain ranches and their respective livelihoods.	Water Rights, Agriculture
			Diversion 73 also provides domestic water supply to several households in Cow Creek Valley and there are no other sources of water through wells in the area.	Water Rights, Agriculture

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			These effects would destroy lifestyles and livelihoods of many residents in the valley and FERC ignore these impacts and SWRCB has the opportunity to rectify this.	Water Rights, Agriculture
			Most agencies have assumed environmental benefits from decommissioning but no agency has assessed impacts to the entire ecosystem in South Cow Creek Valley and Hooten Gulch.	Biological Resources, Hydrology and Water Quality
			The removal of critical water supply would affect the riparian habitat in Hooten Gulch and South Cow Creek Valley.	Biological Resources, Hydrology and Water Quality
			If the destruction of the ecosystem is carried forward, the mitigation must be measured and estimated where measurement is not possible.	Mitigation Measures- All Sections
			Hooten Gulch needs to be looked at as a natural watercourse and must be treated as such when assessing impacts from the decommissioning plan.	Hydrology and Water Quality
			Disagrees with the disposition of PG&E's water rights in terms of existing versus post decommissioning.	Hydrology and Water Quality
			The agencies that directly advocate for the decommissioning plan as it stands in its draft form (and the FERC through its refusal to address any public concerns in its draft and final EIS) have repeatedly ignored public concerns over water rights, fire suppression, disabled access to recreation (including citation of the ADA act) and environmental impacts.	Hazards, Access, Recreation
			Public comments were not addressed in the EIS process and there is concern that the public is running out of opportunities to have their concerns addressed and will be left with only legal challenges to the entire process.	All Sections
9- RJ Roth via Bob Whitmore	Email	4/18/2013	Submission of signed petition stating "We the stakeholders in the PG&E P-606 Kilarc-Cow Creek license surrender proceeding support the preservation of Kilarc Reservoir and the rest of the PG&E's infrastructure that can be repurposed if not dismantled."	Alternatives
10- Kelly Sackheim - Email 1	Todd Wroe comment and Wroe objection letter (2009)	4/12/2013	Kilarc Reservoir is a source of clean and efficient power.	General Comment
			Kilarc Reservoir is a community landmark for the community of Whitmore.	Cultural Resources
			Supports other public commenters and suggests leaving the facilities in place. Feels that stakeholders have been ignored by PG&E.	Alternatives

Name	Description	Date of comments	Comment summary	CEQA Issue Area
11- Kelly Sackheim - Email 2	Email with attached prior FERC License Surrender Application comments (2008 & 2009)	4/12/2013	Prior letters submitted with issues not adequately addressed by FERC.	All Sections
	Attachment 1 - 11/07/2008 Whitmore Community Stakeholders letter, including comments of Whitmore Community Stakeholders raised at October 29, 2008 meeting (attached to Attachment 1)		Decommissioning Plan did not take any community comments into account during preparation.	Project Description
			Community and Davis Hydro are prepared to take responsibility for the facilities.	Alternatives
			Suggests that PG&E donate the facilities rather than spend money to destroy it.	Alternatives
			From the Project, there would be significant unmitigated effects as follows:	Resources Sections
			Loss of local recreation that is especially suitable for youth and handicapped.	Recreation
			Destruction of a historic resource.	Cultural Resources
			Water supply impacts from loss of groundwater recharge to springs and wells.	Hydrology
			Loss of fire suppression capability puts our community and natural resources at risk.	Hazards
			Downstream water quality impacts on endangered fish.	Water Quality and Biological Resources
			Impacts to wildlife and natural resources, including wetlands and potentially endangered species.	Biological Resources
			Potential hazard of dangerous wildlife seeking water on residential and ranch properties.	Biological Resources
			Deterioration of local economy and property values with disruption to ecological balance and community benefits that have evolved over 100 years with the project.	Population and Housing
			Does not believe that steelhead trout would benefit since they have never been seen there.	Biological Resources
			Include additional stakeholders name's in the DLSA.	General Comment
			Difficult to establish PG&E's rationale for dismissing significant issues.	All Sections

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Community stakeholders recommend addressing the Kilarc development separately from the South Cow and group for each topic issue the discussions of affected environment, impacts, and mitigations, with all corresponding tables and figures.	Alternatives and All Sections
			No study on groundwater has been conducted since 1984 and results found that it was marginal.	Hydrology and Water Quality and Geology and Soils
			The spillway no. 3 is not depicted correctly on PG&E's maps and it is not possible to analyze hydrology effects using incorrect maps.	Hydrology and Water Quality
			The impacts to community wells are a direct project effect that must be assessed and to “consult” with well owners does not mitigate the problem.	Hydrology and Water Quality
			Reduction of groundwater recharge and yield of springs and wells upon which residents depend could occur due to removal of the Kilarc canal and reservoir and must be characterized as a potentially significant adverse effect for which mitigation must be defined.	Hydrology and Water Quality
			Reduction of groundwater recharge could also result in a secondary effect of subsidence, a potentially significant adverse effect on ground stability.	Hydrology and Water Quality, Geology and Soils, Hazards
			Reduction of groundwater recharge could also result in a secondary effect on natural resources, including old growth trees and wetlands, a significant adverse effect on habitat.	Hydrology and Water Quality, Biological Resources
			The Kilarc Reservoir is a water resource available for helicopter bucket refilling to suppress wild land fires in the area. The local fire company supports retention as this has helped in controlling numerous fires. Removal of the Kilarc reservoir must be characterized as a significant adverse effect for which mitigation must be defined.	Hazards
			Water temperature changes from decommissioning will affect aquatic biota downstream.	Biological Resources
			Dispute the assertion that steelhead critical habitat exists upstream of Whitmore Falls.	Biological Resources
			Disputes the assertion that leaving project facilities in place would trigger thresholds for fish mortality and fish passage.	Alternatives and Biological Resources
			Dismantling of Kilarc Forebay would exceed the threshold for "cause a substantial loss of foraging or breeding habitat.	Biological Resources
			Bigscale balsamroot does not come up in CNPS searches for quads in the project area and would represent a significant habitat extension.	Biological Resources

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Migratory Birds and other wildlife use Kilarc Forebay and elimination of it must be characterized as significant.	Biological Resources
			Whitmore is an attractive place to live because of diverse wildlife.	Recreation
			Bats must be flushed out of the tunnel before it is closed.	Biological Resources
			Change in the existing environment will result in a potentially significant impact.	All Sections
			Cultural reports mischaracterize resources.	Cultural Resources
			LSA should be revised to address historical resources separately from archaeological resources.	Cultural Resources
			Kilarc powerhouse was the 3rd in the County and is historically important to the development of Shasta County.	Cultural Resources
			Kilarc main canal does not appear to be one of the 7 architectural and historical resources identified in the cultural report.	Cultural Resources
			Community values the features associated with the development and the cultural report does not reflect this.	Cultural Resources
			Community requests a comprehensive revision of the cultural report and its findings.	Cultural Resources
			The existence of the Kilarc Forebay makes the community more attractive and adds value to the town. Removal will result in traveling farther to enjoy outdoor activity.	Recreation
			PG&E is unable to implement the PM&E Measure Rec-2.	Recreation
			Proposed mitigation related to removal of Kilarc Forebay as a recreational resource is inadequate.	Recreation
			Views from the path along the canal and the public views of the 3 mountain ranges from the Forebay are refreshing.	Aesthetics
			Not enough Key Observation Points (KOPs) were evaluated such as views from the path along the canal.	Aesthetics
			There would be significant impacts to recreationists who would no longer be able to view such surroundings.	Aesthetics
			Mountain lions and other predators may seek ponds on grazing or residential properties. This is not mentioned in the DSLA.	Hazards and Biological Resources
			Loss of Kilarc Forebay as a source of water for helicopter bucket refilling related to fires is a significant adverse effect.	Hazards

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			The Stewardship Council recommends leaving facilities in place. Dismantling them would result in significant conflict with their recommendations and objectives.	Alternatives
			Area and trees will dry up without project.	Biological Resources and Hydrology
			Seep provides spring supply may disappear after they shut it off.	Hydrology
			No way for fish to go upstream and therefore removing project will facilities not achieve anything.	Biological Resources
			Wildlife seeking ponds which is a hazard to residents.	Biological Resources
			Kilarc provides possible habitat for raptors such as eagles and osprey. Osprey nests have been seen there.	Biological Resources
			Displacement of bats is an issue.	Biological Resources
			Whitmore provides a wildlife "restaurant" for migratory birds.	Biological Resources
			Bald Eagles, Golden Eagles and Peregrine Falcon are located nearby.	Biological Resources
			Not good habitat for steelhead trout.	Biological Resources
			Kilarc is key in groundwater recharge for several properties.	Hydrology
			Concern for subsidence.	Geology and Soils
			Without Kilarc, it forces people to go further for recreational opportunities.	Recreation and Traffic
	Attachment 2- Statutory Background for Requiring EIS Letter to FERC 03/01/2009		Addresses level of analysis under NEPA "FERC's regulations provide that an EIS must be completed for major federal actions that significantly affect the quality of the human environment" and lists impacts to be considered. Also suggests alternatives presented are limited to small variations on the proposed action and should be expanded.	NEPA process and Alternatives
12- Kelly Sackheim - Email 3	Email with attachments - Cultural Resources Comments (2010 & 2011)	4/12/2013	PG&E's analysis accepted by FERC includes a grossly distorted assessment of the project cultural resources. The email attachments detail the concerns related to cultural resources.	Cultural Resources

Name	Description	Date of comments	Comment summary	CEQA Issue Area
	Attachment 1 - Letter to Advisory Council on Historic Preservation 3/26/2010		PG&E's analysis accepted by FERC includes a grossly distorted assessment of the project Cultural Resources. The Project includes 23 distinct features that are in sufficiently good condition to depict the area's history and should not be deemed invaluable "due to their lack of integrity." Also, it is possible that the first section of the diversion was originally a headrace for a hydraulic mining operation. The revised analysis should reconsider these points and determine that demolition is not a necessary condition of PG&E's license surrender.	Cultural Resources
	Attachment 2 - Letter to FERC, 11/21/2011		The comment requests collaboration with the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officer (SHPO) to intervene and even lead to the reversal of a FERC Order to irreversibly modify an historic facility, so that an historic hydroelectric facility could be restored to operation.	Cultural Resources, Alternatives
13- Kelly Sackheim - Email 4	Anadromous Fish Passage Comment	4/12/2013	The resource agencies allege that more habitat in the Kilarc by-pass reach is necessary to accommodate steelhead that have never been observed upstream of Whitmore Falls, but "MIGHT be able to arrive based on a 2002 memo. However, the memo doesn't provide a good argument for revising the assumption that Whitmore Falls is an impassable barrier." There is a lack of evidence on how much habitat would be created by increasing the flow by up to 50 cfs that is the Kilarc Canal's capacity. There is also a lack of data on whether resident thought would also benefit from additional habitat upstream of the impassable barrier.	Hydrology, Aquatic and Fisheries Resources
14- Kelly Sackheim - Email 5 w/attached new comment letter	CEQA Scoping Comment, response to NOP letter, Proposed Condition #1 attached	4/12/2013	The Water Board may consider attaching the following to every alternative that may be considered for authorization by the FERC: "Mandatory Condition: Water quality downstream of the Kilarc Development shall be maintained to preserve habitat in support of the recovery of anadromous fish species of concern." The objective is to avoid degradation of the known anadromous fish habitat in Old Cow Creek downstream of Whitmore Falls and the main stem of Cow Creek. Reasonable alternatives must not be excluded, and there must be adequate studies upon which to base water quality certification.	Water quality, Alternatives
			There must be an adequate foundation of studies and analysis upon which the water quality certification will be based.	All Sections
			Reasonable alternatives must not be excluded.	Alternatives

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Draft mandatory conditions of water quality certification to be issued at the same time as EIR.	
15- Kelly Sackheim - Email 6	Preliminary Permit Information - Email and attached Initial Statement	4/18/2013	The construction impacts associated with the dismantling of PG&E's canal, in addition to the construction of new facilities for the proposed open channel turbines would be an unnecessary adverse environmental effect, allowing PG&E to destroy a facility in lieu of allowing future beneficial re-use. The Water Board should consider attaching the following: Water Board consider attaching the following: "Mandatory Condition: Impacts of dismantling of PG&E's canal and construction of substitute facilities for reasonably foreseeable future beneficial use of the water resource shall be avoided by allowing facilities to be recommissioned rather than dismantled."	Alternatives
			The email includes as attachments an Initial Statement/Application for Preliminary Permit for the Old Cow Creek Open-Channel Turbines Hydro Project and a copy of FERC's Order on Rehearing, Issued April 18, 2013.	Alternatives
16- Kelly Sackheim - Email 7	Email with Dick Ely Davis Hydro Alternative synopsis letter attached	4/19/2013	The comment requests consideration of the Davis Hydro Alternative as a viable alternative and presents a schematic description as a template for a Davis Hydro License to operate in Project P-606. Davis Hydro has an interest in operating only the Kilarc facility as a profit-making entity that will provide significant fisheries and community benefit for the area.	Alternatives
17- Bob Stanton	Email and attached response to NOP comment letter and attached file Tetrick-ADU_Technical_ Solution	4/21/2013 (04/17/2013)	Hopes that State Water Board includes the interests of the Abbott Ditch Users in the 401 Water Quality Certification.	All Sections
			Concerned about their water right as an Abbott Ditch user and will be watching the CEQA process closely.	Agricultural Resources
			No action on the project should be taken until the water rights of downstream users is protected and maintained.	Water Rights
			If the ranchers are forced to bear the financial burden to maintain a pump station, pay for power to operate the pumps, and maintain the Abbott Ditch post decommissioning, their ranches would not be sustainable and it would render ADU's water rights worthless.	Water Rights, Agriculture
			Other points of diversion would be too costly and may not be technically feasible.	Alternatives

Name	Description	Date of comments	Comment summary	CEQA Issue Area
	Technical Solution Outline	4/20/2013	Suggests an alternative to the loss of water in the Abbott Ditch by re-establishing 1,200 feet of the historic east channel of South Cow Creek so that it flows into Hooten Gulch and continues to provide water. Details are located in the letter.	Alternatives
18- Heidi Strand	Letter	4/18/2013	Cumulative and comprehensive impacts were not considered well in the EIS. For example, loss of Abbott Ditch results in loss of water for animals and plants over the long term.	Cumulative Impacts
			FERC's scope of alternatives was inadequate.	Alternatives
			Suggests that the following mandatory condition should be in place: Impacts of dismantling of PG&E's canal and construction of substitute facilities for reasonably foreseeable future beneficial use of the water resource shall be avoided by allowing facilities to be recommissioned rather than dismantled.	Alternatives
			Salmon have never been seen over Whitmore Falls but steelhead trout was ignored in the EIS. Steelhead live in Kilarc Lake, Old Cow Creek and South Cow Creek. A thorough Steelhead study is necessary.	Biological Resources
			PG&E should be denied its License Surrender Application and should not be able to abandon their water rights without an “in place” physical solution to water delivery to the Wagoner Ranch.	Agricultural Resources
			Costs of permitting and constructing new diversions on private lands in 2013 are much different, if not impossible, than in 1904. The land owners that have invested in the South Cow Creek Valley have done so in reliance and dependence on the water delivery system that has been in place for over a century.	Agricultural Resources
			Both the Tetrick Ranch and the ADU have developed a proposed solution, “Technical Solution” (TS), for water delivery to Diversion 73 in the event the Project is to be decommissioned. Details are provided in the letter.	Alternatives
19- Tetrick Ranch, Steve and Bonnie Tetrick	Response to NOP comment letter and appendices: Indenture Wagoner-Smith 1907; Smith - Notice of Appropriation -1907; 1965 California State Water Board Study, Page A-90 excerpt; 1965 California State Water Board Study; 1969 Adjudication; and, April 2013 Technical Solution	4/20/2013	It is important to understand the significance of the Projects history. Before a decision is made to undo what has become a natural “part of the environment”, it is vital to understand who, when, how, and why certain things were done in the first place. PG&E’s non consumptive water rights were established by earlier agreements with its predecessors. PG&E should be denied its License Surrender Application and should not be able to abandon their water rights without an “in place” physical solution to water delivery to the Wagoner Ranch.	Alternatives

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Costs of permitting and constructing new diversions on private lands in 2013 are much different, if not impossible, than in 1904. If Wagoner understood that PG&E could cut and run at any time, turn off the water and leave their transmission lines and wires, he would have not agreed to sell his land and would have required the utility to construct a sustainable diversion somewhere else. Additionally, the land owners that have invested in the South Cow Creek Valley have done so in reliance and dependence on the water delivery system that has been in place for over a century. It appears that the landowners of the South Cow Creek valley were misled by the public utilities and the agencies over the past 100 years and during the 1969 Adjudication process because it was never assumed that the Diversion 64 would be removed.	Alternatives
			Tetrick Ranch and the ADU have developed a proposed solution, "Technical Solution" (TS), for water delivery to Diversion 73 in the event the Project is to be decommissioned and is requesting that the CSWRCB hold a mandatory settlement conference with the parties required for approval on or before June 1, 2013. TS is a pragmatic solution and would cost an estimated $2.5-million to complete all phases. TS should be included as a part of any FERC surrender order. In the absence of agreement, SWRCB should notify FERC that it requests, that PG&E be required to construct and pay for such a Technical Solution or its equivalent such that the water users are not adversely affected. Furthermore, it is essential that the resource agencies agree in advance that they will entertain such a resolution and promptly process the TS. Finally, PG&E should be required to take all steps necessary to assure that the water users continue to enjoy the uninterrupted and continuous water deliveries to their homes and properties to avoid economic harm. The proposed project would re-establish approximately 1,200 feet of the historic east channel of South Cow Creek so that it once again flows into Hooten Gulch and continues to provide water to the historic and current Abbott Diversion. This solution also maintains flow in an additional 1,200 feet (approximately) of Hooten Gulch downstream of the confluence of the restored east channel that would be lost under the preferred alternative in the FEIS.	Alternatives
	Coalition comment letter	4/20/2013	All Alternatives analyzed by FERC should be included in the CEQA process.	Alternatives

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			Alternatives such as maintaining the Kilarc Plant and decommissioning the South Cow Plant put forward by the Coalition should be considered and seemed to be dismissed previously by resource agencies.	Alternatives
Written Comments Submitted at the Public Scoping Meeting				
Public Agencies				
SM 1-CDFW (previously CDFG)	Copy of scoping comment letter originally submitted 12/10/2009	Re-submitted 4/10/2013	The Department reiterates support of the decommissioning plan as described in the Surrender Application filed by PG&E to FERC.	General Comment
SM 2- NMFS	Copy of scoping comment letter addressed to Kimberly D. Bose, FERC, originally submitted 10/15/2009	Re-submitted 4/10/2013	Decommissioning remains the most viable alternative for maximizing benefits for anadromous fish.	Biological Resources, Alternatives Analysis
	Copy of comments regarding scoping site visits to Kimberly D. Bose, FERC, originally submitted 11/04/2009	Re-submitted 4/10/2013	NMFS states that Tetrick Ranch did not provide a substantial basis to convince NMFS that benefits are likely from the Tetrick Ranch alternative. Also Davis Hydro did not provide substantial new information for its alternative. NMFS maintains that a framework for decommissioning and restoration scenario for the Project is the most viable alternative for maximizing anadromous fish benefits.	Biological Resources, Alternatives Analysis
	Copy of comments, terms of conditions and motion to intervene letter addressed to Kimberly D. Bose, FERC, originally submitted 07/06/2009	Re-submitted 4/10/2013	Recommends that the LSA include terms and conditions to protect, mitigate damages to, and enhance fish resources. The conditions are consistent with PG&E's PM&E measures.	Mitigation measures
Landowners/Local Residents				
SM 3- David Albrecht	04/06/2013 comment letter with attachments	4/10/2013	Requests more precise diagrams and aerial overlays for the project area to document physical changes that have occurred since EIS issuance in 2011.	Project Area Description
			Requests resource agency review of any “Vegetation Management” request.	Biological Resources
			Concerned that the key geomorphic issues for the dam are very loosely and not appropriately defined, or well understood.	Geology and Soils

Name	Description	Date of comments	Comment summary	CEQA Issue Area
SM 4-Davis Hydro, LLC	Copy of 04/08/2011 letter to FERC to request restarting NEPA process, copy of 08/25/2010 DEIS comment letter to FERC attached	Resubmitted 4/10/2013	Requests that the following issues be addressed: no anadromy near the Kilarc project, water temperature and habitat destruction, long-term habitat destruction from fire, acid rains, replacement power construction, resident fish and habitat diminution, alternatives that Davis Hydro has suggested.	Biological Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Alternatives
	Summary of Davis Hydro proposal for an "Anadromous Fish Enhancement Project for the Old Cow Creek"	Resubmitted 4/10/2013	The document contains a summary of the Davis Hydro proposal for work at the Old Cow Creek, where Davis Hydro intends to create a public private partnership to help the fish, support the interests of the local community and to generate green power.	Alternatives
	03/22/2011 comment on the NMFS 2011 Biological Opinion	Resubmitted 4/10/2013	The Biological Opinion is deficient and excludes the following resource impacts: increased fire impacts on critical habitat, increased water temperature in critical habitat areas, increased fishing pressure on known existing endangered populations, construction effects of alternative power sources, delay in green power expansions, and delay in implementing constructive alternatives.	Biological Resources, Biological Opinion
SM 5- James Fletter	Court document (originally submitted to FERC during EIS scoping meeting October 22, 2009)	Resubmitted 4/10/2013	Clarifies the ownership of named defendants (including James Fletter) as owners in fee simple certain as well as PG&E non-exclusive easement and right of way for Cow Creek Forebay and access.	Project Area Description
SM 6- Heidi Strand	Copy of 01/20/2012 letter to FERC addressing water rights	Resubmitted 4/10/2013	Comments that Whitmore is an Environmental Justice community and the South Cow Creek Ditch Association (SCCDA) has been denied meaningful involvement in the permitting process and agreement regarding its water rights.	Hydrology and Water Quality, Land Use and Planning
Public Meeting Transcript (in Speaking Order)				
Bob Rynearson, Land Manager with Beaty & Associates	Public comment. Transcribed during meeting.	4/10/2013	If relevant, the EIR should address PG&E's agreement to surrender of water rights to the German Ditch Association. The EIR should not exclude the issue if it would result in German Ditch Association losing the water rights.	Land Use and Planning

Name	Description	Date of comments	Comment summary	CEQA Issue Area
Kelly Sackheim	Public comment. Transcribed during meeting.	4/10/2013	We look forward to alternatives that provide for future beneficial use of the resources by stakeholders. There is no evidence that alleged benefits will be obtained as a result of dismantling the facilities; there are, however, benefits of preserving the facilities. There are specific plans and entities committed to preserving the facilities for these benefits. The rush to dismantle facilities is unnecessary. Proposals to beneficially re-use the Kilarc Development facilities should be evaluated as alternatives. Mr. Sackheim and Mr. Ely, small hydroelectric power developers are proposing such an alternative. There is no reason to preclude FERC from authorizing a third party to resume generation of electricity (3 megawatts) with the same facilities. David Hydro has proposed implementation of an anadromous fish research facility. Permit application have been submitted for implementation of an open-channel turbines hydroelectric project in the Kilarc Canal. Glenn Dye established the Save Kilarc committee, and community members have shown support for maintaining the PG&E facilities. Saving the facilities would allow the following to continue: recreational fishing, source of water for firefighting and groundwater recharge, avoidance of habitat disturbance.	Alternatives
Betsy Bivin	Public comment. Transcribed during meeting.	4/10/2013	The EIS has errors, and the EIR should include more field-based findings. The community has knowledge of the area that could help in areas such as botanical resources. In regards to the EIS, there are inaccuracies under geologic and soil resources. Will downstream erosion be addressed in the EIR? Also, the final EIS did not address questionable cubic feet per second data under water resources. The EIR should address that fish will not get over the Whitmore Falls. The animal described in the EIS wildlife section as Mule Deer should be Columbia Whitetail. The EIR should address that the area is a migration area. There are also elk, raptors, Bald Eagles, and Osprey in the area. The EIS did not properly mitigate for loss of handicap access; Kilarc has some of the best handicapped access for wheelchair users in the area who fish. Archaeological sites, including one off of South Creek road, should be considered.	Biological resources, Geology and Soils, Hydrology and Water Quality, Aquatic and Fisheries Resources, Recreation
Dick Ely	Public comment. Transcribed during meeting.	4/10/2013	The EIS was deficient, poorly studied, and based on a deficient biological opinion. The Kilarc Project affects the water temperature. The site injects downstream cold water below the falls where there are multiple anadromous species; the need for cold water is a limiting factor that was ignored in the EIS.	Biological resources, Hydrology and Water Quality, Aquatic and Fisheries Resources,

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			The EIR should consider that the project area roads, fire barriers, availability of water at altitude are essential for maintaining a low level of fire prevalence in the area. Reduced fire prevalence increases the ability of fish to survive in the area. Combining Kilarc and South Cow into one area complicates the discussion. The Project should be split in half. According to the Kilarc Foundation, the best use of the facility is to set up an institution to serve the fish and community.	Hazards, Biological Resources Alternatives
David Albrecht	Public comment. Transcribed during meeting.	4/10/2013	The South Cow Diversion Works resides on the Albrecht family property by right of a deeded easement from 1907. The dam has experienced changes over the last two years since issuance of the EIS. David Albrecht plans to submit additional material on issues concerning dam removal. The CEQA document should have a checklist to identify errors and when and how they will be addressed. This is important with respect to physical infrastructure removal and creek areas.	Project description
William Farrell	Public comment. Transcribed during meeting.	4/10/2013	Mr. Farrell plans to submit a written form. There are nesting bald eagles on his property in South Cow Creek.	Biological Resources
Matt Myers, California Department of Fish and Wildlife (CDFW)	Public comment. Transcribed during meeting.	4/10/2013	CDFW still supports the 2005 MOU and the PG&E prepared surrender application and will be submitting comments on the draft EIR.	Biological Resources
David White, National Marine Fisheries Service (NMFS), Federal Energy Regulatory Commission (FERC) Coordinator and Fish Passage Engineer	Public comment. Transcribed during meeting.	4/10/2013	From the perspective of NMFS, the decommissioning plan is the best alternative for maximizing conservation benefits for anadromous fish.	Biological Resources
Erik Poole	Public comment. Transcribed during meeting.	4/10/2013	Consider that the no action alternative would be either the assumed presence of a new operator or a "ghost operator" (how the facility is currently operating).	No Action Alternative, Hydrology, Public Service

Name	Description	Date of comments	Comment summary	CEQA Issue Area
			FERC ignored the fact that the project is in a fully adjudicated watershed and impacts to other parties of the adjudication. The State Water Board wrote a water use and supply report the informed the adjudication, which stands today and should be considered into the project scope. Foreseeable impacts from the proposed decommissioning plan should be considered, not just those listed within the plan. If you no longer divert water form Old Cow or South Cow, all of the environment along the existing canals, around the forebays, and any tailrace is significantly impacted along with any ongoing use of that water. Several hundred acres on or adjacent to the South Cow Project would be severely impacted.	Hydrology, Public Service

Kilarc-Cow Creek Hydroelectric
Power License Surrender Project
Water Quality Certification EIR

APPENDIX A

NOTICES

PUBLIC NOTICE FOR
CLEAN WATER ACT 401 WATER QUALITY CERTIFICATION
BEFORE THE DIVISION OF WATER RIGHTS

An application for water quality certification under section 401 of the Clean Water Act for the following project was filed with the State Water Resources Control Board (State Water Board), Division of Water Rights (Division). California Code of Regulations, title 23, section 3858 requires the Executive Officer of the State Water Board to provide public notice of an application at least twenty-one (21) days before taking certification action on the application. Written questions and/or comments regarding the application should be directed to:

Water Quality Certification Unit
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RECEIVED:	August 18, 2009
PROJECT:	Kilarc-Cow Creek Hydroelectric Project, Federal Energy Regulatory Commission Project No. 606
APPLICANT:	Pacific Gas and Electric Company
COUNTY:	Shasta
RECEIVING WATER:	Kilarc-Cow
PUBLIC NOTICE:	September 15, 2009
PROJECT STATUS:	Pending Certification Action

PROJECT DESCRIPTION:
The Pacific Gas and Electric Company (PG&E) has proposed to decommission the Kilarc-Cow Creek Hydroelectic Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 606. The decommissioning process for this Project is described in the License Surrender Application that PG&E sent to FERC on March 12, 2009. PG&E intends to remove all Project features, including canals, forebays, and instream diversion dams. After the Project features are removed, PG&E intends to restore the portions of Kilarc and Cow Creeks that were affected by the Project to maximize fish passage and spawning opportunities, provide streambed stability, and restore riparian vegetation.

NOTICE OF PREPARATION AND SCOPING MEETING FOR AN ENVIRONMENTAL IMPACT REPORT

KILARC-COW CREEK HYDROELECTRIC PROJECT LICENSE SURRENDER

NOTICE IS HEREBY GIVEN THAT the State Water Resources Control Board (State Water Board) will be preparing an Environmental Impact Report for Pacific Gas and Electric Company's (PG&E) Kilarc-Cow Creek Hydroelectric Project License Surrender (Project), Federal Energy Regulatory Commission Project No. 606. Additionally, State Water Board staff will be holding a public scoping meeting at the time and location below to collect comments on the Project. The Notice of Preparation (NOP) may be viewed at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml

Public Scoping Meeting
Wednesday, April 10, 2013 – 6:00 p.m.
Millville Grange
20237 Old 44 Drive
Palo Cedro, CA 96073

SUBMISSION OF COMMENTS

Written comments on the NOP are due by **Noon (12:00 PM) on Monday, April 22, 2013,** and should be addressed to Mr. Jeffrey Parks at the address below. Oral comments must be made at the public scoping meeting.

Comment letters may be submitted electronically, in pdf text format (if less than 15 megabytes in total size), to Jeffrey Parks via email at jparks@waterboards.ca.gov. If the file is greater than 15 megabytes in total size, then the comment letter may be submitted by fax at (916) 341-5400. Please indicate the subject line: **"Comment Letter – Kilarc-Cow NOP."** Couriers delivering hard copies of comment letters must check in with Cal/EPA Building lobby security personnel, who can contact Mr. Parks at (916) 341-5319.

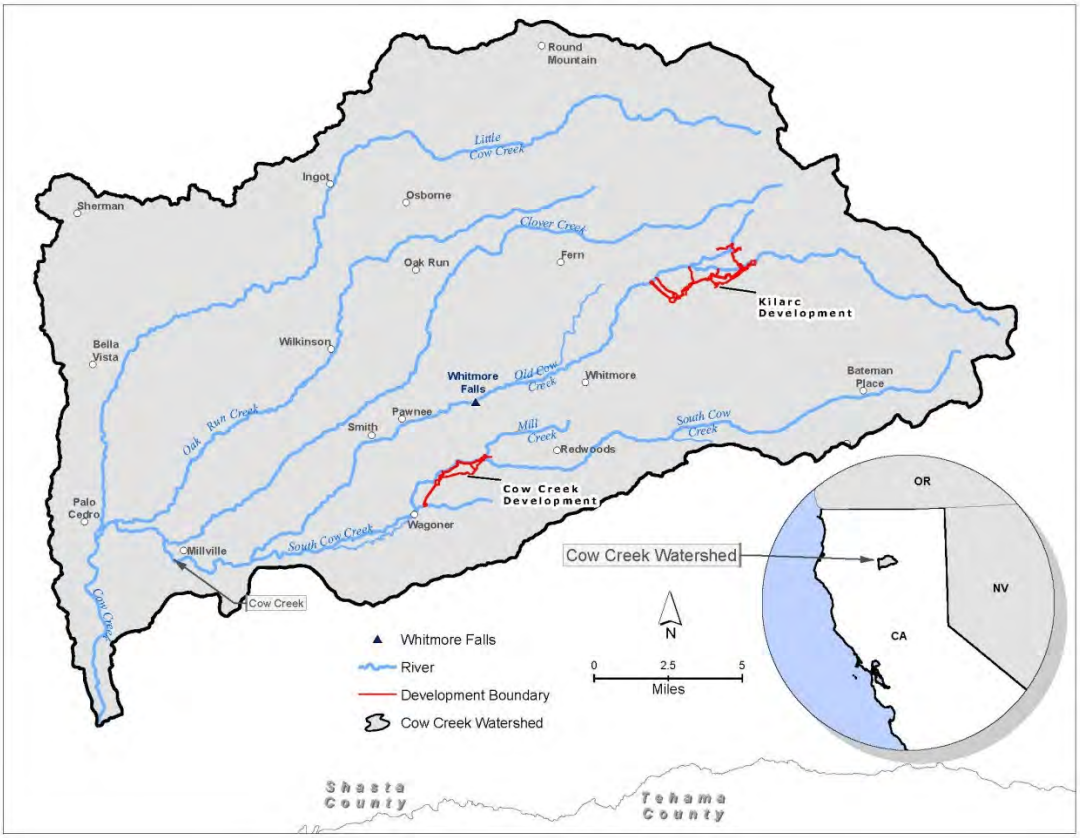
EMAIL LIST SERVICE

Interested persons are encouraged to subscribe to an email list serve for future notices about the Water Rights Water Quality Certification program at: http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml, under Water Rights Topics choose "*Water Rights Water Quality Certifications*." The email list service will be the primary method for providing future notices related to the Pinecrest Conditions and other notices pertaining to PG&E's Project Certification. Persons without access to email may request paper copies of future notices by mailing such request to the above address.

Please direct questions about this notice to Mr. Jeffrey Parks at (916) 341-5319, by email to jparks@waterboards.ca.gov. Written correspondence should be addressed as follows:

State Water Resources Control Board
Division of Water Rights
Attn: Jeffrey Parks
P.O. Box 2000
Sacramento, CA 95812

Notice of Preparation and Scoping Meeting for an Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender



PROJECT AREA

To save paper, the State Water Resources Control Board (State Water Board) strongly encourages interested parties to subscribe to receive information by email. If you would like to receive future announcements about Kilarc-Cow Creek Hydroelectric Project related matters, please provide your email address or mailing address to Mr. Jeffrey Parks at (916) 341-5319 or JParks@waterboards.ca.gov. If you would like to receive additional information related to the Division of Water Rights Water Quality Certification Program, please subscribe to the State Water Board's email list for "Water Rights Water Quality Certification" under "Water Rights" online at: http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml

Alternatively, if you would like to be placed on the State Water Board's hard copy mailing list for Kilarc-Cow Creek Hydroelectric Project related matters, you must request to be placed on the list. If you do not request to be placed on the mailing list (or request to remain on the list if you are already on the list) by April 22, 2013, you will no longer receive hard copy notices until such time as the State Water Board receives a renewed request to be placed (remain) on the hard copy mailing list.[1] Requests to be placed on the hard copy mailing list should be sent to:

Jeffrey Parks
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000.

[1] There will be the opportunity to sign up for the hard copy mailing list at the scoping meeting.

Notice of Preparation **Form B**

To: State Clearinghouse, Governor's Office of Planning and Research
P.O. Box 3044
Sacramento, CA 95812-3044

Subject: **Notice of Preparation of an Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender**

Lead Agency:		**Consulting Firm (If applicable):**	
Agency Name	State Water Resources Control Board	Firm Name	Cardno ENTRIX, Inc.
Street Address	P.O. Box 2000	Street Address	701 University Ave. Suite 200
City/State/Zip	Sacramento, CA 95812-2000	City/State/Zip	Sacramento, CA 95825
Contact	Mr. Jeffrey Parks	Contact	Ms. Laurie Warner Herson

The State Water Board is the California Environmental Quality Act (CEQA) lead agency for the Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project) under its discretionary Clean Water Act (CWA) Section 401 water quality certification (certification) authority. Pacific Gas and Electric Company (PG&E) owns and operates the Kilarc-Cow Creek Hydroelectric Project (Hydro Project). The State Water Board plans to prepare an Environmental Impact Report (EIR) for the surrender of the federal license for the Hydro Project. The Hydro Project is licensed by the Federal Energy Regulatory Commission (FERC), and is designated as FERC Project No. 606. The existing license expired on March 27, 2007, and the Hydro Project continues to operate under an annual license. On March 13, 2009, PG&E filed an application to surrender its license for the Hydro Project. In compliance with the National Environmental Policy Act (NEPA), FERC prepared an Environmental Impact Statement (EIS).

On July 6, 2012, PG&E reapplied to the State Water Board for certification of the Proposed Project. The State Water Board must comply with CEQA prior to issuing any certification. The State Water Board determined that the FERC EIS does not fully comply with CEQA, and therefore has determined that it is necessary to prepare a separate EIR in conformance with CEQA.

The State Water Board is seeking comments from trustee agencies and interested persons concerning the scope and content of the environmental information to be included in the EIR. Please send your comments to Mr. Jeffrey Parks at the address shown at the end of this Notice of Preparation. In your response, please provide the name and contact information for a contact person in case there are questions about the comments.

Project Title: Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project)

Project Location: The Hydro Project is located in Shasta County, California, about 30 miles east of the city of Redding, near the community of Whitmore. The Hydro Project consists of two developments located in the Cow Creek watershed, which drains into the Sacramento River. The Cow Creek watershed is comprised of two drainage areas: Old Cow Creek (Kilarc Development); and South Cow Creek (Cow

Creek Development). The location of the Hydro Project and associated developments are shown in the figure at the front of this Notice of Preparation.

SCOPING MEETING

A scoping meeting is scheduled as presented in the table below and will be conducted in two parts. In the first part, State Water Board staff, or contractors working on behalf of the State Water Board, will explain the Proposed Project, describe the State Water Board's role as the certification agency, and provide other information to trustee agencies and interested persons. During the second part, attendees will be provided with the opportunity to submit oral and written comments concerning the range of alternatives, potentially significant effects, and mitigation measures that should be analyzed in the EIR. The time allotted for each individual or organization to comment orally may be limited if the number of people in attendance so requires. The scoping meeting will be documented by transcript.

Scoping Meeting Date and Time	Scoping Meeting Location
April 10, 2013 6:00 p.m. – 8:00 p.m.	Millville Grange **22037 Old 44 Drive** Palo Cedro, CA 96073

If you would like to request a reasonable accommodation for a disability, please contact Ms. Laurie Herson, of Cardno ENTRIX, at laurie.warnerherson@cardno.com or (916) 386-3861.

QUESTIONS AND ADDITONAL INFORMATION

General questions about this Notice of Preparation should be directed to Mr. Jeffrey Parks at (916) 341-5319 or JParks@waterboards.ca.gov. Questions regarding legal issues should be directed to Mr. Carlos Mejia at (916) 341-5184 or carlos.mejia@waterboards.ca.gov.

Information related to the water quality certification for the Proposed Project will be posted on the Proposed Project's webpage, which is available online at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml

BACKGROUND

Pursuant to the CEQA, Public Resources Code, Sections 21000 et seq., the State Water Board is initiating preparation of an EIR regarding the potential impacts of the Proposed Project as compared to the environmental baseline of current Hydro Project conditions. The CEQA Project objectives are to:

- Surrender the license for operation of the Hydro Project in conformity with the March 2005 Memorandum of Agreement (Agreement) executed by PG&E, the State Water Board and others. The Agreement contains a list of subjects to be addressed through the decommissioning process (e.g., the disposition of canals).

- Decommission and remove or modify several Hydro Project features and facilities to comply with California water quality standards.

Section 401 of the CWA (33 U.S.C. § 1341) requires every applicant for a federal license or permit that may result in a discharge into navigable waters to provide the federal licensing or permitting agency with certification that the project will be in compliance with specified provisions of the CWA. Section 401 provides that conditions of certification shall become conditions of any federal license or permit for the

project. The State Water Board is the agency in California that is responsible for certification of any potential discharge from an activity that requires a FERC license or amendment. (Wat. Code, § 13160; Cal. Code Regs., tit. 23, § 3855, subd. (b).) The issuance of a Section 401 certification is a discretionary action subject to CEQA compliance. Because there are potentially significant impacts associated with the Proposed Project, the State Water Board has decided to prepare an EIR.

Under the provisions of the CWA, a certification may be issued if the State Water Board determines that the project will comply with specified provisions of the CWA, including water quality standards and implementation plans. The State Water Board will determine whether the Proposed Project adequately protects the beneficial uses and meets the water quality objectives for water bodies in the Proposed Project area, as defined in the *Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins* (Basin Plan; Central Valley Regional Water Quality Control Board, 2007). Additional information concerning the Basin Plan and designated beneficial uses is available at the following website: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml.

On September 16, 2009, FERC issued a public notice of scoping meetings and environmental site reviews to assist it in identifying the scope of the environmental issues that should be analyzed in the NEPA document. Scoping meetings and environmental site reviews were held October 19-22, 2009. On the basis of comments filed in response to the scoping notice and comments made at the scoping meeting, FERC staff issued a Notice of Intent to prepare an EIS on February 19, 2010. FERC prepared a draft EIS (DEIS) to describe and evaluate the probable effects, including site-specific and cumulative effects of PG&E's proposal (Proposed Action) and reasonable alternatives to the Proposed Action. The DEIS was issued on June 22, 2010. FERC issued the Final EIS on August 16, 2011, recommending the license surrender as proposed, with additional FERC recommendations.

When an EIS for a project has already been completed, the CEQA lead agency should use the federal EIS as the EIR, if the EIS complies with CEQA. (Cal Code Regs, tit. 14, § 15221, subd. (a).) In this instance, the EIS meets many of the requirements of CEQA, and will form the basis for the EIR. In some areas, however, the EIR must differ from the EIS in order to:

- Reflect the independent judgment of the State Water Board (See Cal. Code Regs., tit. 14, §§ 15090, 15084, subd. (a).);
- Incorporate more recent information important to environmental review;
- Ensure that sufficient information is disclosed regarding the potential environmental impacts of a range of conditions the State Water Board may impose to meet water quality standards; and
- Comply with any CEQA provisions not covered in the EIS.

Brief Description of the Existing Hydro Project Facilities

The Hydro Project is comprised of two developments (Kilarc and Cow Creek), which are described in further detail below.

Kilarc Development

The Kilarc Development operates as a run-of-river facility, which uses the natural flow and elevation drop of Old Cow Creek to generate electricity. The Old Cow Creek watershed encompasses about 80 square miles, including 25 square miles located upstream of the Kilarc diversion dam. Average yearly runoff at the dam is 48,900 acre-feet (af), about 55 percent of which is diverted to the Kilarc powerhouse.

Water is supplied to the Kilarc powerhouse from the Kilarc main canal. Water is supplied to the Kilarc main canal from various sources, via canals and siphons, including: Old Cow Creek, South Canyon Creek and North Canyon Creek. The flow of water through the watershed and into the Kilarc main canal is outlined below.

- Water is diverted from North Canyon Creek into the North Canyon Creek canal at the North Canyon Creek diversion dam and is conveyed to South Canyon Creek.
- Water is diverted from South Canyon Creek into the South Canyon Creek canal at the South Canyon Creek diversion dam.
- Water from South Canyon Creek canal flows into the South Canyon Creek siphon, which conveys water into the Kilarc main canal.
- Water is diverted from Old Cow Creek into the Kilarc main canal at the Kilarc diversion dam.

Water from the Kilarc main canal flows to the Kilarc forebay and through the penstock to the Kilarc powerhouse. Water is returned to Old Cow Creek near the Kilarc powerhouse about four miles downstream from the Kilarc diversion dam. The current minimum flow requirement at the Kilarc diversion dam is 3.0 cubic feet per second (cfs).

The dam at the Kilarc forebay is earth-filled and has a maximum height of 13 feet (ft). The Kilarc penstock is 4,801 ft long and has a maximum flow capacity of 43 cfs. The spillway at the Kilarc forebay is rated for 50 cfs, which is the Kilarc main canal's approximate capacity. The elevation of the Kilarc forebay is about 3,779 feet above mean sea level (ft msl). The forebay has a gross and useable storage capacity of 30.4 af and has a surface area of 4.5 acres. Water level fluctuation in the forebay during normal operation is about one foot. The Kilarc powerhouse is located at 2,580 ft msl and is designed for semi-automatic operation with forebay level control. The powerhouse operates unattended with alarms connected to PG&E's Pit 3 powerhouse (which is part of FERC Project No. 233). The Kilarc powerhouse is a 65-ft-wide by 40-ft-long steel frame structure composed of rubble masonry walls and a corrugated iron roof.

Cow Creek Development

The Cow Creek Development operates as a run-of-river facility. The South Cow Creek watershed encompasses about 78 square miles, including 53 square miles located upstream of the south Cow Creek diversion dam. Average annual runoff at the dam is 79,500 af, about 37 percent of which is diverted to the Cow Creek powerhouse.

Water is supplied to the Cow Creek powerhouse from the south Cow Creek main canal. Water is supplied to the south Cow Creek main canal from Mill and South Cow Creeks as described below.

- Water is diverted from Mill Creek into the Mill Creek-South Cow Creek canal at the Mill Creek diversion dam.
- Water is diverted from South Cow Creek and from the Mill Creek-South Cow Creek canal into the South Cow Creek main canal at the South Cow Creek diversion dam and flows to the Cow Creek forebay.

From the forebay, water flows through the penstock to Cow Creek powerhouse and is discharged into Hooten Gulch, and then back into South Cow Creek about four miles downstream of the South Cow Creek diversion dam. The current minimum flow requirements at the South Cow Creek diversion dam are 4.0 cfs in normal water years and 2.0 cfs in dry water years.

The Cow Creek forebay dam is earth-filled and has a maximum height of 16 ft. The Cow Creek forebay has a surface area of one acre and a gross and useable storage capacity of 5.4 af. The forebay elevation is about 1,555 ft msl, and water surface elevation varies by about one foot during normal operations. The Cow Creek penstock is 4,487 ft long. The spillway at Cow Creek forebay is rated for 50 cfs, which is the South Cow Creek main canal's approximate capacity. The Cow Creek powerhouse is located at 856 ft msl and is a steel truss structure that is about 53.5 ft long by 35 ft wide. The Cow Creek powerhouse is designed for semi-automatic operation, with forebay level control. The Cow Creek powerhouse operates unattended, with alarms connected to the Pit 3 powerhouse.

FERC EIS Alternatives

The FERC EIS will provide the foundation for the EIR. The FERC EIS evaluated four alternatives, as follows:

- No Action Alternative: This alternative consists of continued operation of the Hydro Project under current conditions.
- Proposed Action: As described in PG&E's FERC license surrender application, this alternative proposes to surrender the license for operation of the Hydro Project and to decommission and remove or modify several Hydro Project features, including: (1) remove diversion dams and allow for free passage of fish and sediment; (2) leave in place some diversion dam abutments and foundations to protect stream banks and provide grade control; (3) leave in place and secure powerhouse structures during decommissioning with an option for preservation of powerhouse structures for future reuse; (4) remove electric generators, turbines, and other equipment; (5) grade and fill forebays; and (6) in consultation with affected landowners, leave in place, breach, or fill canal segments and remove metal and wood flume structures. Additionally, PG&E proposes to retire access roads to the Hydro Project where possible. Under PG&E's proposal, the removal of the Hydro Project facilities would take three years, followed by at least two years of maintenance and monitoring of the restoration work.
- Alternative 1 — Retaining Kilarc Forebay: Alternative 1 ensures continued recreational access at the Kilarc forebay. Those facilities of the Kilarc Development required to maintain the forebay would be improved to provide fish passage and to increase flows to the bypass reach. The remainder of the Kilarc Development and the entire Cow Creek Development would be decommissioned as described in PG&E's Proposed Action.
- Alternative 2 — Retaining Flow to Abbot Ditch Users Existing Point of Diversion: Alternative 2 would maintain flow in Hooten Gulch to ensure continued flow to the Abbot Ditch Users (ADU) existing point of diversion. ADU would continue to access water at the current point of diversion. Those facilities of the Cow Creek Development required to maintain flow to Hooten Gulch would be improved to provide fish passage and to increase flow to the bypass reach. The remainder of the Cow Creek Development and the entire Kilarc Development would be decommissioned as described in PG&E's Proposed Action.

CEQA Project Description and Alternatives

The CEQA Project under review is PG&E's proposal to surrender the license for operation of the Hydro Project and to decommission and remove or modify several Hydro Project features. For purposes of CEQA, at a minimum the EIR will evaluate the Proposed Project as approved in the FERC EIS, Alternatives 1 and 2, and the CEQA No Project Alternative. California Code of Regulations section 15063, subdivision (g) provides that the lead agency may consult with the applicant to determine whether

the applicant would be willing to revise the project to reduce or avoid potential significant effects. The State Water Board, as the lead agency, may choose to evaluate an additional alternative after that consultation.

The four alternatives proposed for evaluation in the EIR are as follows:

- Proposed Project: Pursuant to the Federal Power Act and FERC regulations, PG&E filed an application to surrender its license for the Hydro Project with FERC on March 12, 2009. The Proposed Project is the same as PG&E's Proposed Action. PG&E's Proposed Action is described above under the first bullet of the FERC EIS Alternatives section.

  After FERC approval of engineering and management plans for decommissioning and after PG&E obtains the required permits, PG&E would commence decommissioning activities in phases beginning with either the Kilarc Development or the Cow Creek Development and then proceeding to decommission the other development.

  PG&E would continue operating the Hydro Project, or some portion thereof, until decommissioning activities make such operation infeasible. Power generation would continue until the facilities required for generation are removed or decommissioned. It is expected that removal of the Hydro Project facilities would take three years, followed by at least two years of maintenance and monitoring of the restoration work overseen by FERC. Any additional monitoring would be overseen by other agencies. The license for the Hydro Project expired on March 27, 2007, and the Hydro Project is currently operating under an annual license from FERC. It is anticipated that FERC will continue to issue annual license extensions until the license surrender process is complete.

  Exhibit E of PG&E's License Surrender Application (LSA) contains site-specific protection, mitigation, and enhancement measures proposed by PG&E for decommissioning of the Hydro Project. These measures, as well as additional environmental measures recommended by FERC are considered part of the Proposed Project Description.

  The PG&E LSA and FERC EIS can be accessed at the following websites:

  - PG&E LSA: http://www.kilarc-cowcreek.com
  - FERC EIS: http://www.ferc.gov/industries/hydropower/enviro/eis.asp

- Alternative 1 — Retaining Kilarc Forebay: As described above in the FERC EIS Alternatives section.
- Alternative 2 — Retaining Flow to ADU Existing Point of Diversion: As described above in the FERC EIS Alternatives section.
- CEQA No Project Alternative: The FERC EIS "No Action Alternative" is described above, however PG&E commented that the EIS "No Action Alternative" is misleading as "the Project may not operate indefinitely under annual licenses, but rather must cease operation."[2] While FERC agreed that the Hydro Project cannot operate indefinitely under annual licenses, its "No Action Alternative" was considered the environmental baseline. The CEQA environmental baseline is based on the existing operating conditions at the time of the release of this Notice of Preparation. (Cal. Code Regs., tit. 14, § 15125) The environmental baseline will not be considered the "No Action Alternative" for this EIR, as the outcome of PG&E failing to obtain approval to

[2] From PG&E August 25, 2010 comments on FERC's EIS.

decommission will not result in continued operations under current conditions. The CEQA "No Project Alternative" will be developed in consultation with both PG&E and FERC after the scoping comment period to capture the likely environmental consequences if decommissioning is not approved.

The EIR will likely include an analysis of the combined effects of Alternatives 1 and 2 to assess the cumulative effects of the proposed alternatives.

At a minimum, the EIR will evaluate the following environmental factors, as required by CEQA:

Aesthetics	Land Use/Planning
Agriculture and Forestry Resources	Mineral Resources
Air Quality	Noise
Biological Resources	Population/Housing
Cultural Resources	Public Services
Geology/Soils	Recreation
Greenhouse Gas Emissions	Transportation and Traffic
Hazards and Hazardous Materials	Utilities/Service Systems
Hydrology/Water Quality	Mandatory Findings of Significance

Additionally, the EIR will address growth-inducing impacts, cumulative impacts and significant unavoidable impacts (if applicable).

SUBMITTAL OF WRITTEN COMMENTS

Please send your written comments regarding this Notice of Preparation of an EIR for the Proposed Project to the address below. When submitting your comments, please provide a contact person and contact information in case there are questions about the comments. **The comment deadline is Noon (12:00 p.m.) on April 22, 2013.**

Attention: Mr. Jeffrey Parks
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Phone: (916) 341-5319
Fax: (916) 341-5400
Email: JParks@waterboards.ca.gov

MAR 1 2 2013

Date

Erin Ragazzi
Water Quality Certification Program Manager

Parks, Jeff@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, April 16, 2013 3:25 PM
To: Water Rights Water Quality Certification
Subject: Kilarc-Cow Hydroelectric Project, FERC #606 - Reminder of Comments Deadline

This is a message from the State Water Resources Control Board.

This email is a reminder that comments for the Notice of Preparation (NOP) of an Environmental Impact Report on the Kilarc-Cow Creek Hydroelectric Project are due by **NOON** on **April 22, 2013**. Comments may be sent by email to jparks@waterboards.ca.gov , faxed to (916) 341-5400 ATTN: Jeffrey Parks, or mailed to:

State Water Resources Control Board
Division of Water Rights
Attn: Jeffrey Parks
P.O. Box 2000
Sacramento, CA 95812

You may also call Jeffrey Parks at (916) 341-5319 for questions on this project or if you need help submitting comments by the deadline. The NOP and related documents can be found at http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml

The website above also contains the comments received at the public meeting and is currently being updated as new comments are received. If you know someone who would benefit from this information, please forward this email.

If you are receiving this notice in a forwarded message and would like to subscribe to the "Water Rights Water Quality Certification" notice list, go to:

http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml

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Appendix A
Newspaper Notices

Notice published in the East Valley Times

PUBLIC NOTICE

NOTICE IS HEREBY GIVEN THAT the State Water Resources Control Board (State Water Board) has issued a Notice of Preparation (NOP) of an Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project). The Proposed Project is owned by Pacific Gas and Electric Company and licensed under Federal Energy Regulatory Commission Project No. 606. State Water Board staff will hold a scoping meeting at the time and location below to receive oral comments from trustee agencies and the interested public.

Wed., April10th, 2013 from 6:00pm to 8:00pm
Millville Grange
20237 Old 44 Drive
Palo Cedro, CA 96073

The NOP may be viewed at:
http://www.waterboards.ca.gov/public_notices/comments/docs/notice_kilarc_cow.pdf
or by contacting the staff below. General questions about this notice should be directed to Mr. Jeffrey Parks at (916) 341-5319 or **JParks@waterboards.ca.gov.**

Notice published in the Redding Searchlight

NOTICE IS HEREBY GIVEN THAT The State Water Resources Control Board (State Water Board) has issued a Notice of Preparation (NOP) of an Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project). The Proposed Project is owned by Pacific Gas and Electric Company and licensed under Federal Energy Regulatory Commission Project No. 606. State Water Board staff will hold a scoping meeting at the time and location below to receive oral comments from trustee agencies and the interested public.

Wed., April 10th, 2013 from 6:00pm to 8:00pm
Millville Grange, 20237 Old 44 Drive, Palo Cedro, CA 96073

The NOP may be viewed at:
http://www.waterboards.ca.gov/public_notices/comments/docs/notice_kilarc_cow.pdf or by contacting the staff below. General questions about this notice should be directed to Mr. Jeffrey Parks at (916) 341-5319 or JParks@waterboards.ca.gov.

March 12, 13, 16, 17, 23, 24, 30, 31, 2013 and April 6 , 7, 2013 6778330

Kilarc-Cow Creek Hydroelectric
Power License Surrender Project
Water Quality Certification EIR

APPENDIX B

SCOPING MEETING PRESENTATION

Kilarc-Cow Creek Hydroelectric Project Public Scoping

April 10, 2013

State Water Resources Control Board

Division of Water Rights

Scoping Meeting Schedule

1. Welcome and Review Meeting Set-Up
2. Presentation by State Water Board Staff
3. Comments by Attendees
4. Closing and Next Steps

Meeting Set-Up

- Sign in sheet and speaker cards are at back of room
- Fill out a speaker card if you wish to comment
- Comments may be limited to a set amount of time based on the number of people wishing to speak
- The purpose of the meeting is not to discuss comments, staff will answer general questions
- Please respect all speakers, all points of view are valid
- No decisions will be made today

Presentation Outline

- Background
  - State Water Board's Mission
  - State Water Board Role in CEQA
  - Water Quality Certification
- CEQA Process
- Public Input
- Next Steps & What to Expect

State Water Board's Mission

To preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.

http://www.waterboards.ca.gov

State Water Board: Background

- Joint authority for water rights and water quality to provide protection of California's waters
- Protect and enforce many water uses including needs of industry, agriculture, municipal districts, and environment
- Balancing role between the various beneficial uses of water

Why are we here?

- PG&E submitted an application to surrender its hydropower project
- State Water Board regulates hydroelectric projects via issuance of water quality certifications (§401 of Clean Water Act)
  - Protect water quality
  - Balance beneficial uses
  - Consider existing water rights

California Environmental Quality Act (CEQA)

- State Water Board is making a discretionary decision with the water quality certification
- As PG&E is not a public agency, the State Water Board is the lead agency for CEQA
  - Decides type of document
  - Decides level of review
  - Represents State Water Board's independent judgment

Water Quality Certification

- State Water Board will use the CEQA document to develop an assessment of the project, called our "Findings of Fact"
- The CEQA document and the Findings of Fact will be used to justify the action taken for the water quality certification, including any conditions in the certification if it is issued

Water Quality Certification

- If a water quality certification is issued, the conditions in it become a mandatory part of FERC's conditions when it decides to act on the license surrender
- Nothing in the water quality certification can preempt Federal law, it is additive to any conditions FERC places on the project

Kilarc-Cow Creek Hydroelectric Project

- PG&E owns Hydroelectric Project
- Consists of two "developments"
  - Kilarc Development on Old Cow Creek
  - Cow Creek Development on South Cow Creek

Kilarc-Cow Creek Hydroelectric Project

- PG&E submitted a license surrender application to FERC
- Under the license surrender application, PG&E proposes to remove most project facilities and conveyances, aka decommissioning
- Decommissioning is the project that is being analyzed under CEQA

Development of Documents

- State Water Board has a three party Memorandum of Understanding with PG&E and Cardno ENTRIX
- Cardno ENTRIX develops environmental documents under the sole direction of the State Water Board
- Cardno ENTRIX is compensated for the work by PG&E

CEQA Objectives*

- Disclose to decision makers and the public significant environmental effects of proposed activities
- Identify ways to avoid or reduce environmental damage
- Prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures

*From the CEQA Deskbook, 3rd Ed., Bass, Bogdan, Rivasplata

CEQA Objectives

- Disclose to the public reasons for agency approval of projects with significant environmental effects
- Foster interagency coordination in review of projects
- Enhance public participation in planning process

CEQA Process

- As stated in Notice of Preparation (NOP), the State Water Board has decided to prepare an Environmental Impact Report (EIR)
- The NOP identifies environmental areas and alternatives that will be evaluated in EIR
- EIR is designed to identify significant impacts and mitigation measures to reduce significant impacts

CEQA Process

- Alternatives will be evaluated in light of how they meet project objectives, and in light of each alternative's feasibility
- The final feasibility of alternatives will be determined when the State Water Board adopts the findings of fact, based on the final EIR
- The final EIR must also include a response to comments made on the draft EIR

Order of Events

Collect Comments on NOP (Oral and Written)

↓

Issue Draft EIR for Public Comments

↓

Issue Final EIR

Public Input

- Draft EIR will have a public review and comment period
- State Water Board plans on releasing a draft water quality certification at the same time as the draft EIR
- California Code of Regulations allows for any party to request a petition for reconsideration

Next Steps

- Accepting written comments until Noon on Monday, April 22, 2013; send to Mr. Jeffrey Parks:
  - Email: jparks@waterboards.ca.gov
  - State Water Resources Control Board
    Division of Water Rights
    Attn: Jeffrey Parks
    P.O. Box 2000
    Sacramento, CA 95812
  - Fax: (916) 341-5400 Attn: Jeffrey Parks
  - Phone: (916) 341-5319

Next Steps

- Presentation will be posted to Kilarc-Cow Creek Hydroelectric Project webpage
- State Water Board staff will work with consultant to develop a draft EIR based on existing information and comments collected
- There will be a public comment period for the draft EIR

Additional Information

- Available on State Water Board's webpage at:

http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml

Future Updates

- To receive future updates sign up to receive emails online at:

  http://www.waterboards.ca.gov/resources/email_subscriptions/

  - Select "State Water Resources Control Board"
  - Enter email address and full name
  - Under Categories, select "Water Rights"
  - Select Box for "Water Rights Water Quality Certification"
  - Click "Subscribe" button at top

Questions

Following questions we will proceed with the public comment period

Kilarc-Cow Creek Hydroelectric
Power License Surrender Project
Water Quality Certification EIR

APPENDIX C

WRITTEN RESPONSES TO THE NOP

APPENDIX C-1

NOP Written Comments

Comment 1

Office of the County Counsel
County of Shasta

RUBIN E. CRUSE, JR., COUNTY COUNSEL

ASSISTANT
James R. Ross

DEPUTIES
David M. Yorton, Jr.
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(530) 225-5711
(530) 225-5817 FAX
Relay Service, dial 711

April 20, 2013

Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project)

Comments from Coalition

1. As interveners in the FERC Project 606, the "Project", Shasta County, Evergreen Shasta Power, LLC, the ADU, and the Tetrick Ranch, "the Coalition" hereby requests that all evidence, comments, and alternatives that were presented to FERC by the Coalition in the FEIS proceeding should be included in the CEQA process record. They are relevant to understanding the background of the Coalition, to evaluating the PG&E proposal to surrender its license at the FERC, and to resolve and protect the water rights of the affected parties and the public interest. A list of these documents and their electronic links is attached as "Attachment A" herein. We ask that they be made a part of this proceeding's record. It should also be noted that the alternative proposed by ESP and Shasta County to the FERC is still open for consideration. See Offer of Settlement of Tetrick Ranch, the Abbott Ditch Users, Shasta County, Sierra Pacific Industries, Inc., and Evergreen Shasta Power, LLC under P-606 dated 1/22/2010 elibrary accession number 201200122-5126.

2. I am informed that the Coalition had multiple non-public meetings with the SWRCB, CDFG, NMFS, CDNR, PG&E, Congressmen, Senators, environmental law firms, and several NGO's to discuss other alternatives and proposals. The Coalition's plan and several options attempted to balance and make tradeoffs among holders of water rights, protection of existing water delivery systems, maintaining renewable energy, provision for local and regional fire suppression, public recreation, and habitat enhancement. The proposals and options included maintaining the Kilarc plant and decommissioning the South Cow plant, land trades, mitigation, and acquisition proceeds to PG&E and other such offers in exchange

for maintaining all or part of the Project. PG&E informed the Coalition that if the resource agencies would buy in to any of our alternatives, that they would work with us to attempt to settle matters. While the agencies seemed interested at these meetings in the benefits of the mitigation and lands being offered, they made it very clear that they would not accept any alternative that retained hydro power in any part of the Project. Certain key people at the resource agencies stated that they agreed with the merits of our proposed alternatives, but stated that a decision had already been made and that they stood by the 2005 MOU that would decommission the entirety of the FERC Project 606 (Kilarc/South Cow Creek).

3. This pre-decision by the signatories of the MOU without offering the adjoining and affected landowners, water right holders a place at the table, has caused much frustration and dismay throughout the FERC process. It is our hope that the SWRCB will take a broader view of the matters at stake and seriously consider abrogating the 2005 MOU in that the terms of the 2005 MOU are not being met by the proposed License Surrender Application.

4. Over 8 years have gone by since the 2005 MOU and there are still no details and, to my knowledge, nothing has materialized. From the transcripts of the public meetings held by FERC Staff, it appears that water supply issues and alternatives have not been addressed.

5. The 2005 MOU should have included the landowners and water right holders such as Sierra Pacific Industries, the ADU and the Tetrick Ranch. Any revised MOU or re-established MOU should include the members of this Coalition.

6. The Coalition requests that the SWRCB instruct FERC to add conditions reconsider and redraft the FEIS; and adopt the SWRCB recommendations as a condition.

Shasta County _____ Date 7/22/13

Pacific Gas and Electric Company®

Power Generation
245 Market Street
San Francisco, CA 94105

Mailing Address
Mail Code N11D
P.O. Box 770000
San Francisco, CA 94117

April 22, 2013

Jeffrey Parks
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812

RE: CEQA Scoping for Kilarc-Cow Creek Hydroelectric Project (FERC Project No. 606)

Dear Mr. Parks:

Pacific Gas and Electric Company (PG&E) has reviewed the State Water Board's Notice of Preparation (NOP) of an Environmental Impact Report on the Kilarc-Cow Creek Hydroelectric Project, and also attended the State Water Board's scoping meeting in Palo Cedro on Wednesday, April 10th, 2013. PG&E looks forward to working with the State Water Board and other stakeholders in the process to obtain Section 401 Water Quality Certification. The purpose of this letter is to provide recommended clarifications and comments on certain statements made in the NOP and at the scoping meeting.

In the scoping meeting, State Water Board staff made statements regarding the intent of decommissioning, and PG&E would like to offer clarification. As described in PG&E's License Surrender Application (LSA) and Proposed Decommissioning Plan (PDP) filed with the Federal Energy Regulatory Commission in March 2009, the objectives of the PDP are to achieve specific desired conditions once decommissioning is complete and address potential resource issues associated with decommissioning of the hydro facilities. This may not provide restoration to pre-project conditions for each project component. For example, if removing a dam abutment along a steep slope could significantly increase erosion potential, the decommissioning plan proposes to leave that abutment in place. The detailed description of the decommissioning plan can be found in the PDP (Appendix A of the LSA).

Additionally, the NOP states that "...the CEQA 'No Project Alternative' will be developed in consultation with both PG&E and FERC after the scoping comment period...". PG&E agrees with the State Water Board that if the proposed project is not approved, it cannot be assumed that the hydroelectric facilities will continue to operate indefinitely under annual license renewals.

And finally, the NOP states that "...the EIR will likely include an analysis of the combined effects of Alternatives 1 and 2 to assess the cumulative effects of the proposed alternatives." This statement appears to conflate two different types of CEQA analyses: a discussion of alternatives to the proposed project (Section 15126.6 of the CEQA Guidelines) and a discussion of cumulative impacts (Section 15130 of the CEQA Guidelines). We are unclear about the State Water Board's intended purpose for combining the alternatives and cumulative impact

analyses. We are also uncertain how a cumulative impact analysis of the project alternatives would be effectively performed, because Alternatives 1 and 2 appear to be variations of the proposed project. Additionally, cumulative effects analyses in CEQA only consider probable future projects. If the EIR includes any of the alternatives in its cumulative effects analysis, it should clearly substantiate why these projects are being considered "probable future projects" (per Section 15130[b][1][A] of the CEQA Guidelines) by the State Water Board.

Thank you very much for your consideration of these comments. If you have any questions, please contact me at (415) 973-7465.

Sincerely,

Lisa Whitman,
License Project Manager

Comment 3

198 Sprucemont Place
San Jose, CA. 95139
19 April 2013

Jeffry Parks
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA. 95812-2000

Re: Kilarc-Cow Creek {FERC P-606} CEQA

Jeff,

1. As stated in my letter of 6 April, I will once again repeat my concern that the now defined LSA PME's with respect to the South Cow Diversion Structure are incomplete as they were developed on the basis of inadequate description - either text or analytical. They do not address key issues necessary to best establish a new post dam stable channel for fish passage. In this Decommissioning Process", doing "first things first" was not done in this specific area with respect to the diversion infrastructure present there. It is necessary to first accurately define the current physical condition and **all** relevant issues in close proximity to the dam {about +/- 25 yards upstream and down stream}. Then one can develop a set of solid and valid PM&E's to address the issues. As of now, I see only one option of accomplishing a valid set of objectives (PM&E's) to the satisfaction of all impacted. That approach would have the CEQA require in the implementation of PM&E GEOL-3: Professional Engineering Design Plans, and Specifications Mitigation, and Enhancement Plan" that a Specification & Objectives" phase be first accomplished; and then subject to **Review.** This needs to be done before wasting time, effort, and money developing inappropriate detailed design plans to vague set of objectives. Please refer to Attachment IV{ my 3 page letter of July 7, 2009 to FERC} that outlined one possible procedure for doing this.

2. There are well established procedures in the Literature for the specific situation at hand. One such set is as shown in Attachment III. Those steps are primarily derived from a 1997 ASCE Handbook. The FERC P-606 Decommissioning Process has been in an active phase for more than 5 years now. Per Attachment III, Step one is partially done, but not all options have been explored or discussed because the Process has been open only to the Licensee & the Resource Agencies. Step 2 has been thoroughly done and documented. Step 3 {Channel Geomorphology} has been only partially done with respect to the existing channel. {Zero 3 dimensional data or information immediately downstream of dam}. Unfortunately; essentially Zero investigation has been accomplished with respect to other half of Step 3: { Pre-dam geomorphology}. Please see Attachment I that is a schematic sketch for one possible output for a pre-dam / post dam geomorphology study. Where does one find in the mounds of the Licensee documentation developed to-date over the last five years this information in any form?

3. Issues with Sediment must be addressed in any dam removal. However, it also needs to be realized that those amounts impounded are relatively small compared to what can be transported by these water courses. For example, in the 100 year flood events of 1969, at least three orders of magnitude more in sediment was deposited about a ½ mile upstream of the dam just before the entrance to Wagoner Canyon. In the case of the South Cow Creek Diversion having a natural channel slope only slightly above one degree, it is especially important to accomplish a valid Channel Geomorphic Assessment. This is especially true since man more than a century ago destroyed at least some of the natural channel banks in

the dam area. Those original banks would have been consistent with those observed upstream and downstream within Wagoner Canyon that define a rather narrow (and typically very stable) water course for South Cow Creek within the reaches of the canyon.

4. One can examine this landowners concerns based on simple statements / questions based on Attachment 1:

a. Area 1 is a channel reshaped by man in 1907 to create an entrance to the main canal. It is now the existing last leg of thalweg before the diversion works. How is the stream channel going to magically put itself on a natural course, and not try to do a 90 degree kink at the canal head works unless some sort of bank restoration efforts in this region are undertaken? Such efforts could be as basic as appropriately displacing existing sediment {not removing said sediment} for the proposed pilot thalweg; in combination with well known stabilization techniques such as rip-rap and other bioengineering stabilization techniques

b. The precise location objective of a post dam channel (Area 4) is not yet estimated. However, it will not be as approximately shown in Attachment I unless all those involved grasp the very basic and simple fact that the third step of the cut-off walls is below "grade level". Some means {preferably natural material} needs to be anchored against and along at least one of the walls in this area to bring it up to least the level of the middle section of the cut-off walls. If this is not done, it is obvious the post dam channel course will bias itself towards and against the abutment on the main canal side. Similarly the span of the dam between abutments is on the order of four times the typical channel width within Wagoner Canyon. Hard right and left stops {Preferably natural material} can be anchored against the cut-off walls in the appropriate location to the define the post dam channel width & location. From these points; other barrier techniques in combination with rip rap and pushed sediment could approximate the pre-dam canyon slope geometry.

c. Where the retaining wall now intersects the dam face & right abutment {Area 3a} is far removed from the pre-dam channel bank. It should properly be described as protecting a vertical bank created by man and erosion - not simply the stream channel bank. How is this area to be addressed on dam removal? Hopefully not just per that outlined in the LSA. This retaining wall can appropriately treated in combination with rip rap, sediment barriers and other bioengineering stabilization techniques at the cut-off walls to readily recreate some resemblance of the pre-dam canyon bank in this region. Such action is also required to negate a potential safety/liability issue for the landowner as an exposed cut-off wall represents a jump point into creek waters below.

7. In the absence of analytical data, a text geomorphic description of the dam site as below might have given some insight as to the issues involved.

" The South Cow Creek diversion structure is a concrete capped rubble filled metal crib structure about

86 feet wide - a span about four time the typical channel width in Wagoner canyon. As is typical in most dam structures, natural canyon banks were modified by man to anchor abutments far removed from the natural channel banks. The present dam rests on a pair of cut-off walls attached to bedrock that are in three stair step elevations between the abutments. The center section is approximately at the pre-dam stream bed elevation (which is not bed rock elevation). However that section nearest the main canal is below the pre-dam stream bed elevation. For a short distance upstream of the main canal head works man removed the bank material in this region to direct the thalweg towards the canal intake. The canyon slope for the opposite dam abutment was also carved out. In the course of time waters further destroyed the downstream bank on this side of the dam and a retaining wall was created in the 1980's to protect the eroded hillside from impacting the Mill Creek canal. Where this retaining wall intersects the dam face and abutment is likely about 20 to 25 feet removed from the original channel bank. The typical geomorphic elements that define banks in Wagoner Canyon are readily observable short distances up and down steam of the dam. It does need to recognized that the right canyon walls near the dam are somewhat different for the those typical in the canyon because of the confluence of Mill Creek just down stream of the dam. Just down stream of the dam on the left side it appears some geomorphic remnants the original bank are still present. There may also be some upstream under the sediment for the right bank; but that won't be known until the sediment is combed back on dam removal. As a result of hydrodynamic spill forces, the bedrock below the dam face has likely been scoured deeper than that for the pre-dam state."

6. Attachment 5 is a copy of my 10 page letter of August 19, 2010 for the FERC DEIS.

a. In this Attachment, Page 2 (paragraph 2b); and Page 4 are related to the channel geomorphic issues discussed above.

b. With respect to Cultural comments on pages 7 & 8, this individual has resigned himself to the fact that no one cares if the historical survey was factual & accurate unless the feature involved is eligible to be registered as a "historical landmark" or has been determined to be of "historical Significance. The inaccurate SHPO documents now on file at the Chico CHRIS center are only paper - they can be fixed in the future by those that care about recording history with some degree of accuracy. This type of future fix is not so easily possible if physical features of this project are casually removed without proper analysis; and thus permanent undesirable physical damage results to the stream system.

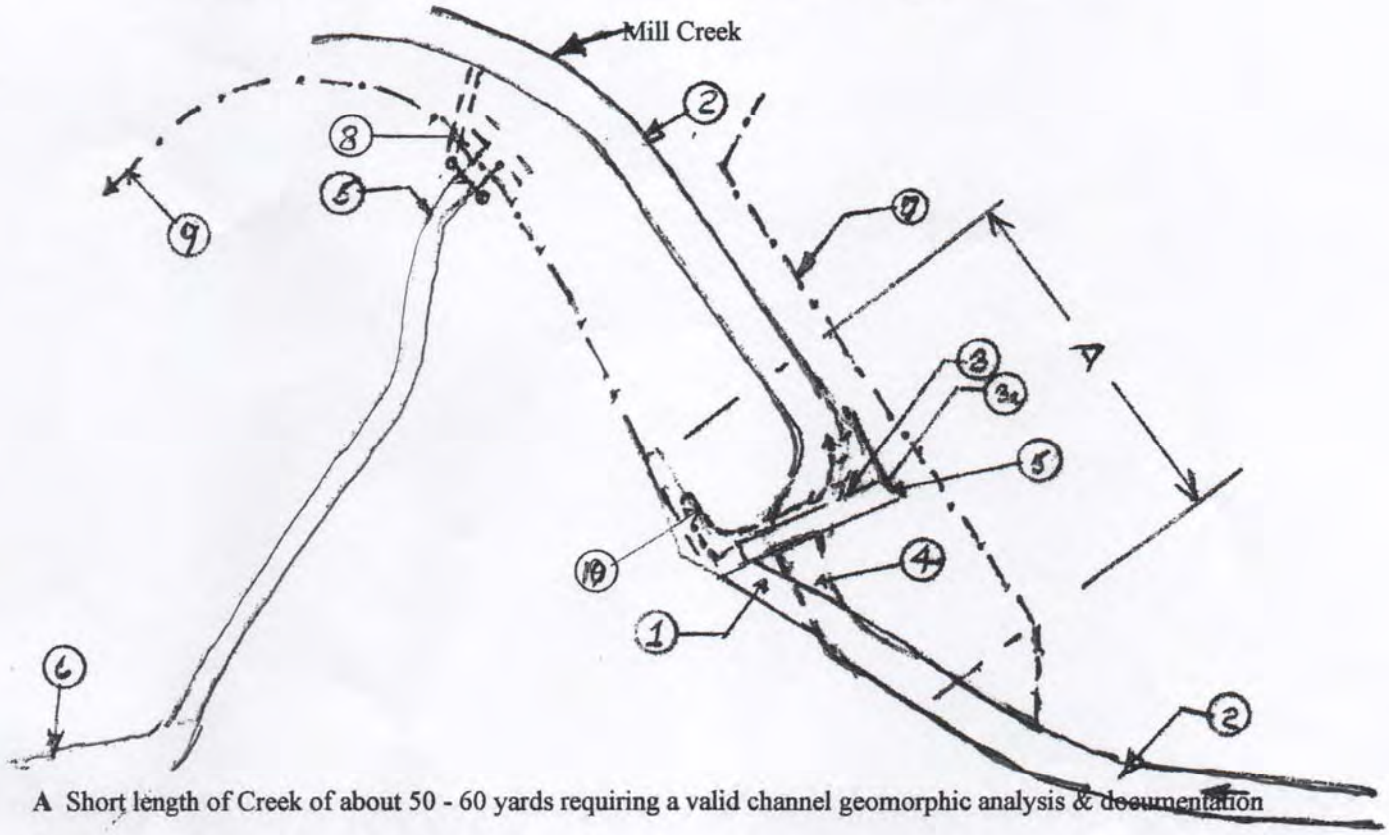
Respectfully,

David W. Albrecht
(408) 225-7600
dtalbrecht@sbcglobal.net

5 Attachments
Atch I : 1 page - South Cow creek Diversion Dam Area Schematic
Atch II : 1 page - Comments on SCC Sediment Geomorphic Assessment
Atch III : 1 page - ASCE 10 Step Dam Removal Checklist
Atch IV: 3 page - FERC Comment letter of July 7, 2009 w/o its attachments
See FERC Library P-606 database for attachments.
Atch V: 10Page - FERC DEIS Comment letter of August 19, 2010

ATTACHMENT I

SOUTH COW CREEK DIVERSION DAM AREA



A Short length of Creek of about 50 - 60 yards requiring a valid channel geomorphic analysis & documentation

1 Man created thalweg into Main Canal 1907 time area

2 Now existing (& likely pre-dam) natural Channel of South Cow Creek above & below dam

3 Rough estimate of pre-dam natural bank slope {possible 20-30 feet removed from retaining wall
3a Retaining wall intersection with dam abutment and face of dam

4 Rough estimate as pre-dam thalweg above & below dam

5 FERC Access Road "A"

6 Approximate location along Road A of past staging areas @ top of canyon for work at Fish Screen area & main canal

7 Mill Creek Canal

8 Main Canal Spillway #1

9 Main Canal

10 Thalweg about 60% of year {fish screen area back down fish ladder and then parallel to dam face 7, then turn

ATTACHMENT II

COMMENTS ON SOUTH COW CREEK DAM {SEDIMENT} GEOMORPHIC ASSESSMENT
BY NORTH STATE RESOURCES dated May 20,2008

1. Note that {Sediment} has been added to title as this study primary concerns only the sediment; and has limited information with respect to a channel geomorphic assessment.
   a. See Page 1: "Introduction " & "Background" as to scope of work.
      * That scope of work was primarily with respect to sediment; and was very limited w/r to channel issues.
   b. A channel geomorphic study for dam removal involves such undertakings such as investigating, estimating, and documenting the channel pre-dam as well as the existing geomorphology, and that which will occur under given dam removal alternatives and channel bank reconstruction options.

2. The study appears thorough and complete with respect to all the aspects of chemical composition and transport of the sediment.
   a. Possibly in the actual dam removal process one would confirm the chemical composition of the sediment at a depth near the cutoff walls after the sediment is combed back.

3. In terms of stream channel geomorphic data, the key data plotted for cross sections X-1 thru X-4 in Figures six thru nine is useful for qualitative insights. However, it is totally useless for quantitative evaluations because the vertical axis absolute elevation calibration is total nonsense. At a very minimum there should also have been plotted at least one more cross section X-0 taken at the upstream face of the dam; to give some additional insight as to the channel response on dam removal. It is assumed that the axis error is one that is easy to correct.

   a. It is presumed {Report doesn't state} that the post dam channel profiles {Figures 6-9}; and sediment purge volume estimates are based on the assumption that the cut-off walls were not left in place.
      a-1: It doesn't appear that the Geologist (Jim Fitzgerald) doing the work was informed of the proposal to leave the cut-off walls in place.

   b. Except for longitudinal profile in Figure 4; there is **ZERO** three dimensional data with respect to a geomorphic profile for the area immediately downstream of the dam. There isn't even a plane view showing where the longitudinal profile was taken.

   c. A three dimensional profile for at least 25 yard down stream of the dam is essential to quantify channel flow after dam removal. Possibly enough data points have already been taken to readily develop such a contour map. It is also important to map the large remnant geomorphic elements in this area immediately downstream of the dam as they likely correspond to the pre-dam bank.

   d. An absolute minimum documentation requirement is a simple plane view plot(s) that show the estimated pre-dam course of the channel; and that after dam removal (given different channel bank reconstruction options).

4. SUMMARY: Report has more than enough information on sediment composition & transport; but is totally inadequate on channel geomorphic data because the Surveyor wasn't requested to do such work. Do not 100% concur with "Recommendations / Findings" on page 8 for "Stream Channel Condition" as now worded because those specific findings are totally unsupported by the Report data.

ATTACHMENT III

Box 6.1 Steps to Preparing Alternative Sediment Management Plans

1. Examine the possible range of dam removal alternatives (continued operation, partial dam removal, and full dam removal).
2. Determine the reservoir sediment characteristics, including volume, spatial distribution, particle size distribution, unit weight, and chemical composition.
3. Investigate the existing and pre-dam geomorphology of the river channel upstream and downstream of the dam.
4. Inventory the existing infrastructure around the reservoir, along the downstream river channel, and along the upstream portion of the river channel influenced by the reservoir.
5. Determine the feasible range of sediment management alternatives and formulate specific alternatives.
6. Coordinate the details of each sediment management alternative with the other aspects of the dam removal alternative.
7. Conduct an initial assessment of the risks, costs, and environmental impacts of each sediment management alternative.
8. Determine what mitigation measures may be necessary to make each alternative feasible and include these measures in the alternative.
9. Finalize the assessment of the costs, environmental impacts, and risks for each modified sediment management alternative.
10. Document the risks, costs, and environmental impacts of each alternative for consideration with the engineering and environmental components of the study. Provide technical support to the decision-making process.

Source: Adapted from ASCE (1997).

ATTACHMENT IV

David W. Albrecht
198 Sprucemont Place
San Jose, CA. 95139

July 7, 2009

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 - 1st Street, N.E.
Washington, DC 20426-0001

Ref: P-606-027-CA, Kilarc-Cow Creek Hydroelectric Project
Application for Surrender of License by
Licensee Pacific Gas and Electric Company

Re: **COMMENTS / PROTEST / RECOMMENDATIONS**
for South Cow Creek Diversion Dismantling Plans

Dear Ms. Bose:

COMMENTS:

The Pacific Gas and Electric Corporation submitted its License Surrender Application (LSA) for its FERC Project P-606 on March 12, 2009. The Licensee has requested that the Commission endorse and approve the Application; and seeks an order to begin detailed engineering proposals for removal of various specific infrastructure in specific areas of the Project.

One such structure is the South Cow Creek Dam that is located on our private lands as a consequence of a deeded easement to the Northern Light & Power Company in 1907 by the former owner of the property.

Detailed engineering proposals are, and should be developed, based on quantitative specifications and objectives; together with other physical attributes and constraints of specific infrastructure and the germane characteristics of the area involved. This Engineer's personal perspective is that in practice within the FERC processes, those PM&E measures encompassing such environmental disciplines such as Geology (GEOL), Geomorphology (GEOM), Aquatic (AQUA), Wildlife, Botanical, etc. become the actual specified objectives and constraining environmental specifications that the detailed engineering plan must satisfy and conform to.

For the South Cow Creek Dam, those PM&E proposals that have been developed for the LSA are in general excellent, given the specific information and data that was made available by the Licensee in the Preliminary Plan (9/2007) and Draft Plan (9/2008). However for multiple reasons: (including incorrect information, casual data analysis, missing data, misleading descriptive information, miscommunication,

etc.); these PM&E measures are not yet comprehensive or complete. For no justifiable reason, the likely **(High Probability)** outcome and consequence of this deficiency is permanent and irreparable damage to our lands and the South Cow Creek channel. Moreover, it puts at significant risk the fundamental objective for removing this hydro project which is to establish an improved, permanent, stable, and reliable channel for future upstream fish passage.

PROTEST

With respect to all those issues, but just those issues, associated with the South Cow Dam in the LSA, at this time the landowners wish to Protest this Application being summarily approved with out additional review. Such review should be possible in a Scoping meeting, or other equivalent forum chaired by FERC.

RECOMMENDATONS

Stakeholders whose private lands are being put at undue Risk, because of the questionable assumptions, information, and plans now set forth in the LSA, should have the opportunity to present their technical analysis as to why additional PM&E's are needed before Licensee is allowed to proceed to the next stage of the Decommissioning Process.

Much of that proposed analysis is of a very detailed technical nature; requiring free dialog between all parties involved. It is suggested that possibly the best way to address the issues at hand, is that there first be a shorter general overview meeting, coupled with a much more detailed and technical follow-up Workshop, and then a Wrap-up meeting. In a Workshop environment, it is easier to have a free exchange of information and input from the perspective of all parties. Please refer to attachment I for addition Comments. There are two other attachments (II & III) provided for the readers convenience. Attachment II is an example of the type of factual material to be presented , discussed, and debated . Attachment III is essentially the same information package that I generated in great haste in October 2008.

Sincerely,

David W. Albrecht,
Landowner, Stakeholder

Encl: Atch I, II & III

cc: Resource agencies per Atch I
P,G & E

Attachment I

COMMENTS:

1. Key Resource Agencies provided with copy of material.

Calif. Dept. of Fish & Game
Northern Region
Attn: Matt Myers
601 Locust Street
Redding CA. 96001

National Marine Fisheries Service
Attn: S. Edmondson / D. White
777 Sonoma Ave. Suite 325
Santa Rosa, CA. 95403-6528

U.S. Fish & Wildlife Service
Attn: William Foster
2800 Cottage Way, Rm W-2605
Sacramento, CA. 95821-6340

U.S. Army Corp of Engineers
152 Hartnell Ave.
Redding, CA. 96002-1842

P,G & E
Attn. Charles White
MC: 11C
P.O. Box 770000
San Francisco, CA 64177

2. Technical Workshop would be most effective if all key agencies represented ~~with~~ nad more than one representative if appropriate. For example for NMFS; Dave White and an individual such as Dr. Brian Cluer. If FERC, has a technical resource individual with expertise in geomorphology (geomorphic stability, fluvial transport), especially one who possibly has worked with the Bureau of Reclamation technical staff on dam removals, the insights of such an individual would be of great value. All private landowners whose lands will be involved in the Dam removal should be invited to attend. One of the landowners has long time practical experience and insights to the nature of the South Cow Creek water flows.

3. Primary Objective of Workshop should be to ensure all the technical objectives and desired outcomes are well defined and established with said objectives supported by sound data analysis. It should not be intended to define and finalize a set of precise engineering means to effect that result.

4. This stakeholder continues to remain sincerely committed to those objectives as set forth on page 1 of Attachment III. However, it is essential that ALL the correct technical objectives be clearly defined with some degree of technical rigor.

5. If questions, please feel free to contact me; e-mail address: dtalbrecht@sbcglobal.net

ORIGINAL

ATTACHMENT V

198 Sprucement Place
San Jose, CA 95139
19 August 2010

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 - 1st Street, NE, Mail Code PJ-12.1 due 9/14/10
Washington, DC 20426

Ref: FERC Project P-606-027 {Draft Environment Impact Statement (DEIS) dated June 22, 2010

Dear Ms. Bose:

The comments below are in response to the P-606 DEIS referenced above, and as a result of other FERC Public meetings held in Shasta County on 7/14 and 8/17/2010 on the same subject. The EIS process has been initiated by FERC in response to concerns with the 3/12/2009 LSA that Licensee has submitted that proposes decommissioning of the Kilarc and Cow Creek Hydro facilities. Comment due date for the DEIS was originally established to 8/9/2010 but was extended 8/25/2010.

1. The DEIS document structure is a lengthy and tedious structure for the average layman (1), to find and locate all points relative to his specific concerns. {(1) self included} However, with patience and perseverance; it is a situation that one can adabt to. To put the preceding into perspective; by comparison, the DSLA was significantly worse; and even with eventual editing and corrections in the LSA; this document is still difficult to reference for specific information on a given topic.

a. Staff has done a reasonably good effort of separating and isolating those issues associated with the Kilarc Development from those associated with the (South) Cow Creek Development; and then doing independent Analysis for each. Working from the structure of the LSA; and sometimes the comments given verbally or in writing by individuals, does not always make this an easy task. If one terms one P-606 Development "A", and the other "B"; please continue to separate informational input and data submitted into either "A" or "B" buckets; although in some situations it can be appropriate to do an "A + B" bucket. All too often statements, data, or a hypothesis is presented with respect to one of the Developments; and the concluson is made with respect to both {"This situation on A is true, therefore it is implied that it is true for both A+B"; or "this is true on B, therefore it is true on both A+B."}

2. However, it also appears to be fair to say that general consensus of those in Shasta County is that the DEIS, in its present form is seriously "deficient"; to use a polite phrase. {Public meeting had words like: "disappointed", "angry about it", "F grade", "if we put together a document like this we'd get laughed out of the court system", etc.}. It may not have been intended; but the DEIS, in its choice of text, and findings do not convey very well that it has been developed in an impartial way. Some new examples:

a. Section 4.3 (Page 263) or Executive Summary (Page xx) has a very short list of just three additional environmental measures that need to be included for the proposed Surrender Order. That is a very short list compared to the host of environmental issues raised by many. There are issues that the now existing LSA does not seem to address; either "by reasonable impartial scientific analysis , or other means; or by competent & complete reports; or by putting forth a document that has basic and sincere veracity in attempting to describe the now existing physical environment for the Project. Now the DEIS seems to be following in the same path.

* The term " Consultation" as used in the DEIS , or LSA, or anywhere in this FERC Process has become a bad joke with respect to reflecting that any meaningful consultations were actually completed, or any useful outcome was achieved.

* It seems to be acceptable that the guidelines for "veracity " can be interpreted for any documents developed for FERC Processes to fall under the same loose guidelines used for Political Campaign Ads where one Candidate can disparage another with statements in Sound-bites or Flyers that are "Not untrue" from a legal libel basis , but the statement makes no effort to have "veracity" with respect to all facts germane to a situation. While this a way of life in the Political arena, this is an unfortunate philosophy to adopt for a FERC process such as this. one.

* Most are left with the impression that Staff seems to take the position that all reports in the LSA have been completed with total accuracy and zero mistakes; or all positions taken in the LSA are environmentally not subject to challenge because the Licensee Staff and/or Resource Agencies have been endowed with some sort of omnipotent status and divine wisdom from above; and therefore any position developed by them is whole and complete by definition needing zero further review or work. It seems to make no diffference if a report needed for a valid analysis is inaccurate or fundamentally incomplete. Those situations are being swept under the rug.

b. While the thoughts expressed in Section 3.3.8.2 (page 179) may be well intended, the text from my point of view does not accurately reflect the entire scope of those Scoping Comments, dated 10/14/2009. These comments were submitted to address what needs to be done in terms of completing a valid "Geomorphic Analysis"; and establishing improved objectives for infrastructure removal at the Cow Creek Diversion area. This work needs to be accomplished before embarking on the more costly effort of developing detailed design plans and specifications. {Engineers are not clairvoyant}. **Please see Attachment I, page 4 , as one of many possible ways to revise the text.**

* It doesn't seem ureasonable that there should be a bullet in Section 4.3; etal that states something like the following: " Some additional geomorphic analysis actions for the Cow Creek diversion area as outlined in Section 3.3.8.2 needs to be done. That effort involves PG&E, private land owners, and the Resource Agencies; and establishing more specific outcome objectives for a preferred long term stable hydrograph; all before embarking on developing detailed design plans and specifications for removing the dam.

3. FERC Staff developed in the DEIS their own Action Alternatives {AA1 & AA2} - specific Alternatives that it seems unlikely anyone in Shasta County anticipated would be in the DEIS. This writer does not wish to debate the relative merits of either; or how appropriate the choice of these Alternatives may be. However, if these are to be the principle reasonable Alternatives; then I do not believe they have been defined or qualified very well. All key State Processes to make them possible, or truly a possible reality, need to be well understood. In short, the defining text now in many ways is somewhat casual and superficial. **Please refer to Attachment II, pages 5 & 6, for an illustration of would be one approach to better qualify AA2.** AA1 has similar deficencies, but to a significantly lesser degree. Staff can reference the 3/2008 PGE document on Kilarc as a Recreation Facility to at least understand the simple text needed where legal processes are required.

4. Despite documentation submitted in July and October; FERC staff seems to have zero concerns that some of the Project Historical Surveys are very sub-standard and inaccurate. Some fundamentally fail basic veracity standards; and one key deficiency in terms of misinformation is already being propagated in the DEIS text. The July 2009 document provided a simple "Recommendation" to fix the problems, but apparently FERC feels that that action is not required or necessary. It seems it is of no concern to this Commission whether or not reports triggered by a FERC Surrender Application are in fact factual. Efforts to rectify some of the deficient Surveys in the beginning of 2009, by meeting with the Contractor that did them, were stonewalled by Licensee staff in San Francisco because they told the Contractor that it "was against FERC Protocol". Basically all text in the DEIS is nothing more than 100% reguritation of Ganda text from their report and SHPO documents. The meaning of FERC Protocol is certainly now taking on a very clear meaning; in terms of its no action attitude on deficient "historical surveys". **Please see Attachment III, pages 7 & 8, for additional comments on Cultural Resources.** If FERC Staff does not wish to address a process to correct these deficiencies in Cultural Resource Reports, will they please have the courtesy to correct the text in Section 3.3.11.1, page 221; on Site 482-12-02H.

5. **Additional miscellaneous comments are to be found in Attachment IV, pages 9 & 10**

6. Much of what seems to be at the center of concern for many, including myself seems to center around the need for improved "Veracity" from all involved. I would also suggest that some problems definitely stem from FERC itself in not having the proper standards for a LSA and decommissioning of infrastructure. The Process for a "License Surrender" now being defined as only a "License Applications in Reverse" with no special standards for such thing as "infrastructure removal" or Historical Surveys of 100% of the APE, or possibly a different time table; is a very poor and inadequate Process guideline. Decommissioning Projects is at least 15 years old now, and the fact that the above hasn't been recognized and responded to, is troubling.

7. I will apologize in advance for some of the less than polite text of this letter.

Thank you for at least allowing "Comments and Critique"

David W. Albrecht

David W. Albrecht, Landowner with Project Infrastucture

Attachment I

Section 3.3.8.2 (Page 179 -starting as shown below) * New or revised text is underlined. Paragraph beginning at the bottom of page has been split and reworded as below.

One individual expressed concern, in comments dated October 14, 2009, about the necessity of having a **valid**, complete, and usable 'Geomorphic Analysis" in very sensitive areas such as the dam site on South Cow Creek to ensure the responsible treatment of private lands during disposition of project facilities with the Proposed Action; and that there is a post decommissioning hydrograph that best achieves the stable fish passage requirements and goals of the Resource Agencies. The individual commented that reasonable preventative or relatively simple proactive measures need to be invoked on his property at the South Cow Creek dam when it is removed to establish a desireable hydrograph that is stable so as to inhibit and preclude abnormal channel depth walking upstream and jeopardizing now existing channel banks that have adapted and become 100% stable for more than 100 years since the diversion was first created. Specifically, there is a need to understand what needs to be done in certain key areas such as on the South Bank for about 60 feet upstream of the main Canal intake, at the cutoff sills in terms of right and left hard anchor points at a stream channel TDB width and location, and in relation to re-establishment of a natural bank in front of the north-side retaining wall treatment for downstream bank and channel stability, and due to safety concerns.

In the very sensitive areas such as above, the existing Geomorphic Analysis needs some limited additional work to be complete and usuable; and then PGE needs to consult **jointly** with each private landowner and the Resource Agencies to confirm there is a reasonable consensus on all aspects of the structure removal strategy, before preparing the detailed design drawings, plans and specifications for that action.

In general at all infrastructure locations, PGE proposes to consult with each private landowner where strucutrures would be removed so as to determine the extent of their removal (at or below grade level), and to prepare detailed design plans and specifications for soil erosion and sedimentation control.

Attachment II

2.5 ACTION ALTERNATIVE 2 (AA2)

Under Action Alternative 2 (AA2), it is assumed that the necessary processes and legal agreements as discussed and set forth below would be put in place (c1) (c2) (a)(b) (c) such that the South Cow Creek main diversion dam, main canal, and penstock would be retained and maintained in order to enable a water delivery system to Hooten Gulch as one possible method to address the issue of the adjudicated water rights of the ADU. PG& E would decommission the Kilarc Development as described in the Proposed Action, and PG&E would implement all of the mitigation and enhancement measures proposed for that development. No power generation would occur at either project development.

In the Cow Creek Development, the Mill Creek diversion dam and canal and the Cow Creek powerhouse and switchyard would be decommissioned as described under PG& E's Proposed Action. The existing fish ladder and fish screen at the South Cow Creek diversion ladder would be removed, and a new fish passage facility that meets current standards would be designed and installed in place to improve upstream passage of migratory salmonids. Fish passage would be monitored during salmon and steelhead migratory periods. A new fish screen that meets current standards would be designed and installed at the entrance to the South Cow Creek main canal to block entrainment of resident and anadromous fish from South Cow creek into the canal. The Cow Creek forebay would be filled and graded through the former forebay area to the penstock intake. The penstock and tailrace would be maintained for discharge to Hooten Gulch.

The South Cow Creek diversion dam and canal intake would be modified as necessary to provide the main canal with a water flow per that water right (b) consistent with the various applicable statutes and well defined requirements of the California State Water Code; and any minimum bypass requirements of the Resource Agencies such as the CDFG. For the purpose of analysis of AA2, it is assumed that a diversion up to 20 cfs could be allowed (c1). All flows in excess of these requirements would be released to the South Cow Creek bypass reach below the diversion dam.

The above described water delivery infrastructure to the South Cow Creek power house rests on some PG&E lands, but principally on lands of other private landowners; none of whom belong to the ADU group of water users. (c) . Under the conditions of the LSA; and well known California real property law (c2) ; in order to keep and maintain this water delivery system, most specifically as one for a Agriculture and Domestic Use; any new interested entity would be required to develop and obtain new fundamental easements from each of the appropriate private land owners; first establishing basic right of use or presence of the defined infrastructure to exist or cross their lands. Such easements would need to address a host of issues. (d)

This alternative assumes that an interested entity with adequate financial resources can be identified to execute the preceding defined processes necessary to take over operation and maintenance of the remaining Cow Creek facilities, implementing improvements for fish passage, and conduct any

monitoring required by resource agencies. Under AA2, PGE would be responsible for decommissioning the Kilarc Development and those portions of the Cow Creek Development not required to provide water to Hooten Gulch. These facilities would be decommissioned as described in the Proposed Action. PG&E, and any other private land owner now having infrastructure on his lands; would not be responsible for the implementation of the upgrades to Project facilities, or the design and installation of fish passage facilities, or the costs of all legal processes necessary to achieve a Agricultural and domestic water use at the South Cow Creek Diversion 64, or any other such costs such as legal ones associated with the water rights processes; or for developing and obtaining the necessary easements, for example. Final Commission approval of the project surrender of license would be dependent upon completion of the conditions described for the Cow Creek and Kilarc Developments.

Comments & Footnotes:

(c1) DEIS correctly cites in Section 5.0, page 267, the Cow Creek Adjudication Decree, August 1969 as the principle reference for "water rights". It would be beneficial in the final EIS document if FERC staff would reflect and heed the guidance J. Parks (California SWRCB) gave in his comments at the FERC 7/14 meeting { Transcript pages 106-109; beginning page 107 / line 20 through page 108 / line 14}. If FERC staff has any general questions on the Adjudication, or any fundamental California water code issues, Mr. J. Parks, who is always most helpful, seems to be the appropriate first counsel for Staff to approach for guidance.

(c2) None of these other non PG&E land owners have water rights associated with this now existing PG,&E water delivery system; nor do they have any water rights associated with the ADU diversion, and those respective water rights. Analogous to the comments (c1) above as to how to properly document "water issues" in an EIS document; there is a similar situation with respect to fundamental "private property" law and its corollaries. For California, or for basic private property law in any State; it appears appropriate for FERC staff to have a short (1 hour?) tutorial from a FERC legal staff member on at least the basic precepts; and not dismiss and trivialize the issue by only citing "secondary" aspects of this type of legal "instrument."

(a) Assumes that the SWRCB and the California Courts would entertain and approve the motion of a new applicant to take and realize his legitimate water rights for a new expressed purpose at diversion 64

(b) At the present time the only water right adjudicated and allowed at Diversion 64 (c1) {South Cow Creek P-606 main diversion} is a non consumptive right belonging to the South Cow Priority Group now assigned solely to the PGE corporation. This right now is a "Power Use" one; limited to the hydro-dynamic applications required for the development of electrical energy. At the diversion 64 location, the Adjudication reflects no other waters rights belonging to others for any other Adjudicated use such as Agricultural, Domestic, or Industrial now defined and authorized by the California SWRCB and California Courts. The ADU (Diversion 73) water rights (1st, 2nd 3rd, 4th) belonging to the Lower Cow Creek priority group vary in flow volume and the Season; ie, (irrigation season / non irrigation season).

(c) None of these other non PG&E land owners have water rights associated with this now existing PG,&E water delivery system; nor do they have any water rights associated with the ADU diversion, and those respective water rights.

(d) An initial, but not wholly inclusive, list of easement clauses would include the following: specific rights of access, maintenance of access roads, maintenance of infrastructure, responsibility for taxes on the infrastructure, liability responsibility, minimum liability insurance requirements, mandatory bonds/insurance/collateral to cover infrastructure removal cost if the easement holder entity chose to quit or abandon the easements, etc.

Attachment III {Cultural Comments}

1. DEIS Tables 1 (EIS 1.4.2) & Tables 2 (1.4.3), and other "tables" should have the integrity to reflect in third column, were appropriate "Comments/Protest/**Recommendations**" and not just "Comments/Protest" because many of the Commenting Entities made "simple Recommendations" as to how to resolve the "issue". Excepting "Resource Agencies, there does not appear to be a single example of FERC adopting or pursuing the "Recommendation", or acknowledging that it was even done, no matter how simple and basic that Recommendation might have been.

* Above statement is also true for issues and subjects other than "Cultural".

2. Several individuals submitted "Comments", some supported by extensive detailed data, to address the issue of the **veracity and accuracy** of specific "Historical & Archaeological Surveys , Reports, & SHPO documents that have been completed for P-606, and made part of the LSA.

a. No text {1.4.4 or elsewhere}, or even the Appendix A-6 (Comments Table) addresses the "**Accuracy & Veracity**" issue. It appears that this issue has been summarily dismissed by Staff; or Staff did not even attempt to review "hard data", that was provided in support of the "Scoping Comments". The Commission, or any other DEIS reader, without also reading all the Documents in the P-606 database, would not even know the issue was raised.

3. It would be appreciated if FERC staff would revisit the "Comments/ Protest/Recommendations" and Scoping letters (with 9 pages of supporting data), on this specific subject that are dated 7/7/2009 & 10/14/2009 respectively.

4. Documents submitted in 2009 in response to the LSA , on the subject of the "Accuracy & Veracity" of the Ganda Reports, were phrased to try to correct a "problem" without embarrassment to that Company. This is because it is not clear to this writer that some of key problems are only their fault - possibly Licensee Staff ,or their some of their contractors in San Francisco Bay area fed Ganda incorrect data and information. However it is painfully obvious that this "approach" to the issue has made no impression on anyone at FERC, those associated with the developing an EIS, or the Licensee staff directly associated with the LSA. Therefore the next comments are not necessarily so polite.

{Ref. LSA Vol. 4 " GANDA Cultural Resources Inventory, Revised by Entrix, Inc; dated 3/12/2009}

a. Section 6.0 / Page 36: " **Cultural resource specialists conducted an intensive <u>pedestrian</u> cultural resources survey within the proposed APE…**"

*This statement has the distinct appearance of having been written with **the intent to mislead** knowing that it was very unlikely that any future readers would have first hand knowledge of the area. The statements simply **is not a factual one** that can be supported by the Report, or some of the various site SHPO documents if an independent "auditor" walked the APE, or they are read

and reviewed by an individual that has knowledge of the area.. Either the "resource specialists" have a fundamental eyesight problem, or they skipped over walking APE areas of significant length such as the Penstock, or even doing a "fast assessment walk in such areas". Simply invoking "**creative fictional report** writing" back in the comforts of the office is inappropriate for "Historical Surveys".

b. Section 6.0 / Page 38: " The site of this diversion was revisited in April 2008 **was found to be in the same condition as recorded,** except for Shoup'e Feature 5 - a stream crossing cable - that has been removed for safety reasons and was not found".

* In terms of accuracy and fundamental historical recording truthfulness, the above statement has an extremely unpleasant odor. Once again it seems that either this statement was concocted in some Bay area office, or surveyors did not visit this area, or surveyors were visually handicapped, or technically unqualified to review hydro project structures. The principle feature of this area, the "Timber Crib" diversion structure, that was surveyed by Shoupe in 1989; was removed and replaced that same year. Shoupe's report even says a replacement is going to happen. PGE well knows the dam was replaced, and 1989/90 documents in the FERC P-606 database also said it happened. The replacement "concrete capped crib dam in no way shape or form (exterior cross section) even remotely approximates the Timber Crib structure that was once there. How can a "professional or competent surveyor", or even an amateur, fail to observe this distinction and make the statement quoted above.

5. The FERC Processes triggered doing all these surveys. All the P-606 historical and SHPO reports have already administratively and efficiently been processed thru the California State historical Preservation Office (SHPO). These offices must presume that the recording were done with honesty, accuracy, and professional standards. These particular documents have already been assigned new file numbers and are in the CHRIS {California Historical Resource Information System}, a limited access system in Chico. The CHRIS centers can provide an invaluable resource for serious future historical research. It is extremely unfortunate that some of these documents for this P-606 project that are known to be "sloppy and misleading" for this project are now <u>contaminating</u> that database.

6. It is easy to take the position that there is no physical harm to anyone in Society at the present moment because that is in fact just about 100% true. The only potential harm is in the future in terms of harm to "Knowledge" and the opportunity for others to intelligently and accurately try to interpret "what was here" and what was the its impact on the environment then, as compared to their time. { If the data or text book is false - the knowledge imparted will often be false.}

a. As a possible example, please note the propagation of the corrupt message has already started: {See DEIS 3.3.11.1 page 221 bottom} description of Site 482-12-02H.

a-1: "a" above assumes a Contractor did the 100% regurgitation of the Ganda material, and only Ganda material for this part of the DEIS, without the benefit of any Scoping data submitted. At least this is what DEIS Section 5.0 implies in only citing the two Ganda/Siskin references.

a-2: If a FERC staff member, that participated in the Oct 2009 tour, and also had Scoping material already referenced in hand , wrote this section; then this not a good example of the Comment 6a type phenomena. However, if this is the case; then possibly the critique (4b*) above of Ganda surveyors is unjust & unwarranted as FERC staff members seem to suffer from like afflictions.

Attachment IV {General Miscellaneous Comments}

C1. Others have already commented on the accuracy of the DEIS text - specific description of features of the Abbott Ditch, for example {Poole}. Given how the LSA text is done, and the multitude of other text submitted in this proceeding, it is easily appreciated how difficult is for Staff to develop non-misleading or confusing text on a host of issues. Beyond the ADU area, and for a host of other different geographical areas; unfortunately within the DEIS there are many other examples, too numerous to itemize case by case. Some examples are:

a. LSA has been rightly criticized for lack of specific facts and data, but on the subject of "natural barriers" in the bypass regions, this does not seem to be a fair critique.

* EIS 3.3.2.1 / Page 84 & other pages discussing barriers locations seem to have errors:
  + Where did FERC staff get the number "nine" from? LSA Vol 3 / Appendix "A" certainly seems to be a reasonably competent assessment on the subject of "barriers" in the bypass regions. For South Cow, Nine total barriers (SC-1 thru Sc-9) are identified; 7 natural + 2 man-made, wherein SC-9 is the Project main diversion {PGE Div. 64} & SC-1 is Div.72 (Wagoner/Tetrick) water right. FYI, and additional information, there is one more natural barrier on South Cow within Wagoner Canyon that has very similar characteristics to that one shown as SC-7. It is upstream of the Project diversion (SC-9) about 100 yards from the entrance to Wagoner Canyon. It can be located as SC-Site5 in Fig. 2 LSA Vol.3. The other 7 natural barriers are concentrated in about ¼ of the length of Wagoner Canyon at the upper end of the lower ½ of the Canyon in a direction centered NW of the Forebay.{ LSA Vol 3/Figures Section / Figure 12}

* For many, Wagoner Canyon is normally considerd to begin (entrance) in the approximate center of the NE¼ of Section 33 about 1/3 mile upstream of the Project diversion; and its exit is in Section 6 about ½ mile upstream of South Cow's confluence with Hooten Gulch. It is a steep "V" Canyon with South Cow being relatively deep and narrow in width as is now the description in the DEIS. The primary exception to the steep V geometry description begins on the north canyon side at the Project diversion, and extends for about 300 yards; so as to receive the entering waters of Mill Creek. (South Cow / Mill creek confluence).

b. In much of the EIS, LSA, and other documents; the term "Hooten Gulch" has become synonymous with <u>only that 0.5 mile terminus</u> of this seasonal water system that is between the Powerhouse and Hooten's confluence with South Cow. For your additional perspective and understanding, almost ¼ of the total South Cow Creek watershed, that is only 'seasonal;" has its confluence with South Cow at low elevation below the exit of Wagoner Canyon. The primary tributaries making up this part of the Watershed are Hooten Gulch, Pine Timber Gulch, Townsend Gulch, Wilk Gulch, & Clough Gulch - all on the south side of SCC. All, except Hooten, cross the Abbott Ditch shortly before each has their confluence with South Cow. These tributaries terminus lengths come to South Cow in a northerly direction. Before then, most turn to the East and have their headwaters source far to the East (East of the entrance to Wagoner Canyon). Hooten Gulch, itself and its own tributaries comprise a combined length on the order of maybe 6 miles, with the northern boundary of

Hooten's watershed reasonably well approximated by much of FERC road "A" leading to the Forebay. {Reference any USGS map for this area or Figure 2 in LSA Vol. 3, or other maps in LSA}.

C2. The DEIS, often simply repeats from the LSA; vague and often questionable text that should attempt to truly and accurately describe the now existing real physical state for a variety of areas. This is not necessarily a technique appreciated by many - this individual included. Text written to be intentionally "loosey goosey" simply for the purpose of providing future "backside" cover for any possible future detailed action plans put forward, or negative outcome no longer is appropriate. This comment applies to any and all Alternatives already put forward {not just the proposed Action} ; or any new ones that may be forth coming.

C3. Analougous to comment C2 above, is FERC's apparent lack of any standards or criteria for License related documents concerning information submitted in reports or documents in terms of completeness, accuracy, and veracity. FERC staff appears to endorse documents that have been submitted in the LSA that are shown to be significantly in error, have omitted data, or have reduced data so it literally useless for valid analysis. DEIS now takes a total "Don't care" approach on these situations; and dismisses them as unimportant and an attitude of " I'll think about that tomorrow" (GWTW 1939).

a. It is noted that the Kilarc Geomophic NSR, Inc Report 2008 is referenced in DEIS Section 5.0 "Literature Cited". **Why isn't the equivalent Cow Creek NSR Geomorphic Report cited in Section 5.0?** , or other analysis? One assumes at least someone attempted to critique the Cow Creek NSR Report - or at least attempted to read the very "Crude & Preliminary 9 pages of Scoping Comments submitted in response to that Report. That latter analysis was constrained to be a fast initial attempt to illustrate, at a minimum, other factors that should be in a "Geomorphic Analysis" for a dam removal. Removal of dams involves more than just "Impounded Sedimendation & Transport" analysis.

b. FERC processes seem to have no simple " admendment" or update process to correct inadvertent documentation oversights, typo's or mistakes.

* S--- happens! / Mistakes happen! - this is the real world. There should be a process to rectify this type of thing in a timely manner, w/o upsetting the the supposed " FERC Process". Extremely lengthy, questionably organized Draft documents { DLSA / DEIS / etc.} make valid comprehensive critique, and useful valid commenting, almost an impossibility.

c. Accurate problem (issue) definition; and the establishment of clear "Objectives" to best solve the problem are essential for an optimum and successful outcome! It is the core principle that the most successful private companies practice religiously. It can be phrased in a variety of ways & rules. Some are:

* Quality in → Quality Out or the inverse * Garbage in → Garbage Out
* Never Lie no matter what the subject (Accounting, Technical Problem, etc.) - especially to yourself because it is likely that you will eventually only confuse yourself and cause your own self harm or failure.
* For very new and novel situations, take more time upfront to set clear objectives / document well the next Process / monitor & properly document the result over and above normal practice. This practice can also be described as: For new or novel situations - invoke in advance over and above NBP, the key Principles of " Lessons Learned" !

ATTACHMENT IV

David W. Albrecht
198 Sprucemont Place
San Jose, CA. 95139

July 7, 2009

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 - 1st Street, N.E.
Washington, DC 20426-0001

Ref: P-606-027-CA, Kilarc-Cow Creek Hydroelectric Project
Application for Surrender of License by
Licensee Pacific Gas and Electric Company

Re: **COMMENTS / PROTEST / RECOMMENDATIONS**
for South Cow Creek Diversion Dismantling Plans

Dear Ms. Bose:

COMMENTS:

The Pacific Gas and Electric Corporation submitted its License Surrender Application (LSA) for its FERC Project P-606 on March 12, 2009. The Licensee has requested that the Commission endorse and approve the Application; and seeks an order to begin detailed engineering proposals for removal of various specific infrastructure in specific areas of the Project.

One such structure is the South Cow Creek Dam that is located on our private lands as a consequence of a deeded easement to the Northern Light & Power Company in 1907 by the former owner of the property.

Detailed engineering proposals are, and should be developed, based on quantitative specifications and objectives; together with other physical attributes and constraints of specific infrastructure and the germane characteristics of the area involved. This Engineer's personal perspective is that in practice within the FERC processes, those PM&E measures encompassing such environmental disciplines such as Geology (GEOL), Geomorphology (GEOM), Aquatic (AQUA), Wildlife, Botanical, etc. become the actual specified objectives and constraining environmental specifications that the detailed engineering plan must satisfy and conform to.

For the South Cow Creek Dam, those PM&E proposals that have been developed for the LSA are in general excellent, given the specific information and data that was made available by the Licensee in the Preliminary Plan (9/2007) and Draft Plan (9/2008). However for multiple reasons: (including incorrect information, casual data analysis, missing data, misleading descriptive information, miscommunication,

etc.); these PM&E measures are not yet comprehensive or complete. For no justifiable reason, the likely **(High Probability)** outcome and consequence of this deficiency is permanent and irreparable damage to our lands and the South Cow Creek channel. Moreover, it puts at significant risk the fundamental objective for removing this hydro project which is to establish an improved, permanent, stable, and reliable channel for future upstream fish passage.

PROTEST

With respect to all those issues, but just those issues, associated with the South Cow Dam in the LSA, at this time the landowners wish to Protest this Application being summarily approved with out additional review. Such review should be possible in a Scoping meeting, or other equivalent forum chaired by FERC.

RECOMMENDATONS

Stakeholders whose private lands are being put at undue Risk, because of the questionable assumptions, information, and plans now set forth in the LSA, should have the opportunity to present their technical analysis as to why additional PM&E's are needed before Licensee is allowed to proceed to the next stage of the Decommissioning Process.

Much of that proposed analysis is of a very detailed technical nature; requiring free dialog between all parties involved. It is suggested that possibly the best way to address the issues at hand, is that there first be a shorter general overview meeting, coupled with a much more detailed and technical follow-up Workshop, and then a Wrap-up meeting. In a Workshop environment, it is easier to have a free exchange of information and input from the perspective of all parties. Please refer to attachment I for addition Comments. There are two other attachments (II & III) provided for the readers convenience. Attachment II is an example of the type of factual material to be presented , discussed, and debated . Attachment III is essentially the same information package that I generated in great haste in October 2008.

Sincerely,

David W. Albrecht,
Landowner, Stakeholder

Encl: Atch I, II & III

cc: Resource agencies per Atch I
P,G & E

Attachment I

COMMENTS:

1. Key Resource Agencies provided with copy of material.

Calif. Dept. of Fish & Game
Northern Region
Attn: Matt Myers
601 Locust Street
Redding CA. 96001

National Marine Fisheries Service
Attn: S. Edmondson / D. White
777 Sonoma Ave. Suite 325
Santa Rosa, CA. 95403-6528

U.S. Fish & Wildlife Service
Attn: William Foster
2800 Cottage Way, Rm W-2605
Sacramento, CA. 95821-6340

U.S. Army Corp of Engineers
152 Hartnell Ave.
Redding, CA. 96002-1842

P,G & E
Attn. Charles White
MC: 11C
P.O. Box 770000
San Francisco, CA 64177

2. Technical Workshop would be most effective if all key agencies represented ~~with~~ nad more than one representative if appropriate. For example for NMFS; Dave White and an individual such as Dr. Brian Cluer. If FERC, has a technical resource individual with expertise in geomorphology (geomorphic stability, fluvial transport), especially one who possibly has worked with the Bureau of Reclamation technical staff on dam removals, the insights of such an individual would be of great value. All private landowners whose lands will be involved in the Dam removal should be invited to attend. One of the landowners has long time practical experience and insights to the nature of the South Cow Creek water flows.

3. Primary Objective of Workshop should be to ensure all the technical objectives and desired outcomes are well defined and established with said objectives supported by sound data analysis. It should not be intended to define and finalize a set of precise engineering means to effect that result.

4. This stakeholder continues to remain sincerely committed to those objectives as set forth on page 1 of Attachment III. However, it is essential that ALL the correct technical objectives be clearly defined with some degree of technical rigor.

5. If questions, please feel free to contact me; e-mail address: dtalbrecht@sbcglobal.net

ORIGINAL

ATTACHMENT V

198 Sprucement Place
San Jose, CA 95139
19 August 2010

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 - 1st Street, NE, Mail Code PJ-12.1 due 9/14/10
Washington, DC 20426

Ref: FERC Project P-606-027 {Draft Environment Impact Statement (DEIS) dated June 22, 2010

Dear Ms. Bose:

The comments below are in response to the P-606 DEIS referenced above, and as a result of other FERC Public meetings held in Shasta County on 7/14 and 8/17/2010 on the same subject. The EIS process has been initiated by FERC in response to concerns with the 3/12/2009 LSA that Licensee has submitted that proposes decommissioning of the Kilarc and Cow Creek Hydro facilities. Comment due date for the DEIS was originally established to 8/9/2010 but was extended 8/25/2010.

1. The DEIS document structure is a lengthy and tedious structure for the average layman (1), to find and locate all points relative to his specific concerns. {(1) self included} However, with patience and perseverance; it is a situation that one can adabt to. To put the preceding into perspective; by comparison, the DSLA was significantly worse; and even with eventual editing and corrections in the LSA; this document is still difficult to reference for specific information on a given topic.

a. Staff has done a reasonably good effort of separating and isolating those issues associated with the Kilarc Development from those associated with the (South) Cow Creek Development; and then doing independent Analysis for each. Working from the structure of the LSA; and sometimes the comments given verbally or in writing by individuals, does not always make this an easy task. If one terms one P-606 Development "A", and the other "B"; please continue to separate informational input and data submitted into either "A" or "B" buckets; although in some situations it can be appropriate to do an "A + B" bucket. All too often statements, data, or a hypothesis is presented with respect to one of the Developments; and the concluson is made with respect to both {"This situation on A is true, therefore it is implied that it is true for both A+B"; or "this is true on B, therefore it is true on both A+B."}

2. However, it also appears to be fair to say that general consensus of those in Shasta County is that the DEIS, in its present form is seriously "deficient"; to use a polite phrase. {Public meeting had words like: "disappointed", "angry about it", "F grade", "if we put together a document like this we'd get laughed out of the court system", etc.}. It may not have been intended; but the DEIS, in its choice of text, and findings do not convey very well that it has been developed in an impartial way. Some new examples:

a. Section 4.3 (Page 263) or Executive Summary (Page xx) has a very short list of just three additional environmental measures that need to be included for the proposed Surrender Order. That is a very short list compared to the host of environmental issues raised by many. There are issues that the now existing LSA does not seem to address; either "by reasonable impartial scientific analysis , or other means; or by competent & complete reports; or by putting forth a document that has basic and sincere veracity in attempting to describe the now existing physical environment for the Project. Now the DEIS seems to be following in the same path.

* The term " Consultation" as used in the DEIS , or LSA, or anywhere in this FERC Process has become a bad joke with respect to reflecting that any meaningful consultations were actually completed, or any useful outcome was achieved.

* It seems to be acceptable that the guidelines for "veracity " can be interpreted for any documents developed for FERC Processes to fall under the same loose guidelines used for Political Campaign Ads where one Candidate can disparage another with statements in Sound-bites or Flyers that are "Not untrue" from a legal libel basis , but the statement makes no effort to have "veracity" with respect to all facts germane to a situation. While this a way of life in the Political arena, this is an unfortunate philosophy to adopt for a FERC process such as this. one.

* Most are left with the impression that Staff seems to take the position that all reports in the LSA have been completed with total accuracy and zero mistakes; or all positions taken in the LSA are environmentally not subject to challenge because the Licensee Staff and/or Resource Agencies have been endowed with some sort of omnipotent status and divine wisdom from above; and therefore any position developed by them is whole and complete by definition needing zero further review or work. It seems to make no diffference if a report needed for a valid analysis is inaccurate or fundamentally incomplete. Those situations are being swept under the rug.

b. While the thoughts expressed in Section 3.3.8.2 (page 179) may be well intended, the text from my point of view does not accurately reflect the entire scope of those Scoping Comments, dated 10/14/2009. These comments were submitted to address what needs to be done in terms of completing a valid "Geomorphic Analysis"; and establishing improved objectives for infrastructure removal at the Cow Creek Diversion area. This work needs to be accomplished before embarking on the more costly effort of developing detailed design plans and specifications. {Engineers are not clairvoyant}. **Please see Attachment I, page 4 , as one of many possible ways to revise the text.**

* It doesn't seem ureasonable that there should be a bullet in Section 4.3; etal that states something like the following: " Some additional geomorphic analysis actions for the Cow Creek diversion area as outlined in Section 3.3.8.2 needs to be done. That effort involves PG&E, private land owners, and the Resource Agencies; and establishing more specific outcome objectives for a preferred long term stable hydrograph; all before embarking on developing detailed design plans and specifications for removing the dam.

3. FERC Staff developed in the DEIS their own Action Alternatives {AA1 & AA2} - specific Alternatives that it seems unlikely anyone in Shasta County anticipated would be in the DEIS. This writer does not wish to debate the relative merits of either; or how appropriate the choice of these Alternatives may be. However, if these are to be the principle reasonable Alternatives; then I do not believe they have been defined or qualified very well. All key State Processes to make them possible, or truly a possible reality, need to be well understood. In short, the defining text now in many ways is somewhat casual and superficial. **Please refer to Attachment II, pages 5 & 6, for an illustration of would be one approach to better qualify AA2.** AA1 has similar deficencies, but to a significantly lesser degree. Staff can reference the 3/2008 PGE document on Kilarc as a Recreation Facility to at least understand the simple text needed where legal processes are required.

4. Despite documentation submitted in July and October; FERC staff seems to have zero concerns that some of the Project Historical Surveys are very sub-standard and inaccurate. Some fundamentally fail basic veracity standards; and one key deficiency in terms of misinformation is already being propagated in the DEIS text. The July 2009 document provided a simple "Recommendation" to fix the problems, but apparently FERC feels that that action is not required or necessary. It seems it is of no concern to this Commission whether or not reports triggered by a FERC Surrender Application are in fact factual. Efforts to rectify some of the deficient Surveys in the beginning of 2009, by meeting with the Contractor that did them, were stonewalled by Licensee staff in San Francisco because they told the Contractor that it "was against FERC Protocol". Basically all text in the DEIS is nothing more than 100% reguritation of Ganda text from their report and SHPO documents. The meaning of FERC Protocol is certainly now taking on a very clear meaning; in terms of its no action attitude on deficient "historical surveys". **Please see Attachment III, pages 7 & 8, for additional comments on Cultural Resources.** If FERC Staff does not wish to address a process to correct these deficiencies in Cultural Resource Reports, will they please have the courtesy to correct the text in Section 3.3.11.1, page 221; on Site 482-12-02H.

5. **Additional miscellaneous comments are to be found in Attachment IV, pages 9 & 10**

6. Much of what seems to be at the center of concern for many, including myself seems to center around the need for improved "Veracity" from all involved. I would also suggest that some problems definitely stem from FERC itself in not having the proper standards for a LSA and decommissioning of infrastructure. The Process for a "License Surrender" now being defined as only a "License Applications in Reverse" with no special standards for such thing as "infrastructure removal" or Historical Surveys of 100% of the APE, or possibly a different time table; is a very poor and inadequate Process guideline. Decommissioning Projects is at least 15 years old now, and the fact that the above hasn't been recognized and responded to, is troubling.

7. I will apologize in advance for some of the less than polite text of this letter.

Thank you for at least allowing "Comments and Critique"

David W. Albrecht

David W. Albrecht, Landowner with Project Infrastucture

Attachment I

Section 3.3.8.2 (Page 179 -starting as shown below) * New or revised text is underlined. Paragraph beginning at the bottom of page has been split and reworded as below.

One individual expressed concern, in comments dated October 14, 2009, about the necessity of having a **valid**, complete, and usable 'Geomorphic Analysis" in very sensitive areas such as the dam site on South Cow Creek to ensure the responsible treatment of private lands during disposition of project facilities with the Proposed Action; and that there is a post decommissioning hydrograph that best achieves the stable fish passage requirements and goals of the Resource Agencies. The individual commented that reasonable preventative or relatively simple proactive measures need to be invoked on his property at the South Cow Creek dam when it is removed to establish a desireable hydrograph that is stable so as to inhibit and preclude abnormal channel depth walking upstream and jeopardizing now existing channel banks that have adapted and become 100% stable for more than 100 years since the diversion was first created. Specifically, there is a need to understand what needs to be done in certain key areas such as on the South Bank for about 60 feet upstream of the main Canal intake, at the cutoff sills in terms of right and left hard anchor points at a stream channel TDB width and location, and in relation to re-establishment of a natural bank in front of the north-side retaining wall treatment for downstream bank and channel stability, and due to safety concerns.

In the very sensitive areas such as above, the existing Geomorphic Analysis needs some limited additional work to be complete and usuable; and then PGE needs to consult **jointly** with each private landowner and the Resource Agencies to confirm there is a reasonable consensus on all aspects of the structure removal strategy, before preparing the detailed design drawings, plans and specifications for that action.

In general at all infrastructure locations, PGE proposes to consult with each private landowner where strucutrures would be removed so as to determine the extent of their removal (at or below grade level), and to prepare detailed design plans and specifications for soil erosion and sedimentation control.

Attachment II

2.5 ACTION ALTERNATIVE 2 (AA2)

Under Action Alternative 2 (AA2), it is assumed that the necessary processes and legal agreements as discussed and set forth below would be put in place (c1) (c2) (a)(b) (c) such that the South Cow Creek main diversion dam, main canal, and penstock would be retained and maintained in order to enable a water delivery system to Hooten Gulch as one possible method to address the issue of the adjudicated water rights of the ADU. PG& E would decommission the Kilarc Development as described in the Proposed Action, and PG&E would implement all of the mitigation and enhancement measures proposed for that development. No power generation would occur at either project development.

In the Cow Creek Development, the Mill Creek diversion dam and canal and the Cow Creek powerhouse and switchyard would be decommissioned as described under PG& E's Proposed Action. The existing fish ladder and fish screen at the South Cow Creek diversion ladder would be removed, and a new fish passage facility that meets current standards would be designed and installed in place to improve upstream passage of migratory salmonids. Fish passage would be monitored during salmon and steelhead migratory periods. A new fish screen that meets current standards would be designed and installed at the entrance to the South Cow Creek main canal to block entrainment of resident and anadromous fish from South Cow creek into the canal. The Cow Creek forebay would be filled and graded through the former forebay area to the penstock intake. The penstock and tailrace would be maintained for discharge to Hooten Gulch.

The South Cow Creek diversion dam and canal intake would be modified as necessary to provide the main canal with a water flow per that water right (b) consistent with the various applicable statutes and well defined requirements of the California State Water Code; and any minimum bypass requirements of the Resource Agencies such as the CDFG. For the purpose of analysis of AA2, it is assumed that a diversion up to 20 cfs could be allowed (c1). All flows in excess of these requirements would be released to the South Cow Creek bypass reach below the diversion dam.

The above described water delivery infrastructure to the South Cow Creek power house rests on some PG&E lands, but principally on lands of other private landowners; none of whom belong to the ADU group of water users. (c) . Under the conditions of the LSA; and well known California real property law (c2) ; in order to keep and maintain this water delivery system, most specifically as one for a Agriculture and Domestic Use; any new interested entity would be required to develop and obtain new fundamental easements from each of the appropriate private land owners; first establishing basic right of use or presence of the defined infrastructure to exist or cross their lands. Such easements would need to address a host of issues. (d)

This alternative assumes that an interested entity with adequate financial resources can be identified to execute the preceding defined processes necessary to take over operation and maintenance of the remaining Cow Creek facilities, implementing improvements for fish passage, and conduct any

monitoring required by resource agencies. Under AA2, PGE would be responsible for decommissioning the Kilarc Development and those portions of the Cow Creek Development not required to provide water to Hooten Gulch. These facilities would be decommissioned as described in the Proposed Action. PG&E, and any other private land owner now having infrastructure on his lands; would not be responsible for the implementation of the upgrades to Project facilities, or the design and installation of fish passage facilities, or the costs of all legal processes necessary to achieve a Agricultural and domestic water use at the South Cow Creek Diversion 64, or any other such costs such as legal ones associated with the water rights processes; or for developing and obtaining the necessary easements, for example. Final Commission approval of the project surrender of license would be dependent upon completion of the conditions described for the Cow Creek and Kilarc Developments.

Comments & Footnotes:

(c1) DEIS correctly cites in Section 5.0, page 267, the Cow Creek Adjudication Decree, August 1969 as the principle reference for "water rights". It would be beneficial in the final EIS document if FERC staff would reflect and heed the guidance J. Parks (California SWRCB) gave in his comments at the FERC 7/14 meeting { Transcript pages 106-109; beginning page 107 / line 20 through page 108 / line 14}. If FERC staff has any general questions on the Adjudication, or any fundamental California water code issues, Mr. J. Parks, who is always most helpful, seems to be the appropriate first counsel for Staff to approach for guidance.

(c2) None of these other non PG&E land owners have water rights associated with this now existing PG,&E water delivery system; nor do they have any water rights associated with the ADU diversion, and those respective water rights. Analogous to the comments (c1) above as to how to properly document "water issues" in an EIS document; there is a similar situation with respect to fundamental "private property" law and its corollaries. For California, or for basic private property law in any State; it appears appropriate for FERC staff to have a short (1 hour?) tutorial from a FERC legal staff member on at least the basic precepts; and not dismiss and trivialize the issue by only citing "secondary" aspects of this type of legal "instrument."

(a) Assumes that the SWRCB and the California Courts would entertain and approve the motion of a new applicant to take and realize his legitimate water rights for a new expressed purpose at diversion 64

(b) At the present time the only water right adjudicated and allowed at Diversion 64 (c1) {South Cow Creek P-606 main diversion} is a non consumptive right belonging to the South Cow Priority Group now assigned solely to the PGE corporation. This right now is a "Power Use" one; limited to the hydro-dynamic applications required for the development of electrical energy. At the diversion 64 location, the Adjudication reflects no other waters rights belonging to others for any other Adjudicated use such as Agricultural, Domestic, or Industrial now defined and authorized by the California SWRCB and California Courts. The ADU (Diversion 73) water rights (1st, 2nd 3rd, 4th) belonging to the Lower Cow Creek priority group vary in flow volume and the Season; ie, (irrigation season / non irrigation season).

(c) None of these other non PG&E land owners have water rights associated with this now existing PG,&E water delivery system; nor do they have any water rights associated with the ADU diversion, and those respective water rights.

(d) An initial, but not wholly inclusive, list of easement clauses would include the following: specific rights of access, maintenance of access roads, maintenance of infrastructure, responsibility for taxes on the infrastructure, liability responsibility, minimum liability insurance requirements, mandatory bonds/insurance/collateral to cover infrastructure removal cost if the easement holder entity chose to quit or abandon the easements, etc.

Attachment III {Cultural Comments}

1. DEIS Tables 1 (EIS 1.4.2) & Tables 2 (1.4.3), and other "tables" should have the integrity to reflect in third column, were appropriate "Comments/Protest/**Recommendations**" and not just "Comments/Protest" because many of the Commenting Entities made "simple Recommendations" as to how to resolve the "issue". Excepting "Resource Agencies, there does not appear to be a single example of FERC adopting or pursuing the "Recommendation", or acknowledging that it was even done, no matter how simple and basic that Recommendation might have been.

* Above statement is also true for issues and subjects other than "Cultural".

2. Several individuals submitted "Comments", some supported by extensive detailed data, to address the issue of the **veracity and accuracy** of specific "Historical & Archaeological Surveys , Reports, & SHPO documents that have been completed for P-606, and made part of the LSA.

a. No text {1.4.4 or elsewhere}, or even the Appendix A-6 (Comments Table) addresses the "**Accuracy & Veracity**" issue. It appears that this issue has been summarily dismissed by Staff; or Staff did not even attempt to review "hard data", that was provided in support of the "Scoping Comments". The Commission, or any other DEIS reader, without also reading all the Documents in the P-606 database, would not even know the issue was raised.

3. It would be appreciated if FERC staff would revisit the "Comments/ Protest/Recommendations" and Scoping letters (with 9 pages of supporting data), on this specific subject that are dated 7/7/2009 & 10/14/2009 respectively.

4. Documents submitted in 2009 in response to the LSA , on the subject of the "Accuracy & Veracity" of the Ganda Reports, were phrased to try to correct a "problem" without embarrassment to that Company. This is because it is not clear to this writer that some of key problems are only their fault - possibly Licensee Staff ,or their some of their contractors in San Francisco Bay area fed Ganda incorrect data and information. However it is painfully obvious that this "approach" to the issue has made no impression on anyone at FERC, those associated with the developing an EIS, or the Licensee staff directly associated with the LSA. Therefore the next comments are not necessarily so polite.

{Ref. LSA Vol. 4 " GANDA Cultural Resources Inventory, Revised by Entrix, Inc; dated 3/12/2009}

a. Section 6.0 / Page 36: " **Cultural resource specialists conducted an intensive <u>pedestrian</u> cultural resources survey within the proposed APE…**"

*This statement has the distinct appearance of having been written with **the intent to mislead** knowing that it was very unlikely that any future readers would have first hand knowledge of the area. The statements simply **is not a factual one** that can be supported by the Report, or some of the various site SHPO documents if an independent "auditor" walked the APE, or they are read

and reviewed by an individual that has knowledge of the area.. Either the "resource specialists" have a fundamental eyesight problem, or they skipped over walking APE areas of significant length such as the Penstock, or even doing a "fast assessment walk in such areas". Simply invoking "**creative fictional report** writing" back in the comforts of the office is inappropriate for "Historical Surveys".

b. Section 6.0 / Page 38: " The site of this diversion was revisited in April 2008 **was found to be in the same condition as recorded,** except for Shoup'e Feature 5 - a stream crossing cable - that has been removed for safety reasons and was not found".

* In terms of accuracy and fundamental historical recording truthfulness, the above statement has an extremely unpleasant odor. Once again it seems that either this statement was concocted in some Bay area office, or surveyors did not visit this area, or surveyors were visually handicapped, or technically unqualified to review hydro project structures. The principle feature of this area, the "Timber Crib" diversion structure, that was surveyed by Shoupe in 1989; was removed and replaced that same year. Shoupe's report even says a replacement is going to happen. PGE well knows the dam was replaced, and 1989/90 documents in the FERC P-606 database also said it happened. The replacement "concrete capped crib dam in no way shape or form (exterior cross section) even remotely approximates the Timber Crib structure that was once there. How can a "professional or competent surveyor", or even an amateur, fail to observe this distinction and make the statement quoted above.

5. The FERC Processes triggered doing all these surveys. All the P-606 historical and SHPO reports have already administratively and efficiently been processed thru the California State historical Preservation Office (SHPO). These offices must presume that the recording were done with honesty, accuracy, and professional standards. These particular documents have already been assigned new file numbers and are in the CHRIS {California Historical Resource Information System}, a limited access system in Chico. The CHRIS centers can provide an invaluable resource for serious future historical research. It is extremely unfortunate that some of these documents for this P-606 project that are known to be "sloppy and misleading" for this project are now <u>contaminating</u> that database.

6. It is easy to take the position that there is no physical harm to anyone in Society at the present moment because that is in fact just about 100% true. The only potential harm is in the future in terms of harm to "Knowledge" and the opportunity for others to intelligently and accurately try to interpret "what was here" and what was the its impact on the environment then, as compared to their time. { If the data or text book is false - the knowledge imparted will often be false.}

a. As a possible example, please note the propagation of the corrupt message has already started: {See DEIS 3.3.11.1 page 221 bottom} description of Site 482-12-02H.

a-1: "a" above assumes a Contractor did the 100% regurgitation of the Ganda material, and only Ganda material for this part of the DEIS, without the benefit of any Scoping data submitted. At least this is what DEIS Section 5.0 implies in only citing the two Ganda/Siskin references.

a-2: If a FERC staff member, that participated in the Oct 2009 tour, and also had Scoping material already referenced in hand , wrote this section; then this not a good example of the Comment 6a type phenomena. However, if this is the case; then possibly the critique (4b*) above of Ganda surveyors is unjust & unwarranted as FERC staff members seem to suffer from like afflictions.

Attachment IV {General Miscellaneous Comments}

C1. Others have already commented on the accuracy of the DEIS text - specific description of features of the Abbott Ditch, for example {Poole}. Given how the LSA text is done, and the multitude of other text submitted in this proceeding, it is easily appreciated how difficult is for Staff to develop non-misleading or confusing text on a host of issues. Beyond the ADU area, and for a host of other different geographical areas; unfortunately within the DEIS there are many other examples, too numerous to itemize case by case. Some examples are:

a. LSA has been rightly criticized for lack of specific facts and data, but on the subject of "natural barriers" in the bypass regions, this does not seem to be a fair critique.

* EIS 3.3.2.1 / Page 84 & other pages discussing barriers locations seem to have errors:
  + Where did FERC staff get the number "nine" from? LSA Vol 3 / Appendix "A" certainly seems to be a reasonably competent assessment on the subject of "barriers" in the bypass regions. For South Cow, Nine total barriers (SC-1 thru Sc-9) are identified; 7 natural + 2 man-made, wherein SC-9 is the Project main diversion {PGE Div. 64} & SC-1 is Div.72 (Wagoner/Tetrick) water right. FYI, and additional information, there is one more natural barrier on South Cow within Wagoner Canyon that has very similar characteristics to that one shown as SC-7. It is upstream of the Project diversion (SC-9) about 100 yards from the entrance to Wagoner Canyon. It can be located as SC-Site5 in Fig. 2 LSA Vol.3. The other 7 natural barriers are concentrated in about ¼ of the length of Wagoner Canyon at the upper end of the lower ½ of the Canyon in a direction centered NW of the Forebay.{ LSA Vol 3/Figures Section / Figure 12}

* For many, Wagoner Canyon is normally considerd to begin (entrance) in the approximate center of the NE¼ of Section 33 about 1/3 mile upstream of the Project diversion; and its exit is in Section 6 about ½ mile upstream of South Cow's confluence with Hooten Gulch. It is a steep "V" Canyon with South Cow being relatively deep and narrow in width as is now the description in the DEIS. The primary exception to the steep V geometry description begins on the north canyon side at the Project diversion, and extends for about 300 yards; so as to receive the entering waters of Mill Creek. (South Cow / Mill creek confluence).

b. In much of the EIS, LSA, and other documents; the term "Hooten Gulch" has become synonymous with <u>only that 0.5 mile terminus</u> of this seasonal water system that is between the Powerhouse and Hooten's confluence with South Cow. For your additional perspective and understanding, almost ¼ of the total South Cow Creek watershed, that is only 'seasonal;" has its confluence with South Cow at low elevation below the exit of Wagoner Canyon. The primary tributaries making up this part of the Watershed are Hooten Gulch, Pine Timber Gulch, Townsend Gulch, Wilk Gulch, & Clough Gulch - all on the south side of SCC. All, except Hooten, cross the Abbott Ditch shortly before each has their confluence with South Cow. These tributaries terminus lengths come to South Cow in a northerly direction. Before then, most turn to the East and have their headwaters source far to the East (East of the entrance to Wagoner Canyon). Hooten Gulch, itself and its own tributaries comprise a combined length on the order of maybe 6 miles, with the northern boundary of

Hooten's watershed reasonably well approximated by much of FERC road "A" leading to the Forebay. {Reference any USGS map for this area or Figure 2 in LSA Vol. 3, or other maps in LSA}.

C2. The DEIS, often simply repeats from the LSA; vague and often questionable text that should attempt to truly and accurately describe the now existing real physical state for a variety of areas. This is not necessarily a technique appreciated by many - this individual included. Text written to be intentionally "loosey goosey" simply for the purpose of providing future "backside" cover for any possible future detailed action plans put forward, or negative outcome no longer is appropriate. This comment applies to any and all Alternatives already put forward {not just the proposed Action} ; or any new ones that may be forth coming.

C3. Analougous to comment C2 above, is FERC's apparent lack of any standards or criteria for License related documents concerning information submitted in reports or documents in terms of completeness, accuracy, and veracity. FERC staff appears to endorse documents that have been submitted in the LSA that are shown to be significantly in error, have omitted data, or have reduced data so it literally useless for valid analysis. DEIS now takes a total "Don't care" approach on these situations; and dismisses them as unimportant and an attitude of " I'll think about that tomorrow" (GWTW 1939).

a. It is noted that the Kilarc Geomophic NSR, Inc Report 2008 is referenced in DEIS Section 5.0 "Literature Cited". **Why isn't the equivalent Cow Creek NSR Geomorphic Report cited in Section 5.0?** , or other analysis? One assumes at least someone attempted to critique the Cow Creek NSR Report - or at least attempted to read the very "Crude & Preliminary 9 pages of Scoping Comments submitted in response to that Report. That latter analysis was constrained to be a fast initial attempt to illustrate, at a minimum, other factors that should be in a "Geomorphic Analysis" for a dam removal. Removal of dams involves more than just "Impounded Sedimendation & Transport" analysis.

b. FERC processes seem to have no simple " admendment" or update process to correct inadvertent documentation oversights, typo's or mistakes.

* S--- happens! / Mistakes happen! - this is the real world. There should be a process to rectify this type of thing in a timely manner, w/o upsetting the the supposed " FERC Process". Extremely lengthy, questionably organized Draft documents { DLSA / DEIS / etc.} make valid comprehensive critique, and useful valid commenting, almost an impossibility.

c. Accurate problem (issue) definition; and the establishment of clear "Objectives" to best solve the problem are essential for an optimum and successful outcome! It is the core principle that the most successful private companies practice religiously. It can be phrased in a variety of ways & rules. Some are:

* Quality in → Quality Out or the inverse * Garbage in → Garbage Out
* Never Lie no matter what the subject (Accounting, Technical Problem, etc.) - especially to yourself because it is likely that you will eventually only confuse yourself and cause your own self harm or failure.
* For very new and novel situations, take more time upfront to set clear objectives / document well the next Process / monitor & properly document the result over and above normal practice. This practice can also be described as: For new or novel situations - invoke in advance over and above NBP, the key Principles of " Lessons Learned" !

198 Sprucemont

Place

San Jose, CA. 95139

21 April 2013

Jeffry Parks
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA. 95812-2000

Re: Kilarc-Cow Creek

{FERC P-606) CEQA

Ref: P-606 Biological

Evaluation Draft August 2009

Jeff,

1. I urge you and your staff to reference the P-606 Biological Evaluation Document {FERC # 20090827-5009 }, in addition to the LSA, FERC EIS; and other documents in this Process. Let me make a few comments on this particular document.

2. Section 2.2, **Project Purpose and Objectives**: Great set of five bullets, especially the 5th if it was meant to include in addition to the conveyance facilities and forebays; the diversion structures that are actually in stream beds.

" Decommission all conveyance facilities and forebays in an environmentally sound manner."

3. Section 1.1 on **Regulatory Overview** seems to be an excellent summary of various past Process stages, and the CEQA stage now beginning.

4. Section 1.2 **Project History** is also very informative, especially the conclusion of the first paragraph that ends on Page 1-3 with:

" Pursuant the Agreement, PG&E, among other things, agreed not to file an application for a new license
by the statutory deadline of March 27, 2005, and instead agree to support decommissioning of the Project. In exchange, the other signatories agreed to support a scope of decommissioning that would address specified subjects but would provide PG&E flexibility to address these subjects in the most cost-effective manner."

5. Page 1.3, **Federal Action History,** seems complete; and illustrates quite well how such exclusionary processes evolve such a questionable set of objectives, and PM&E's {My comment letter of 19 April 2013 - paragraph 1, and Attachment IV}.

6. See Section 2.3.1.1: Second paragraph is quite insufficient; but for the official record: The next to last sentence in paragraph two is a deliberate falsehood. Licensee by late October, early November 2008 had more than sufficient documentation with respect to what my position was on this side of the dam with respect to trying to create the conditions that would re-establish some resemblance of the pre-dam bank.

7. One has to seriously wonder where some of the statements and numbers in this Process come from,

and what was the writers assumption in making those statement. For example later in Section 2.3.1.1, page 2-4, on **Avoidance and Minimization Measures** sub-paragraph 2) :

"It is estimated that up to 400 feet of stream channel may need to be dewatered to remove the dam and excavate the pilot thalweg channel…"

This number seems to be off by about a factor of 2X as I can't possibly conceive of why one would dewater more than 200 to 225 feet of creek to remove this structure.

Respectfully,

David W. Albrecht

David W. Albrecht
(408) 225-7600

Parks, Jeff@Waterboards

Subject: FW: CEQA P-606 / South Cow Creek Channel Nature in Wagoner Canyon

The following are combined emails from David Albrecht that I am submitting for the record. Portions of the emails not related to project comments have been omitted.

Jeffrey Parks

From: David Albrecht [private]
Sent: Monday, April 22, 2013 11:37 AM
To: Parks, Jeff@Waterboards
Subject: CEQA P-606 / South Cow Creek Channel Nature in Wagoner Canyon

Jeff,

1. If you want a reasonably good pictorial overview of the nature of South Cow Creek in Wagoner Canyon, that lets one gain understanding of the typical channel characteristics, please just go to Volume 3 of the LSA Appendix A. Reflect on the 10 pictures of the 9 barriers on pages A-5, A-6, & A-7. Do realize one is viewing the barriers {most constrained channel sections of the creek}; but the pictures also often show the channel above & below the barriers.

2. Barrier SC-9 shown on Page A-5 is the Project Diversion structure. Please compare this picture with the others for the Wagoner Canyon.

[private]

Dave

From: David Albrecht [private]
Sent: Sunday, April 21, 2013 11:07 AM
To: Parks, Jeff@Waterboards
Subject: P-606 CEQA D. Albrecht Comment / Ref. Heidi Strand Comments submitted on German Ditch

Jeff,

1. At 4/10 Scoping meeting someone from Beatty Associates {Bob R?} gave input with respect to the German Ditch. In addition, Heidi Strand has submitted a Comment package having a letter to FERC
dated January 20, 2012.

2. Ms. Strands information package was also again forwarded to FERC on 7/17/2012 {FERC# 20120808-0021}
and PG&E responded on 08/20/2012 [FERC # 20120820-5084}.

3. Other water users subject to the 1969 Adjudication were not completely in agreement with one part of that response
by PG&E. They in turn filed a comment letter with FERC in October 2012 {FERC #10121009-0009} with a copy to the SWRCB,

CDF&W, PG&E, and the SCCDA Secretary (Camie Weir).

4. In the CEQA, please make use of all of the above information in these FERC Filings when addressing and assessing
the impact of the License Surrender on the SCCDA (German Ditch) water users.

Dave Albrecht
[private]

From: David Albrecht [private]
To: Jeff Parks <jparks@waterboards.ca.gov>
Cc: carlos.meija@waterboards.ca.gov
Sent: Sat, April 20, 2013 6:28:02 PM
Subject: Fw: P-606 CEQA AA2

Jeff, Carlos;

1. On further reading of FERC wording for AA2, I can't say I am excited about the specific wording for the first two
setences in their 3rd paragraph. Again my thoughts on a possible revised text:

" The South Cow Creek diversion dam and canal intake would be modified as necessary to provide to the main canal
any availble flow; after CDF&W bypass requirements are satisfied, up to 13.13 cfs, which is the limit of ADU right during the irrigation season.
All flows in excess of that would be released to the South Cow Creek bypassed reach below the diversion dam.
The..... Hooten Gulch."

Dave

----- Forwarded Message ----
From: David Albrecht [private]
To: carlos.meija@waterboards.ca.gov
Cc: Jeff Parks <jparks@waterboards.ca.gov>
Sent: Sat, April 20, 2013 5:41:00 PM
Subject: P-606 CEQA AA2

Carlos,

1. The CEQA plans to use AA2. I urge you to review the detailed FERC wording of AA2 as now set forth
on pages 35 & 36 of their NEPA EIS.

2. FERC can plead some degree of ignorance with respect to fundamental principles concerning California
water rights and Court Adjudications - the SWRCB can not. The SWRCB must also maintain neutrality; as has the SWRCB in recent years reminded myself and other water users subject to the 1969 Decree.

3. If the SWRCB is going to use AA2, I strongly recommend there be a well thought out "**water rights qualifying paragraph**" after the now existing
3rd paragraph - possibly along the thought process reflected in the following text:

"Per the standing 1969 Cow Creek Decree, the only water diversion allowed at the SCC diversion in the South Cow Group
is a 3rd priority non consumable one for power generation. It is presumed under this Alternative that the necessary process would
be undertaken through the Superior Court of Shasta County to modify the Decree to permit the Abbott right in a manner that
did not promote nor harm their existing water right; or the those of others."

" Land right easements, access and maintenance agreements would need to be developed with private landowners..... penstock.

4. Above sentence is FERC fourth paragraph with 3 additional words at beginning.

[private]

Dave Albrecht
[private]

Comment 6

04462013 - 05 JP 4

JAMES WALLACE FLETTER
3939 Walnut Avenue, Unit 110
Carmichael, CA 95608

April 15, 2013

Attention: Mr. Jeffery Parks
State Water Resources Control Board
Division of Water Rights
P. O. Box 2000
Sacramento, CA 95812-2000

Ref: P-606-027CA, Kilarc-Cow Creek Hydroelectric Project Application for Surrender of License by Licensee Pacific Gas and Electric Company

Dear Mr. Parks

My name is James Wallace Fletter. I am the great grandson of A. F. Smith who was one of the developers of the Kilarc-Cow Creek Hydroelectric Projects in the 1904 – 1907 time frame. This letter and attachment only deal with the Cow Creek Development on the South Cow Creek watershed.

The attachment to this letter consists of a JUDGMENT AND DECREE QUIETING TITLE TO REAL PROPERTY, CONSISTING OF SIX PAGES WITH EXHIBITS A THROUGH E, FILED AND RECORDED ON OCTOBER 6, 1980 AND ENTERED INTO BOOK 155, PAGE 371 IN THE SHASTA COUNTY RECORDER'S OFFICE. THIS DOCUMENT SPEAKS FOR ITSELF ON WHAT PG&E CAN AND CANNOT DO ON OUR PROPERTY. THE LEGAL DESCRIPTION FOR OUR PROPERTY IS SHOWN IN EXHIBIT "A"

Exhibit B is the Cow Creek Forebay Easement. Note that there in nothing implicit in this easement that gives PG&E any right to fill in the forebay or otherwise destroy or take out this improvement on our property.

Exhibit C is the South Cow Creek Main Canal. This easement allows for the replace of the canal by a pipeline which pipeline can be removed. There is no provision for the removal of the existing open canal which is not a pipeline.

Exhibit D is the Kilarc - Redding 60 KV Pole Line and Communication Pole line. This easement

allows for the removal of pole line improvements on our property.

Exhibit E is the Project Access Road easement on our property. PG&E has no right to take any part of the access road on our property.

Neither Exhibits B, C, or E allow for the removal or destruction of improvements on our property. In additional, the exhibits do not allow for original construction and are non-exclusive.

The ownership of the improvements for the forebay, the canal, and the road easement are not held by PG&E. PG&E only has the right to use and maintain, and if necessary, to reconstruct these improvements, but cannot destroy or remove them, with the exception of the pole line.

Please take into consideration our **PROPERTY RIGHTS** as described above and in the attached **JUDGMENT AND DECREE QUIETING TITLE TO REAL PROPERTY** when preparing the draft and final Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender.

Sincerely,

James Wallace Fletter

James Wallace Fletter
Stakeholder

Telephone Number 916 482-5396
E-Mail jamesfletter@aol.com

ATTACHMENT CONSISTING OF FOURTEEN PAGES

CHARLES T. VAN DEUSEN
CHARLES W. THISSELL
ROBERT R. RICKETT
77 Beale Street, 31st Floor
San Francisco, CA 94106
415/781-4211

Attorneys for Plaintiff
PACIFIC GAS AND ELECTRIC COMPANY

Re: P-6016-027

Submitted during scoping meeting 10/22/2009

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SHASTA

PACIFIC GAS AND ELECTRIC COMPANY, Plaintiff, vs. ALBERT WILLIAM SMITH, individually, and as Executor of the Estate of Mary Schaw Smith; ANN ELIZABETH SOSKE, individually and as Executrix of the Estate of Mary Schaw Smith; JAMES T. WOODBURN, JR.; JAMES WALLACE FLETTER, individually and as Executor of the Estate of Sarah Elizabeth Fletter, Defendants. and all other persons unknown claiming any right, title, estate, lien or interest in the real property described in the complaint adverse to plaintiff's ownership, or any cloud upon plaintiff's title.	NO. 56761 JUDGMENT AND DECREE QUIETING TITLE TO REAL PROPERTY

The above entitled cause came on regularly for hearing before the above entitled Court sitting without a jury on the 25th day of January, 1979, ROBERT R. RICKETT, Esq., appeared as attorney for plaintiffs; JOHN E. FISCHER, Esq. of the Law Firm of DIEPENBROCK, WULFF, PLANT & HANNEGAN, appeared as attorney for defendants, ESTATE OF MARY S. DAY (named in the complaint as

1 Mary Schaw Smith) and ANN ELIZABETH SOSKE; GARY G. GAMEL, Esq.
2 appeared for defendant ALBERT WILLIAM SMITH; MARTIN BRIFMAN, Esq.,
3 of the Law Firm of COOPER, TAYLOR & SANDS, appeared as attorney
4 for defendant, JAMES W. FLETTER, both individually and as Execu-
5 tor of the Estate of Sarah Elizabeth Fletter, and there being no
6 appearance for or on behalf of any of the other defendants;
7 And it appearing and the Court finds that an Order for
8 Publication of Summons as to "all other persons unknown claiming
9 any right, title, estate, lien or interest in the real property
10 described in the Complaint adverse to plaintiffs' ownership or
11 any cloud upon plaintiffs' title thereto", was duly made by the
12 Court and filed herein on the 28th day of May, 1978.
13 And it further appearing and the Court finds that all of
14 the above named defendants and also all other persons unknown
15 claiming any right, title, estate, lien or interest in the real
16 property described in plaintiffs' complaint and hereinafter
17 described adverse to plaintiffs' ownership or any cloud upon
18 plaintiffs' title thereto have been duly and regularly served
19 with Summons and Complaint by personal service in this action or
20 by publication in accordance with the Order of this Court and
21 according to law; that a proper Affidavit of Publication of
22 Summons is on file herein, that the time allowed by law for the
23 appearance of any or all of said defendants, both known or
24 unknown, has expired.
25 That a Declaration Relative to Military Service for those
26 defendants who are known defendants of record other than those

1 representated by counsel at this hearing has been filed herein.
2 And it further appears and the Court finds that the Estate
3 of Sarah Elizabeth Pletter has disclaimed any interest in the
4 property that is the subject of this action.
5 And it further appearing and the Court finds that except
6 for the defendants appearing by counsel as set out above, the
7 default of each and all of the remaining defendants, both known
8 or unknown, is hereby entered.
9 And it further satisfactorily appearing to this Court and
10 the Court finds:
11 1. The complaint in this action was filed on the 7th day
12 of February, 1977; that the Summons in said action was issued on
13 the 7th day of February, 1977, and reissued on the 19th day of
14 April 1978; that thereafter full, true and correct copies of the
15 Summons in said action were on the 2nd day of May, 1978, and
16 within thirty (30) days after the reissuance of said Summons,
17 posted in conspicuous places on the real property described in
18 plaintiffs' Complaint.
19 2. That a Lis Pendens was duly and regularly executed,
20 filed and recorded in the Recorder's Office of the County of
21 Shasta, State of California, on the 11th day of February, 1977,
22 in Volume 1399 of Official Records, at page 402, Shasta County
23 Recorder's Office, Shasta County, California, as provided by law.
24 3. That a Declaration relative to Military service of
25 the defendant, JAMES T. WOODBURN, has been filed and none of the
26 defendants named in this action is in the military, naval or air

force of the United States or an officer of the Public Health detailed by proper authority for duty either with the Army, Navy or Air Force or in training or being educated under the supervision of the United States preliminary for induction into the military service.

NOW, THEREFORE, pursuant to stipulation entered into in open court by all parties appearing herein;

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

1. That the named defendants are the owners in fee simple of those certain undivided interests set forth below in, and entitled to the possession of, all that certain real property situate in the Unincorporated Area of the County of Shasta, State of California, referred to and described in "EXHIBIT A" attached hereto and made a part hereof by reference and as described in plaintiff's complaint on file herein, subject, however, to those certain easements and rights in plaintiff PACIFIC GAS AND ELECTRIC COMPANY described and set forth in "EXHIBITS B, C, D, and E" attached hereto and made a part hereof by reference. The undivided interests of said defendants are:

Albert William Smith	12-1/2%
Ann Elizabeth Soske	12-1/2%
James T. Woodburn, Jr.	8-3/4%
James T. Fletter	41-1/4%
Estate of Mary S. Day (Mary Schaw Smith)	25 %

2. That the claims of plaintiff PACIFIC GAS AND ELECTRIC COMPANY, a corporation, save and except as to those easements

and rights more particularly described in "EXHIBITS B, C, D and E" attached hereto and made a part hereof by reference; and also the defendants described in the complaint as "all other persons unknown claiming any right, title, estate, lien or interest in the real property described in the complaint adverse to plaintiff's ownership or any cloud upon plaintiff's title thereto," (unnamed defendants) and all who claim title under them or either of them in and to said real property or any part thereof are without any right whatever; and that said unnamed defendants and each of them or anyone claiming title under or through them or any of them have no right, title, interest, claim or estate whatever in any capacity, in, to or upon said real property or any part thereof; or any cloud of any nature, kind or character upon, in or to the title of the named defendants; in and to the real property hereinafter described.

3. That the aforesaid plaintiff and unnamed defendants, excepting as to the interests of plaintiff, PACIFIC GAS AND ELECTRIC COMPANY, described in "EXHIBITS B, C, D and E" attached hereto and made a part hereof by reference, and each of them and all persons claiming under them are hereby forever enjoined and debarred from claiming or asserting any estate, right, title, interest in or to any claim or lien upon the real property described in "EXHIBIT A" attached hereto and made a part hereof, or any part of said property.

4. That the property, title to which is hereby quieted, is all that certain real property situate in the Unincorporated

Area of the County of Shasta, State of California, and more particularly described in "EXHIBIT A" attached hereto and made a part hereof by reference as though fully set forth herein.

Done in open Court the 25th day of January, 1979, and signed OCT 6 1980, 1980.

R. W. ABBE

JUDGE OF THE SUPERIOR COURT

APPROVED AS TO CONTENT
AND FORM:

GARY E. GAMEL, Attorney for Defendant
Albert William Smith

JOHN E. FISCHER, Attorney for Defendant
Estate of Mary Schaw Smith (Mary S. Day)

MARTIN B. BRIFMAN, Attorney for Defendant
James T. Fletter, Jr.

ROBERT R. RICKETT, Attorney for Plaintiff
PACIFIC GAS AND ELECTRIC COMPANY

Diepenbrock, Wulff, Plant & Hannegan
Attorneys for Ann Elizabeth Soske

EXHIBIT "A"

LANDS

Situate in the County of Shasta, State of California.

(APN 099-140-15)

The south half of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M.

EXHIBIT "B"

COW CREEK FOREBAY

A non-exclusive easement and right of way to reconstruct, dredge, maintain and use a reservoir for the storage and release of water within the parcel of land described as follows:

Parcel 1. Beginning at a point in the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., and running thence along said westerly boundary line
(1) north 2° 10.7' east 500.36 feet;
thence leaving said westerly boundary line
(2) East 190.49 feet; thence
(3) South 500.00 feet; thence
(4) West 209.51 feet, more or less,
to the point of beginning; said point of beginning bears north 2° 10.7' east 625.00 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in rock mound accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 2.30 acres, more or less.

Together with the right from time to time to:

A. deposit and level onto said Parcel 1 such debris or other spoil material removed from said reservoir as plaintiff may reasonably deem necessary in the reconstruction, dredging, or other maintenance thereof;

B. raise or lower the water level within said reservoir as plaintiff may reasonably deem necessary for the proper maintenance and use thereof;

C. line the bed and banks of said reservoir with such porous materials as plaintiff may reasonably deem necessary for the proper maintenance and use of said reservoir;

D. use and store temporarily such equipment and materials within said Parcel 1 as plaintiff may reasonably deem necessary in connection with the reconstruction, maintenance and use of said reservoir, canal,

(EXHIBIT "B" Continues)

road or pole lines;

E. use such portions of said Parcel 1 to provide plaintiff with access from the Project Access Road described in EXHIBIT "E" hereof to the South Cow Creek Main Canal described in EXHIBIT "C" hereof, to the Kilarc-Redding 60 kv Pole Line and Communication Pole Line described in EXHIBIT "D" hereof, and to the southeast quarter of the southeast quarter of Section 31, Township 32 North, Range 1 West, M.D.B.& M., provided, that said access shall be by means of such route or routes as shall occasion the least practicable damage to said Parcel 1;

F. trim and to cut down and clear away any trees or brush, and to control vegetation by any and all reasonable means, including spraying, which may interfere with plaintiff's use of said reservoir;

G. prohibit the taking of any water from said reservoir, or the erection or construction of any building or other structure, or the construction of any reservoir or other obstruction within said Parcel 1, except that owner shall have the right to drill a well within said Parcel 1, provided that the location of any such well is approved by plaintiff, which approval shall not be unreasonably withheld, and such well does not cause a taking of water from said reservoir; and

H. mark the location of said Parcel 1 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 1.

(End of EXHIBIT "B")

EXHIBIT "C"

SOUTH COW CREEK

MAIN CANAL

A non-exclusive easement and right of way to reconstruct, maintain and use a canal for the purpose of conveying water within the parcel of land described as follows:

Parcel 2. A strip of land of the uniform width of 75 feet extending from the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., northeasterly to the northerly boundary line of the south half of the southwest quarter of said Section 32 and lying 50 feet on the northwesterly side and 25 feet on the southeasterly side of the line which begins at a point in said westerly boundary line and runs thence north 55° 07.3' east approximately 390 feet to a point in said northerly boundary line; the point of beginning of this description bears north 2° 10.7' east 1177.32 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in rock mound accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 0.61 acre, more or less.

Together with the right from time to time and at any time to:

A. use such portions of the Lands described in EXHIBIT "A" hereof to provide plaintiff with access from the Project Access Road described in EXHIBIT "E" hereof to said Parcel 2, provided, that said access shall be by foot only and shall follow such route or routes as shall occasion the least practicable damage to said Lands;

B. line said canal with such porous materials as plaintiff may reasonably deem necessary for the proper maintenance and use of said canal and to prevent undue seepage therefrom;

C. excavate for, construct, install, repair, replace, remove and use a buried pipe or culvert in lieu of said canal as plaintiff may reasonably deem necessary for the purpose of conveying water within said Parcel 2;

D. deposit onto said Parcel 2 on the northwesterly side of said canal

(EXHIBIT "C" Continues)

such debris or other spoil material removed from said canal as plaintiff may reasonably deem necessary in the reconstruction or maintenance thereof, or in the construction or maintenance of said pipe or culvert;

E. use and store temporarily such equipment and materials within said Parcel 2 as plaintiff may deem necessary for use in connection with the reconstruction, maintenance and use of said canal, or the construction, maintenance and use of said pipe or culvert;

F. trim and to cut down and clear away any trees or brush and to control vegetation by any and all reasonable means, including spraying, which may interfere with plaintiff's use of said canal, pipe or culvert;

G. prohibit the taking of any water from said canal, pipe or culvert, or the erection or construction of any building or other structure, or the construction of any reservoir or other obstruction within said Parcel 2, except that owner shall have the right to drill a well within said Parcel 2, provided that the location of any such well is approved by plaintiff, which approval shall not be unreasonably withheld, and such well does not cause a taking of water from said canal; and

H. mark the location of said Parcel 2 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 2.

(End of EXHIBIT "C")

EXHIBIT "D"

KILARC - REDDING 60 KV POLE LINE

AND COMMUNICATION POLE LINE

A non-exclusive easement and right of way to reconstruct, replace, remove, maintain and use the existing line of poles with the present number and size of wires as are now suspended therefrom for the transmission and distribution of electric energy, and for communication purposes, and all necessary and proper crossarms, guys, anchors and other appliances and fixtures for use in connection with said poles and wires, within the parcels of land described as follows:

> Parcel 3. A strip of land of the uniform width of 50 feet extending from the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., northeasterly to the northerly boundary line of the south half of the southwest quarter of said Section 32 and lying 25 feet on each side of the line which begins at a point in said westerly boundary line and runs thence north 44° 35.7' east 261.63 feet to a point herein for convenience called Point "A"; thence continues north 44° 35.7' east approximately 750 feet to a point in said northerly boundary line; the point of beginning of the description bears north 2° 10.7' east 669.14 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in a rock mound, accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 1.16 acres, more or less.
>
> Parcel 4. A strip of land of the uniform width of 20 feet extending from the northwesterly boundary line of the strip of land hereinbefore described and designated Parcel 3 northwesterly to the westerly boundary line of the southwest quarter of said Section 32 and lying 10 feet on each side of the line which begins at a point in said northwesterly boundary line and runs thence north 43° 19.7' west approximately 220 feet to a point in said westerly boundary line; the point of beginning of this description bears north 43° 19.7' west 25.00 feet distant from said Point "A"; being a portion of said Section 32 and containing 0.10 acre, more or less.

Together with the right from time to time and at any time to:

A. use such portions of the Lands described in EXHIBIT "A" hereof to provide plaintiff with access from the Project Access Road described

(EXHIBIT "D" Continues)

in EXHIBIT "E" hereof to said Parcel 3 and said Parcel 4, provided, that said access shall occasion the least practicable damage to said Lands;

B. install, replace, maintain and use anchors with appurtenant guy wires, which will extend outside of said Parcel 3, at such locations as plaintiff may reasonably deem necessary for use in connection with the pole line facilities;

C. trim and to cut down and clear away any and all trees and brush now or hereafter on said Parcel 3 and said Parcel 4 and the further right from time to time to trim and to cut down and clear away any trees on either side of said Parcel 3 and said Parcel 4 which in the opinion of plaintiff may be a hazard to said pole line facilities by reason of the danger of falling thereon;

D. prohibit the erection or construction of any building or other structure, or the drilling or operation of any well, or the construction of any reservoir or other obstruction within said Parcel 3 and said Parcel 4;

E. install, maintain and use gates in all fences which now cross or shall hereafter cross said Parcel 3 and said Parcel 4; and

F. mark the locations of said Parcel 3 and said Parcel 4 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 3 and said Parcel 4.

(End of EXHIBIT "D")

EXHIBIT "E"

PROJECT ACCESS ROAD

The right to reconstruct, maintain and use a road within the parcel of land described as follows:

Parcel 5. A strip of land of the uniform width of 20 feet extending from the easterly boundary line of the parcel of land hereinbefore described and designated Parcel 1 under EXHIBIT "B" in a general northeasterly direction to the northerly boundary line of the south half of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., and lying 10 feet on each side of the line which begins at a point in said easterly boundary line and runs thence

(1) north 44° 40.2' east 188.39 feet; thence
(2) north 88° 19.8' east 66.63 feet; thence
(3) north 36° 45.6' east approximately 197 feet

to a point in said northerly boundary line; the point of beginning of this description bears South 27.64 feet distant from the northeast corner of said parcel of land designated Parcel 1; being a portion of said Section 32 and containing 0.21 acre, more or less.

Together with the right from time to time and at any time to grade said Parcel 5 for the full width thereof and to extend the cuts and fills for such grading into and on the Lands described in EXHIBIT "A" hereof to such extent as may be reasonably necessary.

Said road is for ingress to and egress from the Cow Creek Forebay described in EXHIBIT "B" hereof, the South Cow Creek Main Canal described in EXHIBIT "C" hereof, the Kilarc - Redding 60 kv Pole Line and the Communication Pole Line described in EXHIBIT "D" hereof, and the southeast quarter of the southeast quarter of Section 31, Township 32 North, Range 1 West, M.D.B.& M.

Parks, Jeff@Waterboards

Subject: FW: Save Kilarc lake : Jim hamilton in Redding ,ca - P-606 Water Quality Certification Scoping Comment

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Monday, April 22, 2013 9:53 AM
To: Jim Hamilton; Parks, Jeff@Waterboards
Cc: [private]
Subject: Save Kilarc lake : Jim hamilton in Redding ,ca - P-606 Water Quality Certification Scoping Comment

Jeff - Dick Ely and I met Jim Hamilton while he was fishing at Kilarc the day before your scoping meeting, just before your team arrived and we chatted with you in the parking lot, so you may have seen him as well (north side of the reservoir, just east of the hydroelectric intake). I gave him my card and told him that I would forward to you any comment he wrote as input to your environmental impact analysis.

I'm pleased that Jim has met your deadline of noon today for submission of the below comments.
Kelly

-------- Original Message --------
Subject: Save Kilarc lake : Jim hamilton in Redding ,ca
Date: Mon, 22 Apr 2013 09:02:44 -0700 (PDT)
From: Jim Hamilton [private]
Reply-To: Jim Hamilton [private]
To: KellyS@kchydro.com <KellyS@kchydro.com>

I am writing you to let you know how of an important of a lake Kilarc lake is to me.I moved to Redding From Marin county in 2004 for the fishing and the fly fishing .One of my new Neighbors told me about Kilarc lake. And that it had the best fishing in the Redding area and he thought that there was a state record trout caught there. So I look it up and started fishing there .I found that I could catch fish there regularly on a fly rod, and the fish were quality the lake is very healthy. Kilarc lake also has great access .I can take one of my uncles who are in there eighty's .they do not have to worry about tripping on rocks in streams or on trails. They can have a good Day fly fishing. Kilarc Lake is kind of a cross between Grace Lake and Hat creek.Kilarc has great fly fishing and good populations of fish, clean and its beautiful .with view of trinity alp's that are kind of rare and of mount lessen too. Fishing and fly fishing at Kilarc Lake for older people, handicapped and people in wheel chairs, kids and families ,and the fish are vary catchable. I think Kilarc could be improved if there were cameras out there to make it safer for old people and females and Graces Lake too. Thanks

To: Mr. Jeffrey Parks

State Water Resources Control Board

Division of Water Rights

P.O. Box 2000

Sacramento, CA 95812-2000

Regarding: Comment Letter – Kilarc-Cow NOP

Dear Mr. Parks –

Thank you for the opportunity to give input to the scoping and EIR process undertaken by your agency for the Kilarc-Cow PG&E hydroelectric projects. I am a resident of the South Cow Creek valley, where my household maintains a riparian water right from South Cow Creek for our domestic use, and we hold an adjudicated water right from South Cow Creek for our agricultural irrigation use. We chose this location as our home with specific reliance on the availability of these water resources, and appreciate your agency's mandate to ensure the fair and beneficial uses of these water resources for all involved.

Specific Water Quality Concerns –

First I would like to quickly address my concerns for my riparian/domestic water use. The quality of the water in South Cow Creek is critical to my household and my neighbors who rely on the water from the creek for our domestic use. Any possible detriment to the quality of that water would directly impact us through our consumption of that water. Though we take necessary measures to filter and treat our domestic water, the materials currently impounded behind the South Cow Creek diversion structure have been in place for over 100 years, and therefore have built up over decades of various conditions throughout the upper watershed, including mining activities that were either unregulated, or regulated to a lesser degree, as to the chemicals used and allowed runoff into the stream system.

While the true presence and extent of possibly noxious materials impounded behind the dam is unknown, all possible measures should be taken to ensure that thorough testing of the impounded materials is done, and continuous and vigilant monitoring of the water quality, if the dam should be removed, must be performed to ensure that no degradation of the water quality in South Cow Creek occurs, or if it occurs that 1) we are notified immediately so that we may protect ourselves from its effects, and 2) the condition is corrected as immediately as possible.

Multiple core samples of the impounded materials from various location behind the dam should be taken and analyzed so that no significant pocket of undetected noxious material might be released. If the dam is removed, continuous monitoring at various locations downstream of the impounded material should be undertaken and those results compared to water quality from above the impounded material's location – at least until the impounded materials have been released from the channel of the stream and made their way throughout the natural watercourse.

I realize this is a significant amount of effort, however, this is a primary concern not just to those of us who drink the water, but to your agency as this is its directive and purpose. Clean drinking water is what this is about. This is an issue which goes directly to the health and welfare of my family and my neighbors and deserves serious consideration and action – addressing this possibility after it might happen would be an enormous disservice to us who rely on your agency to ensure our safe use of our water resources.

Proposed Decommissioning Plan, Alternatives and No Action –

There is an imminent and over-riding issue concerning the proposed decommissioning plan and many of the alternatives examined to date. That issue is the adjudication covering water rights in the Cow Creek drainage. The Cow Creek Adjudication Decree of the Superior Court of California for Shasta County, California In the Matter of the Determination of 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 – No. 38577 – Decree Entered August 25, 1969, in Book 89 of Judgments, page 484 – attached and hereinafter 'The Adjudication' – has managed and maintained the various water rights throughout this watershed since its creation. It is very specific in its description and definition of the water supplies and uses, and was well informed by your agency through the Cow Creek Adjudication Report on Water Supply and Use of Water on Cow Creek Stream System Shasta County, California of May 1965 – attached and hereinafter 'the Water Supply Report.'

Both of these documents relate the interconnected nature of PG&E's South Cow Creek facility with the water supply available to other members of the Adjudication. The Adjudication is not ambiguous in its dictum that no member of the Adjudication is allowed to take any action, direct or indirect, that will obstruct or interfere with the rights of the other parties to the Adjudication (the Adjudication at para. 30, pg. 190.)

PG&E's proposed decommissioning plan and the FERC (and your) Alternative 1 both openly contemplate the removal of the PG&E diversion structure on South Cow Creek. That removal would directly impact the adjudicated diversion number 73 at the base of Hooten Gulch – also known as the Abbott Ditch diversion (see Superior Court Judge Halpin's decision of January 31, 2012 attached). It is well documented in the Water Supply Report that the water available at diversion 73 consists primarily of the tailrace water from the South Cow Creek powerhouse as well as a small amount of irrigation runoff (The Water Supply Report, Table A-4 Description of Diversion Systems – pgs. A-95 and A-96.) Your agency's Water Supply Report, and therefore the Adjudication as well, foresaw and contemplated these (still current) water supply conditions and they are part and parcel of the Adjudication. Therefore they are subject to the effect of the decree, which bars any party from interfering with the rights of any other party to the Adjudication.

This being the case, both PG&E's proposed decommissioning plan, and the Alternative 1 from FERC and your scope should be removed from consideration. Instead, alternatives must be developed which respect the effect of the decree as a first condition, and then work towards the stated goal of releasing PG&E from their license to generate hydropower with these facilities. To waste time, money and resources investigating proposals that are on their face insufficient and contrary to the stated law in the decree only exacerbates an already complicated situation.

In addition, any 'No Action' alternative that may be developed should also ensure that the current decreed water supply remains in place – while I do not eliminate the possibility that the water right at diversion 73 might be made whole through a means other than the current delivery method, that situation, or the assumption of that situation, obviously would not meet the requirements of a 'No Action' alternative. An accurate and feasible 'No Action' alternative must be developed, first and foremost, so that the remaining alternatives can be realistically measured against that baseline condition – without a proper measure by which we can judge and compare decommissioning plans and alternatives, your process quickly devolves, albeit unintentionally, into relativistic arguments among the many agencies, NGOs and private parties involved in this process. We have all been through that already with the FERC.

Many alternative proposals were forwarded throughout the FERC process (see the attached synopsis of FERC filings provided by the Tetrick Ranch and the FERC filings to which it refers, as well as the entire FERC record), and in private negotiations. Due to what can only be categorized as the agencies' pre-decisional adherence to the original proposed destruction of the South Cow Creek diversion they were all rejected immediately without any assessment what so ever. Agencies openly claimed that they would never allow any such alternative to come into being without so much as studying whether or not their assumptions (or the claims of the alternatives for that matter) were valid. They threatened obstruction through their state mandated conditioning authority over any new project that might seek to use the water resources currently producing hydropower. If this isn't pre-decisional activity, I'm not sure what is. Even despite the obvious legal ramifications of their proposed action the agencies and PG&E steadfastly refused to consider any alternative other than the proposed decommissioning plan.

Given the agencies' arbitrary intransigence the public offered an array of alternatives, each giving up more and more public benefit while trying to maintain at least the bare minimum of respect for legally mandated public use of the resources – the latest of which is attached as the Tetrick Ranch Technical Solution. All have been rejected immediately by the agencies. It is time to start anew with the proper respect due these publicly proposed alternatives.

We participated, with Shasta County, Evergreen Shasta Power, Tetrick Ranch and Sierra Pacific Industries, in a coalition that provided an alternative that was ignored by the FERC (see the FERC synopsis referred to above), and pre-decisionally rejected by the agency's with threats of obstruction through their conditioning authority over the use of water resources. However, nothing bars the SWRCB from taking that proposal up, and requiring legitimate analysis of the claims from both sides of the issues in order to arrive at a valid assessment of such a plan. The agencies must come into the open, and participate in the process before the board, in order for their claims (and the public's) to be legitimately and fairly assessed.

I would encourage the SWRCB to take a fresh look at each alternative, and to indulge in the creation of alternatives that might combine various elements of previously offered alternatives and solutions. Only alternatives that are feasible should merit the work of analysis and serious consideration – feasibility is key, and a true, lasting solution to the decommissioning must be feasible in the short and long term – that is to say, that all considerations, including any short term and ongoing costs, must be accurately estimated and assigned in an equitable manner.

Effects on Adjudicated Diversion 73 and Project Scope –

During the FERC's process a serious flaw in scope emerged. While the agency considered the decommissioning plan and alternatives that left diversion 73 without a water supply, that agency failed to consider the follow on effects that action would have. Diversion 73 irrigates 400+ acres of land through the summer months, which makes the year round operation of ranching possible on the larger ranches which surround their irrigated sections. By removing irrigation on these smaller sub-sections of these ranches, you effectively eliminate the possibility of maintaining year round ranching operations, and introduce enormous expenditures in finding and leasing other irrigated land in order to maintain any operations. This effect cannot be ignored or underestimated. The increased expenditure would result in the cessation of ranching, and therefore the livelihood, of most of the ranches served by diversion 73.

While the impacts to agriculture and ranching are egregious, they are not the worst effect. Diversion 73 also directly serves the domestic water supply to several households in the South Cow Creek valley. While the FERC chose to 'assume' a well or other replacement supply, they were mistaken about the feasibility of that assumption. Serious study of the hydrology of the South Cow Creek valley shows that the Chico formation that lies just under the valley floor traps the percolated runoff from irrigation and allows for some of that water to be re-pumped to the surface for either domestic or secondary irrigation use. This is accomplished via shallow wells. Without the original supply from diversion 73, this would not be possible. In addition, wells that have been drilled through the Chico formation have encountered saltwater, among other elements, which renders replacement of domestic water supply infeasible.

The scope of the SWRCB examination of this decommissioning process needs to include these easily foreseeable effects, and give them appropriate weight – these are not mere inconveniences to our lifestyle and livelihood - they are more than significant impacts – these effects would destroy the lifestyle and livelihood of many residents here in the valley, deteriorate the lifestyle and livelihood of those that remain, drastically reduce the value of the land in the valley, and have follow-on effects in the larger community's tax base, etc. While the FERC chose to minimize and ignore these effects, they arbitrarily and glibly praised and over-weighted tenuous 'benefits' from obliterating the water supply to this valley. They committed a serious disservice to the residents of this valley by engaging in the relativistic arguments I mentioned earlier, and fomenting only one perspective. The FERC ignored the very environmental impacts they were tasked with identifying and assessing. Your agency is afforded an opportunity to rectify that disservice and deal fairly and equitably with all sides of this issue.

Environmental Effects of Discontinued Water Service to Adjudicated Diversion 73

While most agencies involved have quickly *assumed* environmental benefits from the decommissioning plan, no agency to date has assessed the environmental impact to the entire ecosystem in the South Cow Creek valley and Hooten Gulch. The robust riparian habitat here is maintained in Hooten Gulch by the natural flow of the hydroelectric tailrace water, while the habitat throughout the rest of the South Cow Creek valley is maintained by runoff from the irrigation practices served from diversion point 73. The removal of this critical supply during the summer months would obviously disturb that balance that has been in place for well over 100 years. The protection of these habitats is well within, indeed the target of, our state's water regulating laws.

While some agencies might still claim that the destruction of the current ecosystem is fine, it cannot be overlooked as an impact of the decommissioning plan; the probable requirement to at least mitigate for this disaster must be measured where possible and estimated where measurement is not possible. It must be assessed and given equal standing and weight in measuring the overall impact of this plan. In an era when irrigators who wish to repair water wasting leakage in their ditches and flumes are denied that ability because the trickling waters have created 'wetland', I find it grotesquely capricious and arbitrary that agencies would ignore the drying up of Hooten Gulch, of hundreds of acres of pasture and hundreds of acres of riparian habitat. Fairness and equity demand that these obvious impacts be dealt with consistently. Mitigation laws were not created so that government agencies can use them capriciously against anyone who disagrees with their assumptions – they were created to protect the rights to, and beneficial uses of, our state's limited resources by the people, and to discourage or correct the damages inflicted by actions such as those proposed by PG&E.

PG&E's Abandonment Problem –

PG&E has modified their original intention to change the nature of their non-consumptive, power generation only, water right to one for in stream use only. This clearly would have required redress and modification of the Adjudication. They now state that they intend to abandon their water right and thereby achieve the same goal. However, the core issue is still at hand: modification of the natural flow of the South Cow Creek watercourse is not to be taken lightly or without consequences.

PG&E's tailrace waters are returned to Hooten Gulch, not directly into the flow of South Cow Creek's main channel. Hooten Gulch is a tributary to South Cow Creek in the same watershed. PG&E's tailrace water is therefore clearly natural flow. In addition, the Adjudication clearly defines natural flow:

> 5. Natural Flow
>
> The term "natural flow" means such flow as will occur at any point in a stream from the runoff of the watershed which it drains, from springs and seepage which naturally contribute to the stream, and from waste and return flow from dams, conduits, and irrigated lands, as distinguished from water released directly from storage for rediversion and use, or water imported from another watershed which is released directly to the natural channel for conveyance to place of beneficial use (the Adjudication, pgs. 3-4, Definitions-Natural Flow.)

Outside of the Adjudication it is also well settled in California water law that a watercourse, though initially made artificially, or initially increasing an existing tributary watercourse as in this case, may by long continued use become a natural watercourse and that others have all the rights to the waters therein as they would in a natural watercourse (see *Chowchilla Farms v. Martin*, 219 Calif. 1, 18, 25 Pac. (2d) 435 (1933) and *Smith v. Los Angeles*, 66 Calif. App. (2d) 562, 579 153 Pac. (2d) 69 (1944) as referenced in The California Law of Water Rights, Wells A. Hutchins (1956) with Harvey O. Banks, State Engineer of California, and in cooperation with the United States Department of Agriculture – loc. Watercourses – Watercourse Originally Made Artificially, pg. 32) .

Clearly, the watercourse in Hooten Gulch as it stands today is a natural watercourse, and must be treated as such when assessing the foreseen impacts of this public agency's decommissioning plan. The impacts to the natural flow of the South Cow Creek watercourse contemplated in PG&E's

decommissioning plan must not be obfuscated by their contrivance to simply 'abandon' their water right.

Abandonment of an appropriative right requires intent and action on the part of the water right holder. Because PG&E holds a non-consumptive water right for hydroelectric production only, it might be construed that PG&E can abandon their water right simply by intentionally ceasing to produce hydroelectricity with that water right – however, the follow on action of destroying their diversion which maintains the natural flow in Hooten Gulch must be dealt with separately, and be made subject to the overriding laws of the state and the Adjudication.

The MOU and Agency Positions –

The March 22, 2005 MOU signed by your agency, among other agencies and non-government agencies, has many issues. Attachment A to the MOU lists subject areas and desired conditions for the decommissioning of this project. Among Attachment A's desired conditions are listed:

3. Disposition of Canals and Spillways (includes waterways, tunnels and flumes)

    b) Preservation of riparian habitat during/after deconstruction wherever possible

7. Disposition of Water Rights

    b) Other water right holders (sic) rights are preserved

    c) All water rights are preserved subject to the law

    d) Water rights are enforceable and permanent

17. Deconstruction Activities

    a) Current water right holders continue to receive their water

In addition, the body of the MOU itself makes the following statements:

3. Decommissioning

    3.2 If FERC authorizes or orders the Company (PG&E) to decommission the Project, upon a final order from FERC ending Project power operations, the Company intends to transfer its appropriative water rights held for operations of the Project ("water rights") to a resource agency or other entity that: 1) agrees to use the water rights to protect, preserve, and/or enhance aquatic resources, as authorized by applicable laws and regulations, such as water code section 1707; and 2) is acceptable to the Parties. Additionally, prior to transferring of its water rights, the Company will work in good faith with other non-Parties to resolve potential water rights issues with the goal of having the water rights used to preserve, protect and/or enhance aquatic resources.

    3.6 If the Company files, or is ordered by FERC to file a surrender application and a decommissioning plan, the Parties will work collaboratively to develop the surrender schedule and decommissioning plan. The decommissioning plan will identify and refine

> the actions necessary to address the subjects and desired conditions in Attachment A following decommissioning of the Project and will be consistent with legal requirements and obligations to FERC, and other applicable state and federal laws. Decisions on actions to address the subjects and desired conditions in Attachment A will be made by consensus of all Parties involved in the decommissioning plan's development.

As stated above, when conflicts were identified between paragraph 3.2 and the Adjudication (i.e., the non-consumptive nature of PG&E's water right vs the ability to transfer and or designate another use for those water rights) PG&E changed their intended disposition of those water rights and claimed a desire to abandon those rights. Please refer to my discussion of the issues with abandonment of the water rights above. However, it should be noted that to date, PG&E has not worked in good faith to address the water rights concerns I have outlined above. PG&E has instead consistently denied the existence of any impacted water right. In addition, when I petitioned the Superior Court in Shasta County to address a clerical error that misidentified the exact location of diversion 73, PG&E fought that correction in court and claimed that it was motivated by a desire to gain an advantage in the proceedings before us now (see again, Superior Court Judge Halpin's decision of January 31, 2012 attached.) This clerical description of the location did nothing to effect the actual physical location of diversion 73, which had been (and continues to be) visited by dozens of PG&E representatives when assessing the project facilities. Clearly, this is not working in good faith with impacted water rights holders. Instead it demonstrates a need for vigilance and close scrutiny of PG&E's statements and actions, and a review of whether or not the MOU agreement is being adhered to by that company. It also demonstrates a lack of consensus building (as claimed in MOU para. 3.6 above) among the Parties, as until now, there is no public record of PG&E consulting with the other parties to the MOU before taking this aggressive tack.

When the FERC did issue an order for PG&E to submit their license surrender application and develop a decommissioning plan (as foreseen in paragraph 3.6) the public was allowed to raise their concerns and bring them to PG&E's and the agencies' attention. However, again, PG&E ignored them and did not bother to refine or address the impacted desired conditions in the MOU. PG&E's repeated denial of any impacted water right is a legally disagreeable position, and has been pointed out as such to PG&E by me personally as well as through legal representation. Applicable state law and the Adjudication itself has been repeatedly pointed out to PG&E as evidence that some negotiation or redress is needed. Again, to date, no public evidence has been shown that they have taken this issue up with the parties to the MOU; and indeed your agency would surely be aware of any such efforts as one of the parties to the MOU and the chief agency concerned with water rights. In their absence, again, I can only urge the SWRCB to closely scrutinize PG&E's statements and actions in light of what was agreed in the MOU and determine that the terms of the MOU cannot be considered upheld in this process. Instead, the SWRCB must take up the charge of carefully and meticulously determining when and where they perceive possible conflicts of the decommissioning plan with state water law and the court's decree (the Adjudication) and take appropriate action to enforce and protect those laws.

The agencies that directly advocate for the decommissioning plan as it stands in its draft form (and the FERC through its refusal to address any public concerns in its draft and final EIS) have repeatedly ignored public concerns over water rights, fire suppression, disabled access to recreation (including citation of the ADA act) and environmental impacts. No plan or offer has been forwarded by any agency nor by PG&E to address any of the public's concerns. Many varying excuses have been given: 'trust us, we'll do something later', or 'it's not my agency's problem,' or 'it's not the proper time in the process to address

that, you will have to wait until the problem has occurred.' None of these responses is in keeping with the spirit of the MOU, nor for that matter with the spirit of the laws under which these public input processes are required. The public is running out of opportunities to have their concerns addressed and will be left with only legal challenges to the entire process. None of the prospective outcomes of legal action after this proposed decommissioning might receive approval are better than addressing these hard issues now, in the process where they are intended to be addressed.

General Process Comments

While I appreciate the large amount of time, effort and money that have gone into this decommissioning process thus far, it needs to be drastically re-done. Instead of starting with foregone conclusions and assumptions about the final state of the project, all parties must come to the table and lay out their concerns and issues. The major sticking points, legal and otherwise, should be addressed first. If this is done, the rest of the pieces of the decommissioning can and will fall into place. I do not believe that it is impossible for PG&E to decommission this project, and I do support PG&E's desire to be relieved of the project.

I also feel that the reason why all of the public's input has been ignored thus far is because this process began with foregone assumptions about how the project would be decommissioned and the final state of the resources was 'pre-ordained' by PG&E and other agencies. This 'cart before the horse' approach must be undone if the public's input is going to be addressed as is required by the laws that govern this process, in a fair and equitable way. Blind adherence to the original proposed decommissioning plan in the face of obvious and significant legal issues can only be seen as evidence of pre-decisional activity by the agencies and PG&E. Both the FERC process and your agency's CEQA process specifically bar such pre-decisional activity and it must be rooted out for these processes to accomplish their public benefit goals.

Once the major issues – legal, public safety, public use, public recreation and environmental – are properly dealt with up front, the job of balancing the various special interest demands will be easier, and bound by a healthy process that treats the major public concerns with the respect they deserve. I believe that the balancing of the various trade-offs required to clear the path for PG&E's desired outcome is the major accomplishment that your agency can reach through a fair and equitable process, including if necessary, mandatory settlement negotiations with deadlines, reliant on solid findings of fact that provide relief for the public's valid and meaningful concerns.

Thank you for the opportunity to submit these comments, and I look forward to participation in the rest of your agency's process towards a fair outcome for all concerned.

Respectfully submitted,

April 22, 2013

Erik Poole

Attachment A

Project 606 FERC filings by Tetrick Ranch, Shasta County, the Abbott Ditch Users, Evergreen Shasta, and Erik Poole.

Title	**Date**	**eLibrary Accession Number**
Comments on Final Environmental Impact Statement of Tetrick Ranch under P-606.	10/14/11	20111014-5044
FOIA Responses from NMFS and U.S. Fish & Wildlife Service submitted by Tetrick Ranch and Evergreen Shasta Power, LLC under P-606-027.	11/16/10	20101116-5054
Motion to Correct Erroneous Statements in PG&E "Answer" and Statement of Corrections and Request for Waiver, if Necessary; or in the Alternative, Motion of Tetrick Ranch and Evergreen Shasta Power, LLC to Reject PG&E's "Answer" under P-606-027.	10/12/10	20101012-5319
Comments on DEIS of Erik Poole / ADU under P-606.	8/25/10	20100825-5065
Motion to Intervene of Evergreen Shasta Power, LLC under P-606.	8/25/10	20100825-5089
Comments of Tetrick Ranch and Evergreen Shasta Power, LLC, on Draft Environmental Impact Statement for the Kilarc-Cow Creek Hydroelectric Project License Surrender and Proposed Decommissioning under P-606.	8/25/10	20100825-5114
Shasta County submits request to reschedule the public meeting until mid-August re: the DEIS Kilarc-Cow Creek Project under P-606.	7/6/10	20100706-0023
Shasta County Board of Supervisors' notice of public hearing under P-606.	7/6/10	20100708-0022
Comment of County of Shasta (CA) under P-606.	6/30/10	20100630-5086
Response of Tetrick Ranch under P-606.	6/24/10	20100624-5128
Reply Comments of Evergreen Shasta Power, LLC, Tetrick Ranch, Abbott Ditch Users, Shasta County, and Sierra Pacific Industries, Inc. under P-606.	2/22/10	20100222-5104
Motion to Intervene Out-of-Time of Evergreen Shasta Power, LLC under P-606.	1/22/10	20100122-5121

Title	Date	eLibrary Accession Number
Motion Requesting Settlement Process and for Prompt Action under P-606.	1/22/10	20100122-5124
Offer of Settlement of Tetrick Ranch, the Abbott Ditch Users, Shasta County, Sierra Pacific Industries, Inc., and Evergreen Shasta Power, LLC under P-606.	1/22/10	20100122-5126
Comments of Erik Poole re: Kilarc- Cow Creek License Surrender Proceedings under P-606.	1/19/10	20100119-0033
Follow-Up Comments of Erik Poole to 20091230-5001 under P-606. Letter dated: 1/8/2010.	1/14/10	20100114-5007
Response of Erik Poole under P-606.	12/30/09	20091230-5100
Response of Tetrick Ranch to Comments of California Department of Fish and Game under P-606.	12/30/09	20091230-5103
County of Shasta submits response to the Request for Information from Robert H. Grieve, of the Commission 's Division of Hydropower Administration and Compliance dated 12/16/09 re: Kilarc-Cow Creek Hydroelectric Project under P-606.	12/24/09	20100104-0103
Response to Data Request of Shasta County, California under P-606.	12/16/09	20091216-5110
Comments of Evergreen Shasta Power, LLC re: Kilarc & Cow Creek under P-606.	11/16/09	20091116-0231
Comments of an Individual re: Kilarc- Cow Creek Hydroelectric Project under P-606.	11/16/09	20091116-0237
Comment of Tetrick Ranch, et al. under P-606.	10/30/09	20091030-5063
Comment of Shasta County under P-606.	10/19/09	20091019-5093
Scoping Comments and Information submission of Tetrick Ranch and the Abbott Ditch Users re: Pacific Gas and Electric Co under P-606.	10/16/09	20091016-5088
Answer and Supplemental Comments of Tetrick Ranch and Abbott Ditch Users, etc. under P-606.	8/25/09	20090825-5082

Title	Date	eLibrary Accession Number
Comment of Tetrick Ranch, et al. under P-606.	7/14/09	20090714-5093
Motion to Intervene of Tetrick Ranch under P-606	7/13/09	20090713-5165
Tetrick Ranch requests a meeting with FERC in connection with Pacific Gas and Electric Company's Kilarc-Cow Project under P-606.	6/15/09	20090619-0071
Comments of Steve & Bonnie Tetrick re: Pacific Gas and Electric Company's Kilarc-Cow Creek Project under P-606.	6/12/09	20090612-5142
Comments on P-606 PG&E DLSA submitted by Erik Poole on behalf of the Abbott Ditch Water Users (ADU) under P-606.	11/7/08	20081107-5043
Comments of Mr. and Mrs. Steven Tetrick, owners of the Tetrick Ranch, regarding Pacific Gas and Electric's South Cow Creek power house under P-606.	9/25/07	20071016-0041
Erik Poole requests that he be added to the mailing list for information re: filings and submissions for Pacific Gas and Electric Company's Kilarc-Cow Creek Hydroelectric Project under P-606.	5/29/07	20070601-0026
Comments of Shasta County Department of Resource Management concerning the First Stage Consultation Package dated June, 2002 re: Kilarc-Cow Creek Hydroelectric Project Relicensing under P-606.	7/23/02	20020812-1261
Shasta County submits change of address to update the official mailing list re: Pacific Gas & Electric Co., et al. under P-2667, et al.	5/9/02	20020514-0157

SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF SHASTA

Hon. Jack Halpin

Dept. 12/ct

#38577

IN RE COW CREEK WATER RIGHTS

NATURE OF PROCEEDINGS:

RULING ON MOTION TO AMEND OR MODIFY COW CREEK ADJUDICATION DECREE, SCHEDULE 2:

Erik Poole moves the Court for an order modifying the legal description of a point of diversion ("POD") set forth in the August 25, 1969 Decree determining rights of various claimants to the water of Cow Creek in Shasta County. Poole, a successor in interest to a portion of the POD, contends that the legal description of the Abbott Ditch POD as set forth in "Schedule 2" attached to the Decree, is erroneous. Specifically, Poole claims that the bearing and distance from the reference corner identified in "Schedule 2" incorrectly places the Abbott Ditch POD on a hillside away from any water source, and does not comport with the Decree's language used to describe the POD. The correct location, according to Poole, is actually located at the head of Abbott Ditch, where it intersects with Hooten Gulch. Poole claims this is the actual and current location of the POD and it has existed there since before the 1969 Decree, and this is the same location contemplated by the Decree.

In opposition to the motion, Pacific Gas and Electric Company ("PG&E") argues that Poole's motion seeks to move, rather than correct, the location of the Abbott Ditch POD. PG&E contends that while the legal description set forth in "Schedule 2" may be erroneous, the "correct" location proposed by Poole is not the location set forth in the Decree. Instead, PG&E contends the true purpose of Poole's motion is to move the POD location in order to gain an advantage in ongoing disputes involving PG&E's plan to decommission a hydroelectric power project. PG&E currently diverts water from South Cow Creek through a powerhouse and subsequently along Hooten Gulch until it reflows into South Cow Creek. According to PG&E, by moving the Abbott Ditch POD to Hooten Gulch, instead of at South Cow Creek as specifically identified in the Decree, Poole can better argue that his water rights are being impacted by the opposed decommission of the powerhouse. PG&E alternatively argues that the Court lack jurisdiction to modify the Decree because it makes substantive changes to parties' rights by moving the POD, and it impacts the parties' riparian and appropriative rights.

The primary issue on this motion is whether the bearing and distance set forth in "Schedule 2" to the 1969 Decree accurately reflects the Court's intended location of the Abbott Ditch POD. The declaration of engineer Ed Whitson, which identifies the POD's legal description as on a hillside a distance from any water course. PG&E's concession that the legal description "may indeed be incorrect", is sufficient to lead to the conclusion that "Schedule 2" incorrectly states the bearing and distance of the POD. The secondary, and more complex, issue is whether Poole's proposed "corrected" legal description comports with the Decree.

Paragraph 27 of the 1969 Decree entitles various claimants to divert water "from the natural flow of the east channel of South Cow Creek as set forth in Schedule 6 though Abbott Ditch, at a point designated on SWRCB map as Diversion 73, as described in Schedule 2...." The SWRCB map, judicially noticed by the Court, referred to in the Decree, places Diversion 73 (the Abbott Ditch POD) along a line that the map's legend indicates is a creek, and at the head of Abbott Ditch. Diversion 73's placement on the SWRCB map also appears to match Poole's proposed corrected location of the POD, as demonstrated on the aerial map prepared and produced by PG&E in opposition to the motion, attached as Exhibit "A" to Wilson Declaration. Nonetheless, PG&E views the line in which Diversion 73 is located on the SWRCB map, as the lower portion of Hooten Gulch just before its confluence with South Cow Creek, and *not* as a second, smaller channel of South Cow Creek. Since the Decree only entitles the claimants the right to divert water from South Cow Creek, PG&E argues that there is no right to water from Hooten Gulch, and therefore the POD could not be located along Hooten Gulch as proposed by Poole. Upon lengthy review of the SWRCB map, the 1969 Decree, and the various historical documents produced by the parties, it appears that PG&E's characterization of the SWRCB map with respect to South Cow Creek at the time of the Decree, is mistaken.

The SW ¼ of Section 6, T31N R1W on the SWRCB map depicts South Cow Creek as splitting into two channels just above Diversion 72. The easternmost channel continues on until it intersects with Hooten Gulch, and then shortly thereafter rejoins the westernmost channel as one watercourse. The head of Abbot Ditch, as well as the designated location of Diversion 73, is along a portion of the eastern channel of the creek *after* its intersection with Hooten Gulch, but *before* its confluence with the western channel. This reading of South Cow Creek's course at the time of the Decree is supported by various documents.

The October 1911 Notice of change of point of Diversion of Water Right, attached as Exhibit "A" to Holder Declaration, describes the diversion of water from South Cow Creek "in to a slough or a natural water course about 20 feet wide, thence dow[n] said slough or water course to the Junction of Hooten Gulch [...] in a southwesterly direction to a point [...]" at which the water is re-diverted into a canal.

The December 1911 map of the Abbott and Jones Irrigation Canal, attached as Exhibit "B" to the Holder Declaration, also depicts South Cow Creek as dividing into two channels, in which water is described as "diverted by means of a dam across South Cow

Creek". The eastern channel is identified on the map as a "slough" that converges with Hooten Gulch at approximately the same place that South Cow Creek Road intersects Hooten Gulch. The eastern channel/slough and Hooten Gulch continue on the same course until rejoining the western channel of South Cow Creek. Again, the head of Abbott Ditch, the purported location of the POD, is located along a portion of the eastern channel of the creek *after* its intersection with Hooten Gulch, but *before* its confluence with the western channel. This demonstrates that at the time of the SWRCB map, in the SW ¼ of Section 6, T31N R1W, South Cow Creek divided into two channels consisting of a 20-foot wide eastern channel and a larger western channel, which converge just below the head of Abbott Ditch.

Whether the east channel of South Cow Creek, above the intersection of Hooten Gulch exists today, is unknown, but irrelevant for purposes of determining the intended POD location according to the 1969 Decree. At the time of the Decree, the water course at which Abbott Ditch, and the purported POD were located, was not solely Hooten Gulch, as PG&E claims. It was also considered a natural water course extending from South Cow Creek above Hooten Gulch. The SWRB's 1965 Report on Water Supply and Use of Water, for which the Court takes judicial notice, clearly confirms this in its description of the source of water for Diversion 73: "Water available for diversion consists principally of water discharged into Hooten Gulch through the South Cow Creek Powerhouse tailrace, although a small amount is also contributed by the eastern channel of South Cow Creek…"

Having determined that South Cow Creek consisted of a west and east channel in the area in which Poole claims is the correct POD location, the Decree's description of the Abbott Ditch POD matches the location of Diversion 73 on the SWRCB's map. This also explains the Decree's specification of the right to divert water from the natural flow of the *east* channel. PG&E points out that the POD has historically been in locations other than the head of Abbott Ditch. The Court does not disagree, but concludes that those historic locations pre-dated the location of the POD that was contemplated by the SWRCB and the 1969 Court. Proof of Claim No. 64, submitted by the Abbotts and contained in the SWRCB's Abstract of Proof of Claims, attached as Exhibit "C" to Holder Declaration, does nothing to refute the location of Diversion 73 as being at the head of Abbott Ditch. In fact, it confirms that the Abbotts claimed water from South Cow Creek through Diversion 73 as identified on the SWRCB's map.

The reference to a claim for water from "South Cow Creek", as opposed to specifying which channel, does not provide proof that the POD was in a location other than at the head of Abbott Ditch. The June 1911 and August 1911 notices of appropriation, attached as Exhibit "A" to Holder Declaration, fail to refute Poole's proposed corrected location of the POD. The notices' language that the claimants take water from "South Cow Creek" at a point on the "south side of the said stream" may be describing the taking of water from the south side of the east channel of South Cow Creek. While the October 1911 Notice of change of point of diversion of Water Right, Exhibit "A" to Holder Declaration, does seek to change the POD to a location upstream where South Cow Creek splits into the west and east channels, this notice is not

referenced anywhere within the SWRCB's Abstract of Claims or the 1969 Decree, and therefore appears to not be a document considered by the SWRCB or the Court in determining the location of Diversion 73.

The 2004 letter to PG&E, attached as Exhibit "F", identifies a POD north of Diversion 73, but specifies such existed "prior to 1907." The 2009 Affidavit of Steve Tetrick attached as Exhibit "J" also recognizes an "original diversion" north of the confluence of South Cow Creek and Hooten Gulch, but before the construction of the Kilarc-Cow Creek Project. The 2008 letter by Erik Poole, attached as Exhibit "H", also recognizes a "historical diversion point on South Cow Creek" but describes it having been not used in more than 100 years.

It is clear from the language of the 1969 Decree describing the location of the Abbott Ditch POD, and the location of Diversion 73 as identified on the SWRCB map incorporated by reference into the 1969 Decree, that the POD was intended to be located where Abbott Ditch diverts from the east channel of South Cow Creek, but that due to clerical error, the bearing and distance provided in "Schedule 2" was erroneous. Code of Civil Procedure section 473(d) provides that the court has the power to "correct clerical mistakes in its judgment...so as to conform to the judgment...directed."

Poole has submitted, based upon the calculation of Ed Whitson, the corrected bearing and distance for the POD.

In addition Paragraph 29 of the Decree reserves allows the court "to review this decree and to change or modify the same as the interests of justice may require." PG&E contends the proposed modification is a substantive change for which the Court lacks jurisdiction, the proposed change does not seek to move the POD. The Court concludes that the POD identified in the Decree was always intended to identify the POD location proposed by Poole. Modifying the bearing and distance in "Schedule 2" does not move the POD from South Cow Creek to Hooten Gulch (which PG&E fails to identify also as the east channel of South Cow Creek), but rather corrects the "Schedule 2" error so as to conform to the judgment directed. The correction of this error does not modify or materially alter the rights of any of the parties.

If the POD no longer provides water from South Cow Creek, so that the right to diversion no longer exists, this evidence has not been placed before the Court, and the determination of rights under the Decree is not at issue in this request to change the location of the POD.

The Court finds that the corrected bearing and distance of the POD proposed by Poole accurately reflects the location intended by the 1969 Decree.

The motion is granted. The Court will execute the Order to Amend or Modify the Cow Creek Adjudication Decree of the Abbott Ditch Point of Diversion in "Schedule 2" to reflect a N65° 0938"E bearing from reference corner, and a 1275 foot distance from reference corner.

Dated: January 30, 2012

JACK HALPIN
Superior Court Judge

CERTIFICATE OF MAILING and/or FAX
State of California, County of Shasta

I, the undersigned, certify under penalty of perjury under the laws of the State of California that I am a Deputy Court Clerk of the above-entitled court and not a party to the within action; that I mailed a true and correct copy of the above to each person listed below, by depositing same in the United States Post Office in Redding, California, enclosed in sealed envelopes with postage prepaid and/or FAX at the number(s) listed.

Dated: January 31, 2012 C. Thatcher, **Deputy Clerk**

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Comment 8b

State of California

THE RESOURCES AGENCY

STATE WATER RIGHTS BOARD

COW CREEK ADJUDICATION

REPORT ON

WATER SUPPLY AND USE OF WATER

ON

COW CREEK STREAM SYSTEM

SHASTA COUNTY, CALIFORNIA

MAY, 1965

State of California

THE RESOURCES AGENCY

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COW CREEK STREAM SYSTEM

SHASTA COUNTY, CALIFORNIA

MAY, 1965

APPROVAL AND ADOPTION BY
STATE WATER RIGHTS BOARD

The State Water Rights Board approves and adopts this report "Water Supply and Use of Water on Cow Creek Stream System, Shasta County, California" dated May, 1965.

/s/ Kent Silverthorne
Kent Silverthorne, Chairman

/s/ Ralph J. McGill
Ralph J. McGill, Member

/s/ W. A. Alexander
W. A. Alexander, Member

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The Resources Agency of California

STATE WATER RIGHTS BOARD

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Ralph J. McGill	Member
W. A. Alexander	Member

Leland K. Hill Executive Officer

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CHAPTER I. INTRODUCTION

This report presents factual information to aid claimants to water from Cow Creek stream system in preparing their proofs of claims of water rights which must be filed as the next step in the adjudication of water rights now in progress.

The Water Code of the State of California requires in an adjudication proceeding that the State Water Rights Board investigate the stream system, the location and capacity of all conduits diverting water, the lands irrigated or irrigable therefrom, and gather other data which may be required for a proper determination of water rights. This investigation has been made by the Board and the results are set forth in this report. Included are descriptions of the climatic and physical features of the area, water supply, and use of water. The report also summarizes measurements indicating the proper amount of water needed for irrigation of the lands. Appendices and tables are included to present more detailed information. Maps in the back of the report show the location of all streams and conduits, the lands served by them and the pattern of land ownership and use in 1964.

Legal Proceedings

On August 12, 1963, a petition was received by the State Water Rights Board requesting a determination of water rights on a portion of the Cow Creek stream system. The petition limited the determination to "the waters of Cow Creek stream system, excepting Clover Creek, Oak Run Creek, and North Cow Creek." Water rights on these three excluded streams are already defined by court decrees and water users there would derive little benefit from further adjudication proceedings.

A preliminary investigation and report was made by the staff of the State Water Rights Board setting forth facts and conditions on the stream system covered by the petition. On October 18, 1963, the Board concluded that the public interest and necessity would be served by proceeding with the determination requested in the petition and issued an order granting the petition. The order set December 2, 1963, as the date for the examination of the stream system to begin. The order recognized the requirements of Water Code Section 2500 by eliminating from the proceedings rights to extract ground water. Notice of the order was given by publication in the Redding Record Searchlight and Courier-Free Press for four consecutive weeks to notify all water users and others who might have an interest in the matter of the pendency of the proceeding. A copy of the order is included as Appendix D.

Scope of Investigation

Examination of the stream system was commenced by the State Water Rights Board on December 2, 1963, and continued until February 26, 1965.

During this period all physical facts deemed essential to the proper determination of water rights involved in the proceedings were investigated.

A map entitled "Cow Creek Stream System Showing Diversions and Irrigated Lands, Shasta County, California, 1964," was prepared from data collected during the investigation. A copy of this map is included in this report on five sheets as Plate 1 and is referred to as the State Water Rights Board Map. Physical features on the map were obtained from aerial photographs taken in 1952 and 1962. Topography from United States Geological Survey quadrangles prepared in 1953 and 1956 and Shasta County Assessor's maps prepared from the 1962 aerial photos were also used. Names of property owners and location of property lines were obtained from the Shasta County Assessor's records.

Diversion systems, lands irrigated therefrom and crops being grown were determined in the area during the 1964 irrigation season, and are shown on the State Water Rights Board Map. Lands normally irrigated but left fallow or idle and not irrigated in 1964 are shown separately on this map. Lands not previously irrigated but being prepared for future irrigation are also shown separately. Lands shown in Table A-1 as irrigated in 1964, idle in 1964, and under construction in 1964 (i.e. being prepared for irrigation) comprise the lands deemed irrigable from the diversion systems described in Table A-4.

Water Problems

Irrigation in the Cow Creek area first started in the hilly portion of the watershed where streambed gradient was steep enough to allow ditches to be built to divert water to the land by gravity. Irrigation of lands

bording the creek below Palo Cedro where stream gradient is flat came later when pumps were developed which could lift the water out of the entrenched stream channel for application to the land. Still later sprinkler irrigation systems operated in conjunction with pumps came into use to irrigate hilly upper watershed land as well as level valley land. As time passed, progressively more advanced irrigation systems have been developed bringing under irrigation new land not considered irrigable under previous standards of farm practice.

In most years the flows of the main streams such as Old Cow, South Cow, and Cow Creeks are adequate to satisfy present irrigation requirements. However, shortages have occurred in some dry years. In addition, temporary shortages are not uncommon because of diversion of large amounts of water into upper ditches for brief periods of time. While the stream system as a whole may have an adequate water supply, the supply on individual tributaries is occasionally deficient.

The earliest controversy over water in the stream system recorded in Board files is the legal action "The Big Cow Creek Ditch Company v. Peter Hufford, et al." filed in 1929. The plaintiff ditch company had been diverting water from Cow Creek new Millville under a water right permit issued by the State on Application 237. The complaint by the company alleged that the defendants, comprising most of the water users on Old Cow and South Cow Creeks upstream from the company's diversion, were illegally diverting water away from the natural stream channels, thus depriving plaintiff of its prior right to this water.

The Superior Court of Shasta County referred the case to the former State Division of Water Rights as referee. However, it was discovered that

the defendants were improperly served with the complaint, making the reference to the State premature and illegal. A new action was filed, in which the defendants were properly served, and in June of 1931 the plaintiff ditch company petitioned the court to again refer the action to the State. A group of the defendants opposed the petition for reasons not apparent in Board files, and the court refused to grant the petition. Court records show that this action was never carried through to a final decree.

The next attempt to adjudicate water rights in the area occurred in 1937 when the Superior Court of Shasta County referred another suit to the State as referee. This reference actually consisted of two closely related cases involving rights to divert water from the portion of South Cow Creek lying upstream from the South Cow Creek powerhouse. In both actions Pacific Gas and Electric Company was plaintiff and all upstream water users defendants. Following instructions from the court the State Division of Water Resources investigated the South Cow Creek stream system and filed its factual report with the court. Again, as in the previous case of 1929, court records show that this matter was never carried to a conclusion and final decree.

In 1960 an engineer from the Board met with several users on South Cow Creek at their request, to aid in solving a controversy over alleged excessive diversion of water. Investigation showed a shortage of water in certain reaches of the stream which was caused partially by expansion of irrigated acreage and increased use of water.

In the dry years of 1961, 1962, and 1964, summer flow of Cow Creek was very low. Downstream from Millville, some of the pumps diverting from the stream were forced to cease pumping for varying periods of time.

Organization of Report

The report is presented under three chapters as follows: I. Introduction; II. Description of Investigated Area; III. Water Supply and Use of Water. Four appendices follow the text and include (A) Descriptions of Places of Use and Diversion Systems; (B) Records of Water Supply and Use of Water; (C) Applications before the State Water Rights Board; and (D) Order Granting Petition for Determination of Water Rights. Two plates inside the back cover consist of (1) the State Water Rights Board Map, and (2) hydrographs of Cow Creek.

Points of diversion on Old Cow Creek have been numbered consecutively from 1 through 39, starting at the uppermost diversion and continuing downstream. Diversions from South Cow Creek watershed are numbered from 40 through 75; and those below the confluence of these streams 76 through 116.

CHAPTER II. DESCRIPTION OF INVESTIGATED AREA

The Cascade Mountain Range extends over 650 miles through the States of Washington and Oregon and into Northern California. The range is a broad northward-trending series of giant volcanoes ranging in age from Pliocene to Recent (12 million years ago to the erruption of Mount Lassen in 1915). Vast amounts of basaltic and andesitic lava have poured from these volcanoes, raising ground surface by hundreds of feet in the higher watersheds.

Since the formative period, Cow Creek and tributaries have drained rain and melting snow down a small portion of the western flank of these mountains in Shasta County. The Cow Creek tributaries have eroded through the lava cap and exposed the older sandstone or shale formations lying beneath. The porous lava rock along the crest of the mountains provides a valuable natural reservoir for precipitation falling on the ground surface in the winter. Cracks, large fissures, porosity in rocks, and even cavernous tubes within the rock provide the water storage space and, equally important, furnish frictional resistance to flow through the rock, thus reducing water velocity sufficiently to prolong the flow until the summer when it can be used for irrigation.

Water percolating through the lava eventually reaches the underlying relatively impervious sandstone or shale formation. The floor formed by this material conducts the water along the slope of the contact plane until ground surface is intersected on some eroded canyon wall or mountain slope. At such lines of contact large springs are frequently found.

Natural Features

Old Cow Creek and South Cow Creek roughly parallel each other in a southwesterly course from their mountainous source downward to their confluence above the main Cow Creek Valley. The upper three-fourths of the watershed of the stream system consists of fairly steep mountainous slopes covered by coniferous timber of commercial importance or on some dry southerly exposures by thickets of manzanita, ceonothus, and similar brush types with black oak and digger pine.

Old Cow Creek rises at approximately 6,400 feet elevation and flows in a southwesterly direction about 30 miles to its junction with South Cow Creek about three miles east of Millville. The area of the watershed is about 80 square miles. Main tributaries to Old Cow Creek include Hunt Creek, Glendenning Creek, Canyon Creek, and Coal Gulch.

South Cow Creek rises at approximately 6,200 feet elevation and flows in a westerly direction about 26 miles to its junction with Old Cow Creek. The area of this watershed is also about 80 square miles. Some of the larger tributaries are Atkins Creek, Beal Creek, Hamp Creek, and Mill Creek.

The main stem of Cow Creek begins at the confluence of South Cow and Old Cow Creeks and flows westerly for about eight miles, past Millville, and near Palo Cedro turns south and flows eight more miles to its junction with the Sacramento River about four miles east of Anderson. The ground elevation at the mouth is about 325 feet.

One-quarter of the watershed that is near and below the confluence of Old Cow and South Cow Creeks consists essentially of level

valley floor lands rimmed on either side by low confining foothills which support growths of blue oak and native grasses. Thickets of willow, alder, and cottonwood border the stream channel. The stream gradient in this section is relatively flat and the irrigable lands are level and nearly continuous on either side of the stream.

Climate

The climate of the lower part of the stream system is typical of the Upper Sacramento Valley, having moderately cold wet winters and warm dry summers. Winter temperatures at the higher elevations in the upper watershed are considerably colder and snow is common. Over the watershed as a whole about 80 per cent of the precipitation falls in the six-month period from October through March.

Precipitation

The precipitation records maintained at Redding nine miles west of Palo Cedro are indicative of the precipitation pattern in the lower Cow Creek watershed. The 30-year mean monthly precipitation at this station and the 1963-64 monthly precipitation are presented in Table 1.

Precipitation records kept by the Pacific Gas and Electric Company at Kilarc Powerhouse at an elevation of 2,700 feet on Old Cow Creek are representative of upper watershed conditions. The 32-year mean monthly precipitation at this station and the 1963-64 monthly precipitation are presented in Table 1.

Isohyetal maps prepared by the Department of Water Resources for its Bulletin 22, Shasta County Investigation, show mean annual precipitation ranging from 27 inches at the mouth of Cow Creek to about 60 inches at the headwaters.

TABLE 1

MONTHLY PRECIPITATION AT REDDING AND KILARC POWERHOUSE

In inches

Month	Redding		Kilarc Powerhouse	
	U. S. Weather Bureau mean*	1963-64	32-year mean**	1963-64
October	2.27	2.36	3.39	2.56
November	3.76	8.88	4.99	10.03
December	7.26	0.56	7.06	1.37
January	7.69	5.15	7.06	6.42
February	6.19	0.17	6.43	0.50
March	4.90	1.67	5.58	3.13
April	2.95	0.01	3.94	1.04
May	1.74	0	2.98	2.79
June	1.13	1.68	1.28	2.35
July	0.11	0	0.14	0
August	0.13	0	0.16	0
September	0.61	0.30	0.82	0.63
TOTALS	38.74	20.78	43.83	30.82

* Climatological normal based on the period 1931-1960.

** 1932-33 through 1963-64.

Much of the winter precipitation in the watershed above about 3,500 feet occurs as snow which is retained into the spring months. Summer precipitation consists of infrequent rains of short duration. Such rains, however, are not consistent enough to be relied upon for irrigation needs.

Growing Season

Data published by the United States Weather Bureau show that at Redding temperatures vary from a few degrees below freezing in the winter to a few degrees above 100 in the summer. The length of the growing season is generally limited to the frost-free period between the last freezing temperature (32° or less) in the spring and the first freezing temperature in the fall. The frost-free periods as recorded at the Redding Station for each year since 1948 are presented in Table 2 and average 266 days. The Redding records are presented as indicative of length of growing season in the lower portion of Cow Creek stream system below Millville.

Dates of first and last frosts from records kept at the Volta Powerhouse in the Battle Creek watershed nine miles south of South Cow Creek at elevation 2,200 feet are also presented in Table 2 as an approximation of growing season within the upper Cow Creek stream system above Millville. The average length of the frost-free period there is 218 days. It should be noted that irrigated pasture and certain other crops are able to survive temperatures below freezing and growth is able to proceed at a very slow rate, even during the winter months. The period of active growth generally begins with the advent of warm weather in March and ceases by the end of October when the days become shorter and cooler.

TABLE 2

DATES OF KILLING FROSTS AT REDDING
AND VOLTA POWERHOUSE

Year	Last spring frost		First fall frost		Length of growing season, days	
	Redding	Volta PH	Redding	Volta PH	Redding	Volta PH
1948	May 1	Apr. 3	Dec. 4	Nov. 7	217	218
1949	Feb. 14	Mar. 29	Dec. 11	Dec. 10	300	256
1950	May 4	Apr. 14	Nov. 13	Dec. 1	237	231
1951	Apr. 1	Apr. 30	Nov. 22	Nov. 22	235	206
1952	Mar. 20	Apr. 14	Nov. 24	Nov. 23	248	222
1953	Mar. 17	May 1	Nov. 20	Nov. 19	248	202
1954	Mar. 19	Mar. 17	Nov. 30	Nov. 30	256	258
1955	Apr. 2	Apr. 27	Nov. 12	Nov. 12	224	199
1956	Mar. 6	Mar. 27	Oct. 27	Nov. 20	235	238
1957	Feb. 5	Mar. 22	Dec. 8	Oct. 3	306	195
1958	Jan. 8	Mar. 16	Nov. 17	Nov. 15	313	244
1959	Feb. 8	May 3	Dec. 13	Dec. 8	308	219
1960	Mar. 1	May 21	Nov. 27	Nov. 15	271	178
1961	Jan. 21	Apr. 22	Dec. 10	Oct. 28	323	189
1962	Mar. 10	Mar. 23	Dec. 26	Nov. 29	291	251
1963	Mar. 17	Apr. 21	Dec. 3	Nov. 21	261	214
1964	Mar. 7	May 4	Nov. 13	Nov. 13	251	193
	AVERAGE LENGTH OF GROWING SEASON				266	218

Development

The first development in the Cow Creek area occurred in 1853 when two brothers, S. E. and N. T. Stroud, settled in the Millville area. The settlement grew for a few years and at one time in the early 1860's was supposed to have been the second largest town in Shasta County.

The first resident in the valley below the South Cow Creek Powerhouse was Erastus Wagoner who in about 1855 settled on a homestead which is to this day a part of the Wagoner Ranch.

In 1863 Simon Whitmore settled on land farther east and provided the nucleus for a settlement known as Tamarack for the first 20 years of its existence. Growth here was quite slow until about 1883 when a post office was opened, and the town name changed to Whitmore, in honor of its first settler. By this time several ranches had been established in the area and Whitmore became a small trade center. In those days farming was more diversified than now, with fruit, wheat, corn, hops and vegetables being produced.

Irrigation in the Cow Creek area began shortly after homesteading on many of the ranches. Full development of the lands now being irrigated by diversion from the stream system was slow, however, and it was not until after the turn of the century that some of the ranches were homesteaded and irrigated.

Land ownership in the mountainous upper watershed today consists of large parcels owned and operated by lumber companies to produce pine and fir timber and smaller parcels of irrigated land owned by persons interested primarily in ranching.

A small acreage in the extreme eastern portion of the area is within the Lassen National Forest, and a larger tract of about 9,000 acres in this area comprises Latour State Forest.

The lower watershed near Millville and Palo Cedro is divided into numerous smaller parcels owned mainly by ranchers. However, some of the lower farms have been subdivided and serve as suburbs of Redding and Anderson which are located a few miles to the west.

Soils

The adaptability of soils in the Cow Creek area to irrigated crops is an important consideration in the determination of water rights. This section of the report comments on soil formation in general and describes the properties of some of the common soil types in the Cow Creek area which are irrigated.

The agricultural quality of soil is measured by characteristics such as texture, permeability, fertility, and slope. These characteristics reflect, to a large degree, the nature of the parent rock from which the particular soil was formed. From the day of its creation the parent rock is subjected to the soil forming forces of climate, bacteria, and vegetation which break down the rock and develop a soil mantle with unique properties. The soil thus formed is subject to the erosive action of water and in times of flood may be transported miles downstream to be deposited in the lower valleys as alluvium.

As noted previously the Cow Creek area has been the scene of extensive volcanic activity within fairly recent geologic history. Basaltic and andesitic lava flows and loose volcanic material covered the area with

a blanket or cap, thickest near the headwaters of Cow Creek and tapering off toward the west. Beneath this material and to the west lie older formations, principally shale and sandstone.

The soil series found in the Cow Creek area below Millville were first mapped, classified, and reported by the U. S. Department of Agriculture in a bulletin entitled "Soil Survey of the Redding Area, California" published in 1908. Since then, land classification surveys have been made by the U. S. Bureau of Reclamation in 1957 over the lower portion of the watershed and by the State Department of Water Resources in 1962. In addition to these, the U. S. Soil Conservation Service in cooperation with the State of California is currently conducting a soils survey which includes the mountainous portion of the Cow Creek stream system as well as the lower portion. The published and preliminary results of these various surveys have been used in preparing the following portion of this report.

Lower Area

The irrigated lands in the lower area consist entirely of nearly level valley floor lands lying along the stream channel. With the exception of narrow strips of rocky river wash soils immediately adjacent to stream channels, the level soils in this area are all suitable for irrigation. The best of these are more than 36 inches deep and range in texture from sandy loam to friable clay loam. The poorest of the irrigable soils are shallow and light in texture. They also frequently have high gravel content and may be of steeper slope. Hardpan is quite rare.

A wide variety of soil series is found in the area, depending on the source of parent material and the age of the soil. Some soils

consist of alluvium which originated from the basaltic and andesitic vocanic soils higher in the watershed. These are fertile, well drained, and permeable and textures range from loamy sand to clay loam. These types include the Molinos, Vina, and Los Robles soil series.

Other adjacent soils were deposited as alluvial fans at the mouths of small local tributary streams. These soils reflect the shale or sandstone nature of the parent material lying either beneath or west of the lava flows and are more clayey and less permeable than those deposited by the main Cow Creek tributaries draining the higher watershed. The Myers series is typical of these soils.

Upper Area

The recent alluvial soils found in the valleys in the upper area are generally of the same type and quality as the lower area soils similarly situated. Above 2,000 feet elevation, however, the Nanny series is common as alluvium on level or gently sloping topography. These soils support excellent stands of timber and when cleared produce well under irrigation. Irrigation in the higher portion of the stream system is not restricted to the level valley soils. In several cases steep hillside soils have been irrigated for years. Some of these soil series such as Guenoc, Toomes, and Kilarc would ordinarily be classed as nonirrigable due to their steepness, rockiness and shallowness.

Most of these hillside or plateau soil types were formed in place from unaltered basaltic lava flow rock, or as in the Kilarc soils, from weakly consolidated sandstone. The soils are usually rocky and contain a high percentage of gravel.

CHAPTER III. WATER SUPPLY AND USE OF WATER

Knowledge of the water supply available from the several streams comprising the Cow Creek stream system is a basic prerequisite to a determination of water rights. Data on diversion and use of water are equally important and must be collected and recorded. This chapter presents the results of water supply measurements, measurements of diversion of water and its use.

Water Supply

The water supply of Cow Creek stream system, although unregulated by storage reservoirs, can usually be depended on to satisfy present requirements throughout the irrigation season. However, even in normal water supply years temporary shortages occasionally occur because of uncoordinated diversions through the large ditches. In dry years shortages are of longer duration and may occur throughout the stream system.

Average annual runoff for the entire stream system since 1950 when the United States Geological Survey established the Cow Creek gaging station has been 450,000 acre-feet, equivalent to an average runoff depth of 1.6 feet over the entire watershed area of 430 square miles. South Cow Creek and Old Cow Creek produce about 75,000 acre-feet each.

The runoff records show that for the stream system as a whole about 23 per cent of the annual runoff occurs in the six-month period, April through September. The remaining 77 per cent flows into the Sacramento River during the winter. The summer flows of the Old Cow

Creek and South Cow Creek portions of the watershed, however, are better sustained with the April through September flow comprising about 33 per cent of their total annual runoff. The pattern of Cow Creek annual runoff is shown graphically on Plate 2 at the back of this report. The hydrographs are of the flow of Cow Creek at the U. S. Geological Survey Station during a very wet year (1962-63) and a very dry year (1963-64).

Ideally, water supply is measured on a stream at a point upstream from all diversions. On the Cow Creek stream system, measurements at such points would not give a true measure of water supply since large springs and tributary water courses occur downstream from some of the diversions. As a consequence, streamflow was measured during the investigation at key points which in many cases were a considerable distance downstream from the headwaters. Other factors considered in the selection of measuring stations were accessibility and stream channel conditions which would allow reasonably accurate flow measurements to be made.

To supplement the water supply records provided by the stations of the United States Geological Survey on South Cow Creek and Cow Creek, water stage recorders were installed and maintained by the State Water Rights Board at three other locations. These were on South Cow Creek above the German Ditch, on Glendenning Creek below its confluence with Bear Gulch, and on Cow Creek below the confluence of Old Cow Creek and South Cow Creek. The relationship between gage height as measured by the recorder and discharge as measured by current meter was determined for each of these stations. From this relationship, daily mean discharge in cubic feet per second was obtained and tables prepared and included in Appendix B.

Staff gages were installed at numerous locations in other stream channels. Frequent readings of gage height together with current meter measurements of the flow have been used in estimating flows in these streams. Information on water supply for each major tributary is presented below.

Old Cow Creek

Occasional measurements were made during the 1964 irrigation season of the flow of Old Cow Creek at the Ponderosa Way Bridge just above the Kilarc Powerhouse. Flow past this station plus discharge through the powerhouse comprises the natural flow of Old Cow Creek impaired by diversion through the Murphy Ditch and the Grindlay-Williams Ditch (Diversions 5 and 6, respectively). Any additional impairment caused by the small upper watershed diversions is insignificant.

Discharge through the powerhouse is the sum of the flow measured by the water stage recorder on the Kilarc Powerhouse Ditch (Diversion 3) and the flow measured in the Pacific Gas and Electric Company Canyon Creek Ditch (Diversion 4).

Computed monthly average streamflow below the powerhouse tailrace for 1964 is tabulated below:

Month	Average discharge in cubic feet per second
May	50
June	47
July	34
August	27
September	28

Streamflow downstream from the powerhouse tailrace on Old Cow Creek was sufficient in 1964 to maintain a live stream throughout its length. However, large amounts of return flow from all irrigated lands along the creek were of critical importance in maintaining an adequate water supply to fill the needs of all downstream diverters.

Important tributaries to Old Cow Creek are Hunt Creek and Canyon Creek upstream and Glendenning Creek downstream from the Kilarc Powerhouse.

Glendenning Creek

This creek is the largest tributary to Old Cow Creek below the Kilarc Powerhouse. A water stage recorder was maintained on the stream about 1/8 mile below Ponderosa Way Bridge ($1\frac{1}{4}$ miles upstream from its confluence with Old Cow Creek) during the 1964 irrigation season. The daily mean flow past this station is presented in Table B-2. During August of 1964 the flow averaged 3.4 cubic feet per second. The flow at this point represents the contribution of Glendenning Creek to Old Cow Creek as imparied by diversions to the Grindlay and Neely Ranches, and as augmented by return flow from lands irrigated by the German Ditch (Diversion 43) from South Cow Creek. This return flow reaches Glendenning Creek via Bear Gulch and Dailey Creek and averaged about 1.5 cubic feet per second during the 1964 season. Were it not for water importations through the German Ditch, the flow of Glendenning Creek would be quite small during the summer months.

A staff gage was maintained on Bear Gulch at Tamarack Road to evaluate its contribution to Glendenning Creek and intermittent measurements of flow at this station are presented in Table B-8.

Similar flow records were obtained on Dailey Creek at Tamarack Road and are also contained in Table B-8.

South Cow Creek

A continuous record of flow of South Cow Creek just upstream from the German Ditch diversion dam was obtained by using a water stage recorder during 1964 and is presented in Table B-3. Flow at this station represents the full natural flow of the stream impaired only by a diversion of about 2 cubic feet per second through the Beal Creek Ditch (Diversion 42) after August 29, 1964, when this ditch was first opened for the year. The effect of other upstream diversions is insignificant. Flow past the station averaged 18.2 cubic feet per second during August of 1964.

A few measurements were also made of the flow of South Cow Creek at the Ponderosa Way Bridge two miles downstream from the German Ditch diversion dam. These measurements are shown in Table B-8.

A third point of measurement of South Cow Creek was a short distance above the Wagoner Ditch and above the confluence of South Cow Creek with the tailrace channel (Hooten Gulch) of the South Cow Creek Powerhouse. Table B-8 contains the results of intermittent measurements at this point.

The fourth and last point of measurement on South Cow Creek is at the U. S. Geological Survey gaging station located 2½ miles from its confluence with Old Cow Creek. This station is below all diversions and irrigated lands on the creek and the record of flow represents the contribution of South Cow Creek to Cow Creek as impaired by all upstream

diversions and as enhanced by return flows. Preliminary records of daily mean discharge are presented in Table B-6. During August of 1964 the flow averaged 10.9 cubic feet per second.

The flow of South Cow Creek throughout its length was sufficient to satisfy all irrigation demands in 1964. However, as is true of all streams in the area under investigation, the only way these demands were met was by large amounts of return flow from irrigation.

Atkins Creek

Atkins Creek is tributary to South Cow Creek upstream from Ponderosa Way Bridge. A staff gage was maintained during the 1964 irrigation season in the stream at Bateman Road and frequent streamflow measurements and gage height readings were made. From these measurements daily mean discharge was estimated and is presented in Table B-4. Dry season flow past the station was constant, averaging 2.3 cubic feet per second during August. Water is diverted above the station for irrigation of the Elmer Hufford, Knight, and Worden Ranches.

Mill Creek

Mill Creek is tributary to South Cow Creek from the north. Its discharge is comprised of natural flow in its northern branch, Covey Creek, and of natural flow and water brought in through the German Ditch from South Cow Creek in its southern branch.

A staff gage was maintained in Mill Creek during the 1964 season at the Mill Creek Road. The stream section was rated by current meter and frequent gage height readings were made. The discharge record is presented in Table B-5. This flow was constant, averaging about

6 cubic feet per second during the irrigation season. It represents the water supply available for diversion into the Pacific Gas and Electric Company's Mill Creek Ditch (Diversion 71). It also represents the contribution of water from Mill Creek to South Cow Creek.

Cow Creek

Cow Creek is formed by the confluence of Old Cow Creek and South Cow Creek which contribute water in about equal amounts during the irrigation season. Tributaries to Cow Creek in downstream order are Basin Hollow, Clover Creek, Oak Run Creek, and North Cow Creek, also known as Little Cow Creek.

During the irrigation season of 1964 a water stage recorder was maintained on Cow Creek $1\frac{1}{4}$ miles below the junction of Old Cow and South Cow Creeks. Daily mean discharge obtained at this station is presented in Table B-7. Flow passing the station represents very nearly the entire supply to all lower pumps after about July 1. By this date the downstream tributaries such as Clover Creek, Oak Run Creek, and North Cow Creek contribute very little water. During August of 1964 the flow averaged about 15 cubic feet per second at the station.

A U. S. Geological Survey gaging station is located on the lower end of Cow Creek about three miles above its confluence with the Sacramento River. Table B-1 presents preliminary records of daily mean discharge at this station for the 1964 irrigation season. During the summer months the flow at this point is a measure of Cow Creek water available to the pumps located downstream. During these months, however, the stage of the Sacramento River is high enough to cause water to back

up in Cow Creek to the Dersch Road Bridge and the water supply below this bridge is a mixture of water from both sources.

During 1964 the flow in Cow Creek (between the junction of Old Cow and South Cow Creeks and its terminous at the Sacramento River) was sufficient to satisfy all irrigation demands except for about one week in late August when at least one pump was forced to shut down because of the low flow. There have been similar reports of insufficient flow in recent years.

Use of Water

Most of the summer flow of the stream system is used in furnishing the consumptive use requirements of irrigated crops. Total simultaneous diversion for irrigation in midsummer is about 170 cubic feet per second. Use of water for power generation is also important, and total simultaneous diversion during the spring runoff is about 100 cubic feet per second. After passing through the powerplants the water is available for diversion for irrigation.

Detailed description of use of water through each diversion system is contained in Table A-4.

Losses in Ditches and Channels

The reduction in ditch flow between the point of diversion and the place of use is termed "ditch loss." Its magnitude depends on several factors including permeability of ditch bank and bed, length of ditch, condition of ditch and wetted perimeter.

The German Ditch was selected for loss measurements as representative of the large ditches in the area. Current meter measurements

were made of ditch flow at the head and 1.38 miles down the ditch at the recorder station above all laterals. This reach of the ditch is reasonably well maintained although there is some leakage from flumes. The ditch runs through heavy timber and there is undoubtedly some water lost to transpiration by this vegetation. Water velocity is swift enough to prevent weed growth which could obstruct the flow of water. In view of all factors affecting ditch loss, it is believed that conditions on the German Ditch are representative of conditions throughout the Cow Creek stream system. The average loss is 1.1 cubic feet per second per mile and the results of the measurements are shown in Table 3. Ditch losses similar to those measured here could be expected on other reasonably maintained Cow Creek ditches of similar size.

The Grindlay lateral of the Grindlay-Williams Ditch was chosen as typical of small ditches. Measurements in August of 1964 show 1.65 cubic feet per second entering the lateral with 0.95 cubic foot per second measured at a point 2.03 miles downstream, above the place of use, indicating a total loss of 0.7 cubic foot per second. Although the ditch is in rather porous soil and the loss is probably a little greater than would be expected in some well maintained ditches of similar size in other areas of the Cow Creek stream system, a loss of this amount probably is not far from average.

Numerous springs throughout the upper half of the Old Cow and South Cow Creek watersheds cause accretions to streamflow that more than offset stream channel losses. There are minor net losses, however, in the lower section of Cow Creek channel. Measurements made in August and in October of 1964 before the first fall rain showed an average channel

TABLE 3

DITCH LOSS MEASUREMENTS ON
GERMAN DITCH
1964

In cubic feet per second

Date	Ditch flow*		Loss
	Head of ditch	At recorder	
June 12	11.7	10.8	0.9
June 26	11.8	10.8	1.0
July 15	11.9	10.1	1.8
July 24	12.4	10.1	2.3
August 7	12.2	10.7	1.5
August 21	12.8	11.2	1.6
September 3	12.1	11.0	1.1
Average	12.1	10.7	1.5

Average loss per mile = 1.1 cubic feet per second

*Measurements made by current meter.

loss of 3 per cent per mile in a two-mile reach of Cow Creek below Millville. Average rate of flow of the creek was about 20 cubic feet per second. The upper point of measurement was just below the confluence of Clover Creek with Cow Creek, and the lower point was just below Silverbridge Road. The amount of water being pumped from the creek between these two points was deducted so as not to be included as a channel loss.

Irrigation Use and Duty of Water

There are about 5,800 acres of land irrigated by diversion from the stream system. Diversion from Old Cow Creek supplies 2,750 acres and diversion from South Cow Creek supplies 1,470 acres, with the remaining 1,580 acres being irrigated by diversion from the main stem of Cow Creek.

There are only minor importations of water into the drainage area. One importation consists of about 0.3 cubic foot per second brought into the Hagaman Gulch watershed from Dickerson Creek to the south. Two small diversions from Dickerson Creek furnish irrigation water to 12.6 acres on the Darrell W. Faber property and domestic water to a cabin on the Clara Firth property. About 0.5 cubic foot per second is imported from Clover Creek through the Guttman Ditch for irrigation of about 25 acres on property owned by R. Whitney.

Irrigated pasture is the largest irrigated crop in the area. Nearly all the remaining irrigated lands are cropped to meadow hay or alfalfa hay, both of which may also be pastured. A large number of small gardens and orchards are also irrigated but do not aggregate a large

acreage. The paragraphs that follow pertain primarily to irrigated pasture but are also applicable to meadow hay and alfalfa whose water requirements are quite similar.

Duty of water is defined for purposes of this report as the number of acres irrigated under existing customs and practices by one cubic foot per second of water flowing continuously.

While it is recognized that there are slight differences in waterholding capacities of the various soils being irrigated, and corresponding variations in duty of water, there is a close enough similarity between the different soil types in this area to treat them as one group without attempting to determine separate water requirements for each soil type. A major difference in water requirement or duty of water was noted, however, for lands irrigated by pump diversions and lands irrigated by gravity diversions, and the following discussion on duty of water treats these two methods of irrigation separately.

Pump Diversions. Fourteen pumps diverting water from Cow Creek were chosen for duty of water measurements. Five diverted water for sprinkler systems, eight diverted water for irrigation by flooding border checks, and one diverted water for use by both methods. Discharge of all fourteen pumps was measured by Cox Flow Meter and monthly records of power consumption were obtained. The acreage irrigated by each pump was measured and the irrigation practices under each system were noted throughout the irrigation season. Land surface of all of the irrigated fields was quite smooth and level. Eleven of the fourteen pumps measured were used in a manner considered to be normal and representative of irrigation practices in the area. These eleven pumps irrigated pastures

growing mixed clover and grass species or crops of alfalfa hay and were operated so as to supply adequate amounts of water to the fields. The season of irrigation ran from about April 10 to October 27 when the first heavy rainfall of the year effectively ended irrigation.

The following tabulation summarizes the duty of water measurements for lands served by the observed pumps in the Cow Creek stream system. Table B-13 sets forth more details of the measurements.

Method of pump irrigation	Depth of applied water, in feet	Duty of water (acres irrigated by 1 cubic foot per second)	
		Entire season	Maximum month
Sprinkler	3.91	102	78
Border Check	4.86	82	59

From these measurements it is concluded that seasonal duty of water requirements for pump-irrigated pasture in the Cow Creek area are one cubic foot per second to 100 acres under sprinkler irrigation and one cubic foot per second to 80 acres under border check. However, during the month of maximum demand the required duties are at the increased rates of one cubic foot per second to 80 acres under sprinklers and one cubic foot per second to 60 acres under border checks which are deemed to be reasonable duties proper for purposes of this report.

The duty of water requirements just described are of similar magnitude to those determined in other adjudications in this vicinity and to those used by the State Department of Water Resources.

Gravity Diversions. In 1964 water stage recorders measured water deliveries through the Bassett Ditch (Diversion 36) and the German Ditch (Diversion 43). The tabulation on the following page presents the duty of water for these ditches. All water diverted by the Bassett Ditch is used for irrigation. On the German Ditch, however, only 73.6 per cent

of the water diverted is for irrigation, and the measured flow through the ditch has been reduced accordingly in the tabulation. The remaining 26.4 per cent is diverted for delivery to Mill Creek and eventual use in generating power at the South Cow Creek Powerhouse.

Ditch	Period of measurement	Acre-feet diverted for irrigation	Acreage irrigated	Duty of water (acres irrigated by 1 cubic foot per second)
Bassett Ditch	May 1-Oct.27	8,724	963	40
German Ditch	May 7-Oct.28	2,800	335	42

In this tabulation the point of measurement of the water diverted through the Bassett Ditch was at the water stage recorder located in the ditch about 0.6 mile below the diversion dam. The point of measurement on the German Ditch was at the recorder located 1.38 miles below the diversion dam. Additional amounts of water to offset ditch losses would have to be diverted at the head of each ditch to obtain these duties.

These measurements indicate that a duty of one cubic foot per second to 40 acres under gravity ditch is reasonable in the Cow Creek stream system. Lands irrigated by gravity diversions are generally of much steeper slope and are much rougher on the surface than the lower lands irrigated by pumps. Consequently, more water is required for their proper irrigation. Many of the ditches in the area have very low duties. In some cases as few as 10 acres are irrigated by one cubic foot per second. However, in view of the excessive amounts of surface drainage from lands irrigated by these diversions observed in 1964, it is reasonable to believe that improved irrigation practices could extend the duty of water to the one cubic foot per second to 40 acres found

Trout fishing is also of importance in the perennial streams. Of perhaps more importance are the salmon and steelhead spawning gravel beds in the middle section of Cow Creek channel and tributaries. The Department of Fish and Game estimates the average fall king salmon run to be 1,460 fish. Spring run salmon are barred from the good spawning areas by diversion dams.

APPENDIX A

DESCRIPTION OF PLACES OF USE AND DIVERSION SYSTEMS

TABLE A-1

DESCRIPTION OF PLACES OF USE

(All descriptions refer to Mount Diablo Base and Meridian)

Abbott, Allan G. and Abbott, Blanche

Lands irrigated in 1964:

11	acres in NE¼ of SE¼ of Section 11,	T31N, R2W
0.2	acre in SE¼ of SE¼ of Section 11,	T31N, R2W
15	acres in NW¼ of SW¼ of Section 12,	T31N, R2W
8.4	acres in NE¼ of SW¼ of Section 12,	T31N, R2W
1.0	acre in SW¼ of NW¼ of Section 12,	T31N, R2W
11	acres in SE¼ of NW¼ of Section 12,	T31N, R2W
16	acres in SW¼ of NE¼ of Section 12,	T31N, R2W
12	acres in NW¼ of NE¼ of Section 12,	T31N, R2W
19	acres in NE¼ of NE¼ of Section 12,	T31N, R2W
2.4	acres in NW¼ of NW¼ of Section 7,	T31N, R1W
96.0	acres - Total	

Albert, Wertzel and Albert, Mabel H.

Lands irrigated in 1964:

3.2 acres in NW¼ of SE¼ of Section 32, T33N, R1E

Atkins, Leary B.

Lands irrigated in 1964:

4.1	acres in NE¼ of SE¼ of Section 7,	T32N, R1E
15	acres in NE¼ of SW¼ of Section 7,	T32N, R1E
34	acres in Lot 3 of Section 7,	T32N, R1E
3.2	acres in Lot 4 of Section 7,	T32N, R1E
2.4	acres in NE¼ of SE¼ of Section 12,	T32N, R1W
0.6	acre in SE¼ of SE¼ of Section 12,	T32N, R1W
12	acres in SW¼ of SE¼ of Section 12,	T32N, R1W
2.4	acres in SE¼ of SW¼ of Section 12,	T32N, R1W
21	acres in SW¼ of SW¼ of Section 12,	T32N, R1W
94.7	acres - Total	

TABLE A-1 (contd.)

Bargsten, Ernest F. and Bargsten, Beverly M.

Lands irrigated in 1964:

24	acres in NW¼ of NE¼ of Section 25, T32N, R2W
2.6	acres in SW¼ of NE¼ of Section 25, T32N, R2W
35	acres in NE¼ of NW¼ of Section 25, T32N, R2W
34	acres in NW¼ of NW¼ of Section 25, T32N, R2W
25	acres in SE¼ of NW¼ of Section 25, T32N, R2W
21	acres in SW¼ of NW¼ of Section 25, T32N, R2W
19	acres in NE¼ of NE¼ of Section 26, T32N, R2W
3.0	acres in NW¼ of NE¼ of Section 26, T32N, R2W
35	acres in SE¼ of NE¼ of Section 26, T32N, R2W
31	acres in SW¼ of NE¼ of Section 26, T32N, R2W
229.6	acres - Total

Beatie, Arthur H. and Beatie, Joy

Lands irrigated in 1964:

22	acres in SW¼ of NW¼ of Section 5, T30N, R3W
25	acres in NW¼ of NW¼ of Section 5, T30N, R3W
47	acres - Total

Lands idle in 1964:

0.4	acre in NE¼ of NW¼ of Section 5, T30N, R3W
9.6	acres in SE¼ of NW¼ of Section 5, T30N, R3W
4.8	acres in SW¼ of NW¼ of Section 5, T30N, R3W
5.0	acres in NW¼ of NW¼ of Section 5, T30N, R3W
19.8	acres - Total

Bingham, B. C.

Lands idle in 1964:

11 acres in NW¼ of NW¼ of Section 10, T31N, R3W

Bishop, Jack and Bishop, Thelma

Lands irrigated in 1964:

0.3 acre in SW¼ of NW¼ of Section 14, T31N, R3W

TABLE A-1 (contd.)

Blomquist, Theodore M. and Blomquist, Catharine A.

Lands irrigated in 1964:

2.2 acres in NE¼ of NW¼ of Section 14, T31N, R3W
23 acres in NW¼ of NW¼ of Section 14, T31N, R3W
9.8 acres in SW¼ of NW¼ of Section 14, T31N, R3W
35.0 acres - Total

Lands idle in 1964:

1.3 acres in NW¼ of NW¼ of Section 14, T31N, R3W

Bogue, H. E. and Bogue, Phyllis

Lands irrigated in 1964:

3.6 acres in SE¼ of SE¼ of Section 15, T32N, R1W
4.4 acres in SW¼ of SE¼ of Section 15, T32N, R1W
7.0 acres in NE¼ of NE¼ of Section 22, T32N, R1W
8.0 acres in NW¼ of NE¼ of Section 22, T32N, R1W
8.3 acres in NE¼ of NW¼ of Section 22, T32N, R1W
31.3 acres - Total

Boksa, Demeter and Boksa, Aurelia

Lands irrigated in 1964:

6.5 acres in SE¼ of NE¼ of Section 7, T32N, R1E

Brady, Jack and Brady, Ruth

Lands irrigated in 1964:

13 acres in SE¼ of NE¼ of Section 18, T32N, R1E
1.4 acres in NE¼ of NE¼ of Section 18, T32N, R1E
14.4 acres - Total

Lands idle in 1964:

12 acres in SE¼ of NE¼ of Section 18, T32N, R1E
3.0 acres in SW¼ of NE¼ of Section 18, T32N, R1E
15.0 acres - Total

TABLE A-1 (contd.)

Brewer, Lowell D. and Brewer, Vietta M.

Lands irrigated in 1964:

9.2	acres in NE¼ of SE¼ of Section 16, T32N, R1W
37	acres in NW¼ of SE¼ of Section 16, T32N, R1W
12	acres in SW¼ of SE¼ of Section 16, T32N, R1W
37	acres in NE¼ of SW¼ of Section 16, T32N, R1W
31	acres in NW¼ of SW¼ of Section 16, T32N, R1W
34	acres in SE¼ of SW¼ of Section 16, T32N, R1W
33	acres in SW¼ of SW¼ of Section 16, T32N, R1W
193.2	acres - Total

Bryant, Robert S. and Bryant, Louise (1/2 interest)
Bryant, William J. and Bryant, Dorothy E. (1/2 interest)

Lands irrigated in 1964:

25	acres in NE¼ of NW¼ of Section 5, T30N, R3W
9.6	acres in SE¼ of NW¼ of Section 5, T30N, R3W
0.8	acre in SW¼ of SE¼ of Section 32, T31N, R3W
4.8	acres in SE¼ of SW¼ of Section 32, T31N, R3W
40.2	acres - Total

Lands under construction in 1964:

7.6	acres in NE¼ of NW¼ of Section 32, T31N, R3W
13	acres in SW¼ of SE¼ of Section 32, T31N, R3W
21	acres in SE¼ of SW¼ of Section 32, T31N, R3W
41.6	acres - Total

Bullard, Harry E. and Bullard, Frona

Lands irrigated in 1964:

2.0 acres in NE¼ of SE¼ of Section 28, T32N, R1W

Carr, Pierre G. and Carr, Susan G.

Lands irrigated in 1964:

9.6	acres in NE¼ of NE¼ of Section 36, T32N, R1W
5.2	acres in SE¼ of NE¼ of Section 36, T32N, R1W
7.4	acres in SW¼ of NE¼ of Section 36, T32N, R1W
22.2	acres - Total

TABLE A-1 (contd.)

Carter, Paul L. and Carter, Juanita

Lands irrigated in 1964:

0.5 acre in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

Lands idle in 1964:

2.0 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

Chellis, Mary L.

Domestic use in NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 21, T32N, R1E

Cherta, John and Cherta, June

Lands idle in 1964:

4.2 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

Clark, William C. and Greer, Anita A.

Lands idle in 1964:

16 acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

Combs, Leslie and Combs, Ellen

Domestic use in NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 21, T32N, R1E

Covey, Myrtle Jurdy

Lands irrigated in 1964:

5.4 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W
2.2 acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W
9.0 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W
16.6 acres - Total

Lands idle in 1964:

5.4 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W

TABLE A-1 (contd.)

Covey, Harry N. and Covey, Colleen M.

Lands irrigated in 1964:

3.6 acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 23, T32N, R1W

Crowe Hereford Ranch

Lands irrigated in 1964:

13 acres in NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 26, T32N, R2W
15 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 26, T32N, R2W
4.8 acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 26, T32N, R2W
25 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 26, T32N, R2W
0.3 acre in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 26, T32N, R2W
20 acres in NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 26, T32N, R2W
5.2 acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 26, T32N, R2W
22 acres in SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 26, T32N, R2W
2.4 acres in NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 27, T32N, R2W
23 acres in SE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 27, T32N, R2W
17 acres in NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35, T32N, R2W
23 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35, T32N, R2W
15 acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35, T32N, R2W
17 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35, T32N, R2W
2.1 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 35, T32N, R2W
19 acres in NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 35, T32N, R2W
20 acres in SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 35, T32N, R2W
35 acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34, T32N, R2W
31 acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34, T32N, R2W
5.8 acres in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34, T32N, R2W
6.5 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 34, T32N, R2W
37 acres in NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 34, T32N, R2W
19 acres in NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 34, T32N, R2W
24 acres in SE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 34, T32N, R2W
34 acres in SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 34, T32N, R2W
16 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 34, T32N, R2W
1.0 acre in NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 34, T32N, R2W
40 acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 34, T32N, R2W
5.6 acres in SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 34, T32N, R2W
5.6 acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 33, T32N, R2W
12 acres in NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 33, T32N, R2W
6.8 acres in NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 33, T32N, R2W
4.2 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 2, T31N, R2W
17 acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 3, T31N, R2W
24 acres in NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 3, T31N, R2W
0.3 acre in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 3, T31N, R2W
43 acres in NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 3, T31N, R2W
6.0 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 3, T31N, R2W
4.0 acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 3, T31N, R2W
35 acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 3, T31N, R2W

TABLE A-1 (contd.)

Crowe Hereford Ranch (contd.)

Lands irrigated in 1964:

2.2	acres in NW¼ of SW¼ of Section	3, T31N, R2W
8.4	acres in SE¼ of NE¼ of Section	4, T31N, R2W
15	acres in NE¼ of SE¼ of Section	4, T31N, R2W
6.8	acres in SW¼ of NW¼ of Section	4, T31N, R2W
9.6	acres in SE¼ of NE¼ of Section	5, T31N, R2W
16	acres in NE¼ of SE¼ of Section	5, T31N, R2W
25	acres in NW¼ of SE¼ of Section	5, T31N, R2W
2.8	acres in SW¼ of SE¼ of Section	5, T31N, R2W
0.9	acre in NE¼ of SW¼ of Section	5, T31N, R2W
2.3	acres in SE¼ of SW¼ of Section	5, T31N, R2W
745.6	acres - Total	

Lands idle in 1964:

2.0	acres in NW¼ of NW¼ of Section	35, T32N, R2W
7.4	acres in SW¼ of NW¼ of Section	35, T32N, R2W
4.4	acres in NW¼ of SW¼ of Section	35, T32N, R2W
2.0	acres in SW¼ of NW¼ of Section	4, T31N, R2W
0.8	acre in SE¼ of NE¼ of Section	5, T31N, R2W
4.0	acres in SE¼ of SE¼ of Section	34, T32N, R2W
5.2	acres in NE¼ of NE¼ of Section	3, T31N, R2W
1.6	acres in NW¼ of NE¼ of Section	3, T31N, R2W
27.4	acres - Total	

Dargatz, Leo H. and Dargatz, Genieve R.

Lands irrigated in 1964:

11 acres in SW¼ of SE¼ of Section 5, T32N, R1E

Lands idle in 1964:

4.8 acres in SW¼ of SE¼ of Section 5, T32N, R1E

Dicker, C. M., Inc.

Lands irrigated in 1964:

1.0 acre in SE¼ of NW¼ of Section 18, T31N, R3W

Donohue, Paul and Donohue, Doris J.

Lands irrigated in 1964:

20 acres in SE¼ of NE¼ of Section 23, T32N, R1W

TABLE A-1 (contd.)

Dymesich, George J. and Dymesich, Sophie

Lands irrigated in 1964:

1.4 acres in SW¼ of SW¼ of Section 16, T32N, R1W
5.4 acres in NE¼ of NE¼ of Section 20, T32N, R1W
7.2 acres in NW¼ of NW¼ of Section 21, T32N, R1W
14.0 acres - Total

Lands idle in 1964:

7.0 acres in NW¼ of NW¼ of Section 21, T32N, R1W

Espinosa, Harold C. and Espinosa, Virginia L.

Lands irrigated in 1964:

0.6 acre in SE¼ of NE¼ of Section 13, T31N, R3W
7.0 acres in SW¼ of NE¼ of Section 13, T31N, R3W
4.4 acres in SE¼ of NW¼ of Section 13, T31N, R3W
0.1 acre in NE¼ of SE¼ of Section 13, T31N, R3W
10 acres in NW¼ of SE¼ of Section 13, T31N, R3W
16 acres in SW¼ of SE¼ of Section 13, T31N, R3W
38.1 acres - Total

Lands idle in 1964:

8.8 acres in NW¼ of SE¼ of Section 13, T31N, R3W
1.8 acres in SW¼ of NE¼ of Section 13, T31N, R3W
10.6 acres - Total

Lands under construction in 1964:

12 acres in NE¼ of SE¼ of Section 13, T31N, R3W
4.4 acres in NW¼ of SE¼ of Section 13, T31N, R3W
2.2 acres in SE¼ of SE¼ of Section 13, T31N, R3W
3.6 acres in SW¼ of SE¼ of Section 13, T31N, R3W
22.2 acres - Total

Faber, Darrell W. and Faber, Hazel E.

Lands irrigated in 1964:

10 acres in SE¼ of NW¼ of Section 26, T32N, R1E

TABLE A-1 (contd.)

Farrell, V. R. and Farrell, Henrietta

Lands irrigated in 1964:

1.2	acres in SW¼ of SW¼ of Section 12, T31N, R2W
14	acres in NE¼ of SW¼ of Section 11, T31N, R2W
25	acres in SE¼ of SW¼ of Section 11, T31N, R2W
17	acres in NW¼ of SE¼ of Section 11, T31N, R2W
16	acres in SW¼ of SE¼ of Section 11, T31N, R2W
1.6	acres in NE¼ of NW¼ of Section 14, T31N, R2W
74.8	acres - Total

Fitzpatrick, David P. and Fitzpatrick, Mildred

Lands irrigated in 1964:

33	acres in SW¼ of SE¼ of Section 20, T31N, R3W
10	acres in NW¼ of SE¼ of Section 20, T31N, R3W
0.8	acre in SE¼ of SW¼ of Section 20, T31N, R3W
43.8	acres - Total

Fraley, Harold L. and Fraley, Esther M.

Lands irrigated in 1964:

3.0	acres in SW¼ of NE¼ of Section 17, T31N, R3W
3.6	acres in NE¼ of SW¼ of Section 17, T31N, R3W
26	acres in NE¼ of NW¼ of Section 17, T31N, R3W
22	acres in SE¼ of NW¼ of Section 17, T31N, R3W
54.6	acres - Total

Lands idle in 1964:

13 acres in SE¼ of SW¼ of Section 17, T31N, R3W

Fraser, Thomas and Fraser, Morag

Lands under construction in 1964:

6.0 acres in NE¼ of SW¼ of Section 17, T31N, R3W

Frisbie, E. C.

Lands irrigated in 1964:

11	acres in SW¼ of NW¼ of Section 9, T31N, R3W
8.0	acres in NW¼ of NW¼ of Section 9, T31N, R3W
19.0	acres - Total

TABLE A-1 (contd.)

Gibson, Laine

Lands irrigated in 1964:

2.0 acres in NW¼ of SW¼ of Section 21, T32N, R1E

Gilbert, Roxie R.

Lands irrigated in 1964:

25	acres in NE¼ of SE¼ of Section 17, T32N, R1W
16	acres in NW¼ of SE¼ of Section 17, T32N, R1W
11	acres in SE¼ of SE¼ of Section 17, T32N, R1W
32	acres in SW¼ of SE¼ of Section 17, T32N, R1W
22	acres in NW¼ of NE¼ of Section 20, T32N, R1W
19	acres in NE¼ of NW¼ of Section 20, T32N, R1W
16	acres in NW¼ of NW¼ of Section 20, T32N, R1W
6.0	acres in SE¼ of NW¼ of Section 20, T32N, R1W
22	acres in SW¼ of NW¼ of Section 20, T32N, R1W
169.0	acres - Total

Glassford, Roy and Glassford, Olive E.

Lands irrigated in 1964:

0.6 acre in NE¼ of SW¼ of Section 20, T31N, R3W

Lands idle in 1964:

1.6 acres in NE¼ of SW¼ of Section 20, T31N, R3W

Grindlay, Helen V.

Lands irrigated in 1964:

10	acres in SE¼ of SE¼ of Section 5, T32N, R1E
0.4	acre in SW¼ of SE¼ of Section 5, T32N, R1E
9.8	acres in NE¼ of NE¼ of Section 8, T32N, R1E
12	acres in NW¼ of NE¼ of Section 8, T32N, R1E
1.6	acres in SW¼ of NE¼ of Section 8, T32N, R1E
4.0	acres in NW¼ of NE¼ of Section 9, T32N, R1E
5.4	acres in SW¼ of NE¼ of Section 9, T32N, R1E
0.4	acre in SE¼ of NE¼ of Section 9, T32N, R1E
43.6	acres - Total

TABLE A-1 (contd.)

Grindlay, Helen V. (contd.)

Lands idle in 1964:

22	acres in NE¼ of NE¼ of Section 8, T32N, R1E
14	acres in NE¼ of NE¼ of Section 9, T32N, R1E
17	acres in NW¼ of NE¼ of Section 9, T32N, R1E
0.6	acre in SW¼ of NE¼ of Section 9, T32N, R1E
0.4	acre in NE¼ of NW¼ of Section 9, T32N, R1E
2.0	acres in SE¼ of NW¼ of Section 9, T32N, R1E
56.0	acres - Total

Hall, Jura Lawrence

Lands irrigated in 1964:

14	acres in NE¼ of SW¼ of Section 13, T31N, R3W
9.6	acres in SE¼ of SW¼ of Section 13, T31N, R3W
14	acres in SW¼ of SW¼ of Section 13, T31N, R3W
17	acres in NW¼ of SW¼ of Section 13, T31N, R3W
54.6	acres - Total

Harris, John M. and Harris, Fanny B.

Lands irrigated in 1964:

1.0 acre in SW¼ of NW¼ of Section 17, T31N, R3W

Hawes, Melvin

Lands irrigated in 1964:

1.6	acres in SW¼ of NE¼ of Section 8, T30N, R3W
2.0	acres in NW¼ of NE¼ of Section 8, T30N, R3W
35	acres in NE¼ of NW¼ of Section 8, T30N, R3W
12	acres in SE¼ of NW¼ of Section 8, T30N, R3W
2.4	acres in SW¼ of NW¼ of Section 8, T30N, R3W
6.0	acres in NW¼ of NW¼ of Section 8, T30N, R3W
59.0	acres - Total

Lands under construction in 1964:

25	acres in SE¼ of NW¼ of Section 8, T30N, R3W
10	acres in SW¼ of NW¼ of Section 8, T30N, R3W
17	acres in NE¼ of SW¼ of Section 8, T30N, R3W
6.4	acres in NW¼ of SW¼ of Section 8, T30N, R3W
3.2	acres in SE¼ of SW¼ of Section 8, T30N, R3W
61.6	acres - Total

TABLE A-1 (contd.)

Hawes, Roy B.

Lands idle in 1964:

3.2	acres in NE¼ of SW¼ of Section 5, T30N, R3W
13	acres in SE¼ of SW¼ of Section 5, T30N, R3W
7.2	acres in SW¼ of SE¼ of Section 5, T30N, R3W
23.4	acres - Total

Lands under construction in 1964:

8.8	acres in NE¼ of SW¼ of Section 5, T30N, R3W
38	acres in NW¼ of SW¼ of Section 5, T30N, R3W
20	acres in SE¼ of SW¼ of Section 5, T30N, R3W
38	acres in SW¼ of SW¼ of Section 5, T30N, R3W
104.8	acres - Total

Herman, William F. and Herman, Helen E.

Lands irrigated in 1964:

19	acres in NE¼ of NW¼ of Section 29, T31N, R3W
7.2	acres in NW¼ of NW¼ of Section 29, T31N, R3W
26.2	acres - Total

Lands idle in 1964:

9.2	acres in NE¼ of NW¼ of Section 29, T31N, R3W
3.6	acres in NW¼ of NW¼ of Section 29, T31N, R3W
12.8	acres - Total

Hoffman, Margot

Lands irrigated in 1964:

2.5 acres in NE¼ of NW¼ of Section 29, T31N, R3W

Hufford, Albert F. and Hufford, Doris

Lands irrigated in 1964:

1.4	acres in SE¼ of NE¼ of Section 29, T31N, R3W
8.0	acres in SW¼ of NE¼ of Section 29, T31N, R3W
24	acres in NW¼ of NE¼ of Section 29, T31N, R3W
33.4	acres - Total

Hufford, Elmer

Lands irrigated in 1964:

20	acres in NW¼ of NE¼ of Section 34, T32N, R1W
29	acres in NE¼ of NW¼ of Section 34, T32N, R1W
24	acres in NW¼ of NW¼ of Section 34, T32N, R1W
25	acres in SE¼ of NW¼ of Section 34, T32N, R1W
21	acres in SW¼ of NW¼ of Section 34, T32N, R1W
11	acres in NE¼ of NE¼ of Section 7, T32N, R2E
12	acres in NW¼ of NW¼ of Section 8, T32N, R2E
142	acres - Total

Hufford, Jennie

Lands irrigated in 1964:

0.4 acre in NE¼ of SW¼ of Section 11, T31N, R2W

Hufford, Jesse D., Jr.

Lands irrigated in 1964:

32	acres in SE¼ of SE¼ of Section 14, T31N, R3W
20	acres in SW¼ of SE¼ of Section 14, T31N, R3W
9.2	acres in NE¼ of SW¼ of Section 14, T31N, R3W
25	acres in SE¼ of NW¼ of Section 14, T31N, R3W
7.2	acres in SW¼ of NW¼ of Section 14, T31N, R3W
93.4	acres - Total

Hufford, Jesse, Estate of

Lands irrigated in 1964:

18	acres in NW¼ of SW¼ of Section 19, T32N, R1W
31	acres in SW¼ of SW¼ of Section 19, T32N, R1W
9.6	acres in NE¼ of NW¼ of Section 30, T32N, R1W
37	acres in NW¼ of NW¼ of Section 30, T32N, R1W
3.6	acres in SW¼ of NW¼ of Section 30, T32N, R1W
9.4	acres in NE¼ of SE¼ of Section 24, T32N, R2W
30	acres in SE¼ of SE¼ of Section 24, T32N, R2W
20	acres in SW¼ of SE¼ of Section 24, T32N, R2W
1.4	acres in SE¼ of SW¼ of Section 24, T32N, R2W
34	acres in NE¼ of NE¼ of Section 25, T32N, R2W
3.4	acres in NW¼ of NE¼ of Section 25, T32N, R2W
33	acres in SE¼ of NE¼ of Section 25, T32N, R2W
16	acres in SW¼ of NE¼ of Section 25, T32N, R2W
1.2	acres in NE¼ of SE¼ of Section 25, T32N, R2W
11	acres in NW¼ of SE¼ of Section 25, T32N, R2W
7.6	acres in NE¼ of SW¼ of Section 25, T32N, R2W
266.2	acres - Total

Hufford, Jesse, Estate of (contd.)

Lands idle in 1964:

5.0	acres in NE¼ of SE¼ of Section 25, T32N, R2W
1.8	acres in NW¼ of SE¼ of Section 25, T32N, R2W
6.8	acres - Total

Hunt, W. H., Estate Company

Lands irrigated in 1964:

20	acres in NW¼ of NW¼ of Section 15, T31N, R2W
13	acres in NE¼ of NW¼ of Section 15, T31N, R2W
11	acres in NW¼ of NE¼ of Section 15, T31N, R2W
4.2	acres in NE¼ of NE¼ of Section 15, T31N, R2W
2.5	acres in SW¼ of SE¼ of Section 10, T31N, R2W
36	acres in SE¼ of SE¼ of Section 10, T31N, R2W
12	acres in NW¼ of NW¼ of Section 14, T31N, R2W
9.0	acres in SE¼ of SW¼ of Section 11, T31N, R2W
35	acres in SW¼ of SW¼ of Section 11, T31N, R2W
0.4	acre in NE¼ of SW¼ of Section 11, T31N, R2W
143.1	acres - Total

Hutchins, William L. and Hutchins, Mary Jane

Lands idle in 1964:

1.0	acre in SW¼ of NE¼ of Section 32, T33N, R1E
2.0	acres in SE¼ of NE¼ of Section 32, T33N, R1E
3.0	acres - Total

Johnson, J. George and Johnson, Ruth J.

Lands idle in 1964:

1.0 acre in NE¼ of SW¼ of Section 20, T31N, R3W

Jones, Ellis T.

Lands irrigated in 1964:

12	acres in NE¼ of SE¼ of Section 11, T31N, R2W
2.6	acres in SE¼ of SE¼ of Section 11, T31N, R2W
14.6	acres - Total

TABLE A-1 (contd.)

Jones, Jesse C.

Lands irrigated in 1964:

2.8 acres in SW¼ of SE¼ of Section 11, T31N, R2W
3.5 acres in NW¼ of SE¼ of Section 11, T31N, R2W
4.2 acres in NE¼ of SE¼ of Section 11, T31N, R2W
2.9 acres in SE¼ of SE¼ of Section 11, T31N, R2W
13.4 acres - Total

Jungsten, Henry J. and Jungsten, E.

Lands irrigated in 1964:

4.6 acres in NE¼ of SW¼ of Section 23, T32N, R1W

Junkans, Elmer W. and Junkans, Verne

Lands irrigated in 1964:

5.6 acres in NW¼ of NE¼ of Section 10, T31N, R3W
35 acres in NE¼ of NW¼ of Section 10, T31N, R3W
29 acres in SE¼ of NW¼ of Section 10, T31N, R3W
69.6 acres - Total

Knight, Remi C.

Lands irrigated in 1964:

14 acres in NW¼ of NE¼ of Section 7, T32N, R2E
16 acres in SW¼ of NE¼ of Section 7, T32N, R2E
1.0 acre in NE¼ of NW¼ of Section 7, T32N, R2E
30 acres in SE¼ of NW¼ of Section 7, T32N, R2E
5.8 acres in NW¼ of SE¼ of Section 7, T32N, R2E
9.8 acres in NE¼ of SW¼ of Section 7, T32N, R2E
76.6 acres - Total

Lands idle in 1964:

4.2 acres in SW¼ of NE¼ of Section 7, T32N, R2E

Power generation in SW¼ of NE¼ of Section 7, T32N, R2E

Domestic use in SW¼ of NW¼ of Section 18, T32N, R1E, and
NW¼ of SW¼ of Section 18, T32N, R1E

Koehler, Roderick

Lands irrigated in 1964:

6.6	acres in NE¼ of SW¼ of Section 15, T32N, R1W
6.8	acres in NW¼ of SW¼ of Section 15, T32N, R1W
2.0	acres in SW¼ of SW¼ of Section 15, T32N, R1W
0.3	acre in NE¼ of SE¼ of Section 16, T32N, R1W
19	acres in SE¼ of SE¼ of Section 16, T32N, R1W
8.4	acres in SW¼ of SE¼ of Section 16, T32N, R1W
43.1	acres - Total

Lansing, Lucille

Lands irrigated in 1964:

25	acres in SE¼ of NE¼ of Section 35, T32N, R1W
18	acres in SW¼ of NE¼ of Section 35, T32N, R1W
22	acres in SE¼ of NW¼ of Section 35, T32N, R1W
5.3	acres in SW¼ of NW¼ of Section 35, T32N, R1W
1.6	acres in NE¼ of SE¼ of Section 35, T32N, R1W
10	acres in SE¼ of NW¼ of Section 36, T32N, R1W
32	acres in SW¼ of NW¼ of Section 36, T32N, R1W
6.6	acres in NE¼ of SW¼ of Section 36, T32N, R1W
34	acres in NW¼ of SW¼ of Section 36, T32N, R1W
154.5	acres - Total

Lands idle in 1964:

9.4	acres in SE¼ of NE¼ of Section 35, T32N, R1W
0.4	acre in SW¼ of NE¼ of Section 35, T32N, R1W
3.6	acres in NE¼ of SE¼ of Section 35, T32N, R1W
13.4	acres - Total

LaTour State Forest

Domestic use in SE¼ of SE¼ of Section 1, T32N, R2E

Leggett, Howard M. and Leggett, Gladys A.

Lands irrigated in 1964:

32	acres in SE¼ of NE¼ of Section 8, T31N, R3W
16	acres in SW¼ of NE¼ of Section 8, T31N, R3W
8.8	acres in NW¼ of SE¼ of Section 8, T31N, R3W
56.8	acres - Total

Leggett, Howard M. and Leggett, Gladys A. (contd.)

Lands idle in 1964:

32	acres in NE¼ of SE¼ of Section 8, T31N, R3W
31	acres in NW¼ of SE¼ of Section 8, T31N, R3W
18	acres in SE¼ of SE¼ of Section 8, T31N, R3W
36	acres in SW¼ of SE¼ of Section 8, T31N, R3W
2.8	acres in SE¼ of SW¼ of Section 8, T31N, R3W
119.8	acres - Total

Lynes, Ronald E. and Lynes, Vivian F.

Lands irrigated in 1964:

19	acres in SW¼ of NE¼ of Section 14, T31N, R3W
0.1	acre in NW¼ of NE¼ of Section 14, T31N, R3W
1.6	acres in NE¼ of SE¼ of Section 14, T31N, R3W
5.6	acres in NW¼ of SE¼ of Section 14, T31N, R3W
6.8	acres in SE¼ of NW¼ of Section 14, T31N, R3W
33.1	acres - Total

Lands idle in 1964:

6.0 acres in NE¼ of SE¼ of Section 14, T31N, R3W

MacMillan, Emma B.

Lands irrigated in 1964:

1.5 acres in SW¼ of SE¼ of Section 28, T33N, R1E

Maynard, R. and Maynard, E. D.

Lands irrigated in 1964:

4.4	acres in SE¼ of NE¼ of Section 19, T31N, R3W
20	acres in NE¼ of SE¼ of Section 19, T31N, R3W
24.4	acres - Total

Lands idle in 1964:

24 acres in SE¼ of NE¼ of Section 19, T31N, R3W

McKee, Charles N. and McKee, Jane E.

Lands irrigated in 1964:

0.4 acre in NE¼ of SW¼ of Section 20, T31N,R3W

McKee, Charles N. and McKee, Jane E. (contd.)

Lands idle in 1964:

4.6 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

McTimmonds, Guy W. and McTimmonds, Pat L.

Lands irrigated in 1964:

25	acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21, T32N, R1E
12	acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21, T32N, R1E
37	acres - Total

Miller, C. Elbert, Weller, Edward F. and Weller, Lucille M.

Lands irrigated in 1964:

16	acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 22, T32N, R1E
8.8	acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 22, T32N, R1E
24.8	acres - Total

Mix, Robert H.

Lands irrigated in 1964:

2.6 acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 21, T32N, R1E

Morelli, Virginia Lee

Lands irrigated in 1964:

13	acres in SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 28, T32N, R1E
4.8	acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 28, T32N, R1E
17	acres in SE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 30, T32N, R1E
15	acres in SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 30, T32N, R1E
28	acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 31, T32N, R1E
3.8	acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 31, T32N, R1E
81.6	acres - Total

Lands idle in 1964:

6.6	acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 28, T32N, R1E
1.6	acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 30, T32N, R1E
0.5	acre in SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 30, T32N, R1E
8.7	acres - Total

Morse, Alvin and Morse, Donna

Lands idle in 1964:

10 acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

Murphy, Richard M.

Lands irrigated in 1964:

21	acres in NE¼ of NW¼ of Section 28,	T33N, R1E
18	acres in NW¼ of NW¼ of Section 28,	T33N, R1E
28	acres in SE¼ of NW¼ of Section 28,	T33N, R1E
32	acres in SW¼ of NW¼ of Section 28,	T33N, R1E
26	acres in NE¼ of SW¼ of Section 28,	T33N, R1E
40	acres in NW¼ of SW¼ of Section 28,	T33N, R1E
9.2	acres in SW¼ of SW¼ of Section 28,	T33N, R1E
6.0	acres in NE¼ of NE¼ of Section 29,	T33N, R1E
30	acres in SE¼ of NE¼ of Section 29,	T33N, R1E
9.6	acres in SW¼ of NE¼ of Section 29,	T33N, R1E
11	acres in NW¼ of SE¼ of Section 29,	T33N, R1E
39	acres in NE¼ of SE¼ of Section 29,	T33N, R1E
269.8	acres - Total	

Murphy, Tal E. and Murphy, Marian L.

Lands irrigated in 1964:

2.2 acres in SE¼ of SW¼ of Section 29, T31N, R3W

Neely, Laurence C.

Lands irrigated in 1964:

0.1	acre in NW¼ of SW¼ of Section 8,	T32N, R1E
3.0	acres in NW¼ of NE¼ of Section 17,	T32N, R1E
6.2	acres in NE¼ of NW¼ of Section 17,	T32N, R1E
12	acres in SE¼ of NW¼ of Section 17,	T32N, R1E
4.8	acres in NE¼ of SW¼ of Section 17,	T32N, R1E
26.1	acres - Total	

Lands idle in 1964:

1.9	acres in NW¼ of NE¼ of Section 17,	T32N, R1E
4.6	acres in SW¼ of NE¼ of Section 17,	T32N, R1E
1.2	acres in NE¼ of NW¼ of Section 17,	T32N, R1E
7.0	acres in SE¼ of NW¼ of Section 17,	T32N, R1E
0.6	acre in NE¼ of SW¼ of Section 17,	T32N, R1E
15.3	acres - Total	

North Valley Title and Escrow Company

Lands irrigated in 1964:

5.0 acres in NE¼ of NW¼ of Section 29, T31N, R3W

Otten, Alex J. and Otten, Esther E.

Lands irrigated in 1964:

19	acres in NE¼ of NE¼ of Section 8, T31N, R3W
4.0	acres in NW¼ of NE¼ of Section 8, T31N, R3W
23.0	acres - Total

Owbridge, June M.

Lands irrigated in 1964:

13.6	acres in NE¼ of NW¼ of Section 8, T32N, R1E
1.3	acres in SE¼ of NW¼ of Section 8, T32N, R1E
4.3	acres in SW¼ of NW¼ of Section 8, T32N, R1E
19.2	acres - Total

Lands idle in 1964:

7.2 acres in NE¼ of NW¼ of Section 8, T32N, R1E

Pacific Gas and Electric Company

Domestic use in NW¼ of NW¼ of Section 33, T33N, R1E

Lands irrigated in 1964:

5.4	acres in NE¼ of SE¼ of Section 23, T32N, R1W
0.5	acre in NW¼ of SW¼ of Section 24, T32N, R1W
5.9	acres - Total

Power generation in Kilarc Powerhouse within NW¼ of NW¼ of Section 33, T33N, R1E, and in South Cow Creek Powerhouse within NW¼ of SE¼ of Section 6, T31N, R1W

Parker, James and Parker, M. E.

Lands irrigated in 1964:

4.4	acres in SW¼ of NE¼ of Section 20, T32N, R1W
8.8	acres in SE¼ of NW¼ of Section 20, T32N, R1W
4.4	acres in SW¼ of NW¼ of Section 20, T32N, R1W
29	acres in NE¼ of SW¼ of Section 20, T32N, R1W
30	acres in NW¼ of SW¼ of Section 20, T32N, R1W
1.6	acres in SE¼ of SW¼ of Section 20, T32N, R1W
9.2	acres in SW¼ of SW¼ of Section 20, T32N, R1W
87.4	acres - Total

TABLE A-1 (contd.)

Parker, James and Parker, M. E. (contd.)

Lands idle in 1964:

4.8	acres	in SW¼ of NE¼ of Section 20, T32N, R1W
3.0	acres	in SE¼ of NW¼ of Section 20, T32N, R1W
7.8	acres	- Total

Pearson, Glenn

Lands irrigated in 1964:

0.4	acre	in SE¼ of SE¼ of Section 29, T31N, R3W
18	acres	in SW¼ of SE¼ of Section 29, T31N, R3W
10	acres	in NE¼ of NE¼ of Section 32, T31N, R3W
6.4	acres	in SE¼ of NE¼ of Section 32, T31N, R3W
40	acres	in SW¼ of NE¼ of Section 32, T31N, R3W
40	acres	in NW¼ of NE¼ of Section 32, T31N, R3W
0.8	acre	in NE¼ of SE¼ of Section 32, T31N, R3W
38	acres	in NW¼ of SE¼ of Section 32, T31N, R3W
22	acres	in NE¼ of SW¼ of Section 32, T31N, R3W
17	acres	in NE¼ of NW¼ of Section 32, T31N, R3W
17	acres	in SE¼ of NW¼ of Section 32, T31N, R3W
209.6	acres	- Total

Peterson, Charlie E. and Peterson, Corinne J.

Lands irrigated in 1964:

11	acres	in SW¼ of SW¼ of Section 11, T32N, R1W
5.2	acres	in SE¼ of SW¼ of Section 11, T32N, R1W
4.4	acres	in SE¼ of SE¼ of Section 11, T32N, R1W
29	acres	in NW¼ of NW¼ of Section 14, T32N, R1W
11	acres	in NE¼ of NW¼ of Section 14, T32N, R1W
0.1	acre	in NE¼ of NE¼ of Section 14, T32N, R1W
60.7	acres	- Total

Lands under construction in 1964:

10	acres	in SE¼ of NW¼ of Section 14, T32N, R1W
14	acres	in SW¼ of NW¼ of Section 14, T32N, R1W
24	acres	- Total

Plath, William F. and Plath, Donna C.

Domestic use in SW¼ of NW¼ of Section 23, T32N, R1W

TABLE A-1 (contd.)

Powell, Byron T. and Powell, Elma B.

Lands irrigated in 1964:

1.7 acres in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 13, T32N, R1W

Reimer, George and Reimer, Dorothy

Lands irrigated in 1964:

30	acres in NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21,	T32N, R1E
3.4	acres in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21,	T32N, R1E
20	acres in NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 21,	T32N, R1E
7.0	acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 21,	T32N, R1E
60.4	acres - Total	

Lands idle in 1964:

2.0	acres in NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21,	T32N, R1E
1.8	acres in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 21,	T32N, R1E
3.8	acres - Total	

Roberts, David E.

Domestic use in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 13, T31N, R3W

Robinson, James W. and Robinson, Willie Ola

Lands idle in 1964:

2.5	acres in NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20,	T31N, R3W
2.5	acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20,	T31N, R3W
5.0	acres - Total	

Roesner, Elmer W.

Lands irrigated in 1964:

2.0 acres in SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T31N, R3W

Roland, Henry E. and Roland, Syble C.

Lands irrigated in 1964:

4.0	acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34,	T32N, R1W
10	acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34,	T32N, R1W
25	acres in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 34,	T32N, R1W
0.2	acre in NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35,	T32N, R1W
5.0	acres in SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 35,	T32N, R1W
44.2	acres - Total	

TABLE A-1 (contd.)

Rose, Ellis E. and Rose, Yoko

Lands irrigated in 1964:

1.0 acre in NW¼ of NE¼ of Section 36, T32N, R1W
1.4 acres in SW¼ of NE¼ of Section 36, T32N, R1W
2.4 acres- Total

Rynd, Donald E. and Rynd, Shelley

Lands irrigated in 1964:

4.0 acres in NW¼ of SW¼ of Section 21, T32N, R1E

Schmitt, James W. and Schmitt, Shirley J.

Lands irrigated in 1964:

0.8 acre in SE¼ of SW¼ of Section 16, T32N, R1W
4.9 acres in NE¼ of NE¼ of Section 20, T32N, R1W
2.0 acres in NE¼ of NW¼ of Section 21, T32N, R1W
7.7 acres - Total

Lands idle in 1964:

0.6 acre in NE¼ of NW¼ of Section 21, T32N, R1W

Schulz, Walter P. and Schulz, Mary V.

Lands idle in 1964:

5.2 acres in SW¼ of SW¼ of Section 4, T31N, R3W
1.2 acres in SW¼ of NW¼ of Section 9, T31N, R3W
25 acres in NW¼ of NW¼ of Section 9, T31N, R3W
31.4 acres - Total

Scott Lumber Company

Lands idle in 1964:

3.2 acres in NE¼ of NE¼ of Section 28, T32N, R2E
5.2 acres in SE¼ of NE¼ of Section 28, T32N, R2E
8.4 acres - Total

TABLE A-1 (contd.)

Scott, C. Emlen

Lands irrigated in 1964:

7.4 acres in SE¼ of SW¼ of Section 33, T33N, R1E

Scott, Earl F. and Scott, Elinor

Domestic use in NE¼ of SW¼ and NW¼ of SW¼ of Section 21, T32N, R1E

Shufelberger, Vern and Shufelberger, Rose

Lands irrigated in 1964:

25	acres in SE¼ of NE¼ of Section 9, T31N, R3W
9.6	acres in SW¼ of NE¼ of Section 9, T31N, R3W
26	acres in SE¼ of NW¼ of Section 9, T31N, R3W
22	acres in SW¼ of NW¼ of Section 9, T31N, R3W
82.6	acres - Total

Lands idle in 1964:

15	acres in SW¼ of NE¼ of Section 9, T31N, R3W
1.0	acre in SE¼ of NW¼ of Section 9, T31N, R3W
16.0	acres - Total

Skipworth

Lands idle in 1964:

0.8	acre in NE¼ of NE¼ of Section 32, T33N, R1E
0.3	acre in NW¼ of NE¼ of Section 32, T33N, R1E
0.3	acre in SW¼ of NE¼ of Section 32, T33N, R1E
0.8	acre in SE¼ of NE¼ of Section 32, T33N, R1E
2.2	acres - Total

Smith, Donald V.

Lands irrigated in 1964:

4.0 acres in SE¼ of NW¼ of Section 36, T32N, R1W

Staiger, J. Dana and Staiger, Bon

Lands idle in 1964:

2.0	acres in NE¼ of NE¼ of Section 33, T32N, R1W
4.6	acres in NW¼ of NE¼ of Section 33, T32N, R1W
19	acres in SE¼ of NE¼ of Section 33, T32N, R1W
8.0	acres in SW¼ of NE¼ of Section 33, T32N, R1W
33.6	acres - Total

Stone, F. C., Stone, Geneva E.
Stone, Charles W. and Stone, Clara E.

Lands irrigated in 1964:

11 acres in NW¼ of SE¼ of Section 20, T31N, R3W
0.4 acre in NE¼ of SW¼ of Section 20, T31N, R3W
11.4 acres - Total

Swoboda, John F. and Swoboda, Lucille

Lands irrigated in 1964:

0.4 acre in NW¼ of NE¼ of Section 29, T31N, R3W
0.8 acre in NE¼ of NW¼ of Section 29, T31N, R3W
12 acres in SE¼ of NW¼ of Section 29, T31N, R3W
13.2 acres - Total

Lands idle in 1964:

11 acres in SE¼ of NW¼ of Section 29, T31N, R3W

Swoboda, Lawrence J. and Swoboda, Helen

Lands irrigated in 1964:

14 acres in SW¼ of NE¼ of Section 29, T31N, R3W

Tippin, Jerry W. and Tippin, Gloria

Lands irrigated in 1964:

2.5 acres in NE¼ of NW¼ of Section 29, T31N, R3W

Turk, Ellen H. and Cook, Roger D.

Lands irrigated in 1964:

4.2 acres in SE¼ of SW¼ of Section 17, T32N, R1E

TABLE A-1 (contd.)

Tuttle, Carl F. Jr., and Tuttle, Vivian W.

Lands irrigated in 1964:

38	acres	in NE¼ of NE¼ of Section 9, T31N, R3W
2.0	acres	in SE¼ of NE¼ of Section 9, T31N, R3W
4.0	acres	in SW¼ of NE¼ of Section 9, T31N, R3W
30	acres	in NW¼ of NE¼ of Section 9, T31N, R3W
74.0	acres	- Total

Lands idle in 1964:

0.8	acre	in NE¼ of NE¼ of Section 9, T31N, R3W
4.4	acres	in SE¼ of NE¼ of Section 9, T31N, R3W
10	acres	in SW¼ of NE¼ of Section 9, T31N, R3W
20	acres	in NE¼ of NW¼ of Section 9, T31N, R3W
8.4	acres	in SE¼ of NW¼ of Section 9, T31N, R3W
43.6	acres	- Total

Wagoner, W. G.

Lands irrigated in 1964:

1.1	acres	in NE¼ of SW¼ of Section 6, T31N, R1W
1.2	acres	in NW¼ of SW¼ of Section 6, T31N, R1W
0.1	acre	in SE¼ of SW¼ of Section 6, T31N, R1W
2.4	acres	- Total

Lands idle in 1964:

1.3	acres	in NW¼ of SW¼ of Section 6, T31N, R1W

Walker, Archie D. Jr., et al. (c/o Shasta Forests Company)

Lands irrigated in 1964:

11	acres	in SW¼ of NE¼ of Section 15, T32N, R1E
4.0	acres	in NW¼ of NW¼ of Section 15, T32N, R1E
23	acres	in SE¼ of NW¼ of Section 15, T32N, R1E
26	acres	in SW¼ of NW¼ of Section 15, T32N, R1E
0.3	acre	in NW¼ of SE¼ of Section 15, T32N, R1E
10	acres	in SE¼ of SE¼ of Section 15, T32N, R1E
15	acres	in NE¼ of SW¼ of Section 15, T32N, R1E
4.6	acres	in NW¼ of SW¼ of Section 15, T32N, R1E
1.2	acres	in NE¼ of NE¼ of Section 16, T32N, R1E
2.4	acres	in SE¼ of NE¼ of Section 16, T32N, R1E
0.3	acre	in NW¼ of NW¼ of Section 22, T32N, R1E
15	acres	in SE¼ of NW¼ of Section 22, T32N, R1E
24	acres	in SW¼ of NW¼ of Section 22, T32N, R1E
2.8	acres	in NE¼ of SW¼ of Section 22, T32N, R1E
0.8	acre	in SW¼ of SW¼ of Section 29, T32N, R1E
140.4	acres	- Total

TABLE A-1 (contd.)

Walker, Archie D. Jr., et al. (c/o Shasta Forests Company) (contd.)

Lands idle in 1964:

0.2 acre in NE¼ of NW¼ of Section 15, T32N, R1E
2.4 acres in SE¼ of NW¼ of Section 15, T32N, R1E
2.6 acres - Total

Lands under construction in 1964:

1.2 acres in NW¼ of NW¼ of Section 22, T32N, R1E
15 acres in SE¼ of NW¼ of Section 22, T32N, R1E
3.1 acres in SW¼ of NW¼ of Section 22, T32N, R1E
19.3 acres - Total

Weir, Frank B. and Weir, Betty C.

Lands irrigated in 1964:

3.5 acres in SE¼ of SE¼ of Section 20, T32N, R1E

Lands idle in 1964:

3.5 acres in SE¼ of SE¼ of Section 20, T32N, R1E

Welch, Alvador

Lands irrigated in 1964:

2.8 acres in NE¼ of SE¼ of Section 19, T32N, R1W
14 acres in NW¼ of SE¼ of Section 19, T32N, R1W
2.6 acres in SE¼ of SE¼ of Section 19, T32N, R1W
15 acres in SW¼ of SE¼ of Section 19, T32N, R1W
11 acres in NE¼ of SW¼ of Section 19, T32N, R1W
31 acres in SE¼ of SW¼ of Section 19, T32N, R1W
76.4 acres - Total

Wetzel, Wesley and Wetzel, Maxine Thompson

Lands irrigated in 1964:

15 acres in NE¼ of NW¼ of Section 14, T31N, R3W

Whitmore State Forestry Station

Domestic use in SW¼ of NW¼ of Section 17, T32N, R1E

Wiley, Marvin L.

Lands irrigated in 1964:

5.9	acres in SW¼ of SE¼ of Section 20, T32N, R1E
12	acres in SE¼ of SE¼ of Section 20, T32N, R1E
17.9	acres - Total

Williams, Wallace B.

Lands irrigated in 1964:

1.2	acres in SE¼ of NE¼ of Section 32, T33N, R1E
11	acres in SW¼ of NE¼ of Section 32, T33N, R1E
12	acres in NW¼ of SE¼ of Section 32, T33N, R1E
28	acres in NW¼ of SW¼ of Section 5, T32N, R1E
6.1	acres in SW¼ of SW¼ of Section 5, T32N, R1E
22	acres in NE¼ of SE¼ of Section 6, T32N, R1E
15	acres in SE¼ of SE¼ of Section 6, T32N, R1E
95.3	acres - Total

Lands idle in 1964:

1.6	acres in NW¼ of SE¼ of Section 32, T33N, R1E
6.2	acres in SW¼ of SW¼ of Section 5, T32N, R1E
4.8	acres in SE¼ of SE¼ of Section 6, T32N, R1E
12.6	acres - Total

Lands under construction in 1964:

5.2	acres in NW¼ of SW¼ of Section 5, T32N, R1E
0.4	acre in SW¼ of SW¼ of Section 5, T32N, R1E
5.6	acres - Total

Worden, Gilbert T. and Worden, Betty J.

Lands irrigated in 1964:

5.2	acres in NE¼ of NE¼ of Section 24, T32N, R1E
3.6	acres in NW¼ of NE¼ of Section 24, T32N, R1E
17	acres in SW¼ of NE¼ of Section 24, T32N, R1E
2.8	acres in NE¼ of NW¼ of Section 24, T32N, R1E
3.1	acres in NW¼ of NW¼ of Section 24, T32N, R1E
33	acres in SE¼ of NW¼ of Section 24, T32N, R1E
8.2	acres in SW¼ of NW¼ of Section 24, T32N, R1E
72.9	acres - Total

Lands idle in 1964:

1.9 acres in SW¼ of NE¼ of Section 24, T32N, R1E

Power generation in SW¼ of NE¼ of Section 24, T32N, R1E

TABLE A-1 (contd.)

Wurst, Leroy G.

Lands irrigated in 1964:

10	acres in SE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 10, T32N, R1W
9.6	acres in SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 10, T32N, R1W
33	acres in NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 15, T32N, R1W
35	acres in NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 15, T32N, R1W
8.4	acres in SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 15, T32N, R1W
20	acres in SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 15, T32N, R1W
116.0	acres - Total

Zeis, Melvin

Lands idle in 1964:

4.9 acres in SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W

TABLE A-2

LOCATION OF POINTS OF DIVERSION

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Latour Springs	1	Lot 10, Sec. 1 T32N, R2E	SW Corner, Sec. 1 T32N, R2E	N 31° E	5,300
		NE¼ SE¼, Sec. 3 T32N, R2E	SE Corner, Sec. 3 T32N, R2E	N 20° W	1,620
		SE¼ SE¼, Sec. 32 T33N, R2E	SE Corner, Sec. 32 T33N, R2E	N 16° W	1,310
No. One Road Pumps	2	SW¼ NW¼, Sec. 20 T33N, R2E	NW Corner, Sec. 20 T33N, R2E	S 38° E	1,800
		NW¼ NW¼, Sec. 24 T33N, R1E	NW Corner, Sec. 24 T33N, R1E	S 53° E	1,220
Kilarc Powerhouse Ditch	3	SW¼ NE¼, Sec. 25 T33N, R1E	N¼ Corner, Sec. 25 T33N, R1E	S 10° E	1,690
Canyon Creek Ditch	4	SW¼ SW¼, Sec. 24 T33N, R1E	SW Corner, Sec. 24 T33N, R1E	N 10° E	730
		NE¼ SE¼, Sec. 23 T33N, R1E	E¼ Corner, Sec. 23 T33N, R1E	S 36° W	1,020
Murphy Ditch	5	SW¼ SE¼, Sec. 23 T33N, R1E	S¼ Corner, Sec. 23 T33N, R1E	N 83° E	1,160
Grindlay-Williams Ditch	6	NW¼ SW¼, Sec. 27 T33N, R1E	W¼ Corner, Sec. 27 T33N, R1E	S 27° E	540
MacMillan Spring	7	SW¼ SE¼, Sec. 28 T33N, R1E	SE Corner, Sec. 28 T33N, R1E	N 82° W	1,550
Murphy Upper Springs	8	SW¼ SW¼, Sec. 21 T33N, R1E	SW Corner, Sec. 21 T33N, R1E	N 53° E	480
Murphy Lower Springs	9	SW¼ NE¼, Sec. 28 T33N, R1E	N¼ Corner, Sec. 28 T33N, R1E	S 5° E	1,970
		NE¼ NW¼, Sec. 28 T33N, R1E	N¼ Corner, Sec. 28 T33N, R1E	S 4° W	1,250

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Murphy Lower Springs (contd.)	9	NW¼ NW¼, Sec. 28 T33N, R1E	NW Corner, Sec. 28 T33N, R1E	S 84° E	960
Kilarc Domestic Spring	10	SE¼ NW¼, Sec. 33 T33N, R1E	N¼ Corner, Sec. 33 T33N, R1E	S 23° W	1,900
Williams Lower Ditch	11	NW¼ NE¼, Sec. 32 T33N, R1E	NE Corner, Sec. 32 T33N, R1E	S 50° W	1,880
Grindlay Upper Glendenning Creek Ditch	12	NE¼ NW¼, Sec. 10 T32N, R1E	N¼ Corner, Sec. 10 T32N, R1E	Due South	1,140
Grindlay Lower Glendenning Creek Ditch	13	NE¼ NE¼, Sec. 9 T32N, R1E	E¼ Corner, Sec. 9 T32N, R1E	N 50° W	1,750
Grindlay South Glendenning Creek Ditch	14	NE¼ NE¼, Sec. 9 T32N, R1E	E¼ Corner, Sec. 9 T32N, R1E	N 50° W	1,750
Scott Spring	15	SE¼ SW¼, Sec. 33 T33N, R1E	S¼ Corner, Sec. 33 T33N, R1E	N 51° W	1,050
Neely Glendenning Creek Ditch	16	NW¼ SW¼, Sec. 9 T32N, R1E	W¼ Corner, Sec. 9 T32N, R1E	S 23° E	1,170
Neely Spring	17	NW¼ NE¼, Sec. 17 T32N, R1E	N¼ Corner, Sec. 17 T32N, R1E	S 31° E	870
Owbridge East Ditch	18	SE¼ NW¼, Sec. 8 T32N, R1E	N¼ Corner, Sec. 8 T32N, R1E	Due South	2,160
Dargatz Spring	19	NW¼ SE¼, Sec. 5 T32N, R1E	S¼ Corner, Sec. 5 T32N, R1E	N 23° E	1,760
Owbridge Upper East Side Ditch	20	SE¼ SW¼, Sec. 5 T32N, R1E	S¼ Corner, Sec. 5 T32N, R1E	N 10° W	230
Owbridge Upper West Side Ditch	21	NE¼ NW¼, Sec. 8 T32N, R1E	N¼ Corner, Sec. 8 T32N, R1E	S 71° W	200
Owbridge Lower East Side Ditch	22	NE¼ NW¼, Sec. 8 T32N, R1E	N¼ Corner, Sec. 8 T32N, R1E	S 46° W	1,720

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Owbridge Lower West Side Ditch	23	NE¼ NW¼, Sec. 8 T32N, R1E	N¼ Corner, Sec. 8 T32N,R1E	S 46° W	1,750
Atkins Ash Creek Ditch	24	SW¼ NW¼, Sec. 8 T32N, R1E	W¼ Corner, Sec. 8 T32N,R1E	N 60° E	910
Atkins Upper Spring	25	NE¼ SW¼, Sec. 7 T32N, R1E	SW Corner, Sec. 7 T32N,R1E	N 60° E	3,300
Atkins Lower Spring	26	NE¼ SW¼, Sec. 7 T32N, R1E	NW Corner, Sec. 7 T32N, R1E	S 39° E	3,570
Atkins Domestic Spring	27	Lot 4, Sec. 7 T32N, R1E	SW Corner, Sec. 7 T32N, R1E	N 40° E	670
Brown-Grover Ditch	28	Lot 3, Sec. 7 T32N, R1E	SW Corner, Sec. 7 T32N, R1E	N 16° E	2,700
Koehler Ditch	29	NW¼ SE¼, Sec. 15 T32N, R1W	E¼ Corner,Sec. 15 T32N, R1W	S 86° W	1,600
Peterson Dam	30	NE¼ NW¼, Sec. 14 T32N, R1W	N¼ Corner, Sec. 14 T32N, R1W	S 18° W	340
Parker-Hufford Ditch	31	SE¼ SE¼, Sec. 16 T32N, R1W	SE Corner, Sec. 16 T32N, R1W	N 25° W	1,260
Plath Pipeline	32	SW¼ NW¼, Sec. 23 T32N, R1W	W¼ Corner, Sec. 23 T32N, R1W	N 26° E	1,120
Bogue Pipeline	33	SW¼ NW¼, Sec. 23 T32N, R1W	W¼ Corner, Sec. 23 T32N, R1W	N 26° E	1,120
Bogue Reservoirs	34	NE¼ NE¼, Sec. 22 T32N, R1W	NE Corner, Sec. 22 T32N, R1W	S 3° E	700
Parker Ditch	35	NE¼ NE¼, Sec. 20 T32N, R1W	NE Corner, Sec. 20 T32N, R1W	S 51° W	1,270
Bassett Ditch	36	SE¼ NW¼, Sec. 20 T32N, R1W	W¼ Corner, Sec. 20 T32N, R1W	N 79° W	1,710
Crowe Lower Ditch	37	NE¼ SW¼, Sec. 26 T32N, R2W	SW Corner, Sec. 26 T32N, R2W	N 51° E	2,350

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Crowe Pump	38	SW¼ SE¼, Sec. 5 T31N, R2W	S¼ Corner, Sec. 5 T31N, R2W	N 9° E	1,020
Crowe Reservoir Ditch	39	SE¼ NW¼, Sec. 9 T31N,R2W	N¼ Corner, Sec. 9 T31N,R2W	S 6° W	1,730
Grouse Spring	40	SW¼ NW¼, Sec. 12 T32N, R2E	NW Corner, Sec. 12 T32N,R2E	S 6° E	1,930
Beal Spring	41	NE¼ NE¼, Sec. 28 T32N,R2E	NE Corner, Sec. 28 T32N, R2E	S 12° W	920
Beal Creek Ditch	42	NW¼ NW¼, Sec.30 T32N, R2E	NW Corner, Sec. 30 T32N, R2E	S 68° E	520
German Ditch	43	SE¼ SE¼, Sec. 23 T32N, R1E	SE Corner, Sec. 23 T32N, R1E	N 59° E	1,100
Hufford-Knight Ditch	44	SE¼ SW¼, Sec. 5 T32N, R2E	S¼ Corner, Sec. 5 T32N, R2E	N 32° W	760
Atkins Mill Ditch	45	NW¼ NW¼, Sec. 8 T32N, R2E	NW Corner, Sec. 8 T32N, R2E	S 81° E	1,040
Knight South Ditch	46	SE¼ NE¼, Sec. 7 T32N, R2E	NE Corner, Sec. 7 T32N, R2E	S 30° W	1,970
Worden Ditch	47	NE¼ NE¼, Sec. 24 T32N, R1E	NE Corner, Sec. 24 T32N, R1E	Due West	820
Hagaman Gulch Ditch	48	SW¼ NW¼, Sec. 27 T32N, R1E	W¼ Corner, Sec. 27 T32N, R1E	N 65° E	1,000
Morelli-Carr Ditch	49	SE¼ NW¼, Sec. 30 T32N, R1E	N¼ Corner, Sec. 30 T32N, R1E	S 5° W	2,470
Upper Hamp Creek Ditch	50	NW¼ NE¼, Sec. 32 T32N, R1E	N¼ Corner, Sec. 32 T32N, R1E	S 73° E	380
Lower Hamp Creek Ditch	51	SE¼ SW¼, Sec.30 T32N, R1E	S¼ Corner, Sec. 30 T32N, R1E	N 5° W	540
Morelli Domestic Spring	52	SE¼ SE¼, Sec. 25 T32N, R1W	SE Corner, Sec. 25 T32N, R1W	N 12° W	1,270

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal Sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Lansing South Ditch	53	NE¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N, R1W	S 60° W	90
Rose Ditch	54	NE¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N, R1W	S 60° W	220
Lansing North Ditch	55	NE¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N, R1W	S 52° W	360
Rose Domestic Spring	56	NW¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N, R1W	S 80° W	1,800
Carr Stockwater Pump	57	NE¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N,R1W	S 49° W	1,730
Carr Domestic Pump	58	SW¼ NE¼, Sec. 36 T32N, R1W	NE Corner, Sec. 36 T32N, R1W	S 53° W	2,870
Lansing Domestic Spring	59	SE¼ NW¼, Sec. 1 T31N, R1W	W¼ Corner, Sec. 1 T31N, R1W	N 82° E	2,100
E. Hufford Ditch	60	SW¼ NE¼, Sec. 35 T32N, R1W	N¼ Corner, Sec. 35 T32N, R1W	S 1° E	2,040
Rolands-Staiger Ditch	61	SW¼ NE¼, Sec. 35 T32N, R1W	N¼ Corner, Sec. 35 T32N, R1W	S 2° E	2,070
E. Hufford Domestic Spring	62	SW¼ NE¼, Sec. 3 T31N, R1W	N¼ Corner, Sec. 3 T31N, R1W	S 12° E	2,380
Staiger Pump	63	NE¼ NE¼, Sec. 33 T32N, R1W	NE Corner, Sec. 33 T32N, R1W	S 46° E	1,600
South Cow Creek Powerhouse Ditch	64	NE¼ NW¼, Sec. 33 T32N, R1W	N¼ Corner, Sec. 33 T32N, R1W	S 9° W	330
Neely Bear Gulch Ditch	65	NW¼ SE¼, Sec. 17 T32N, R1E	SE Corner, Sec. 17 T32N, R1E	S 43° W	2,700
Turk and Cook Ditch	66	NW¼ NW¼, Sec. 20 T32N, R1E	NW Corner, Sec. 20 T32N, R1E	S 87° E	560
Covey North Springs	67	SW¼ NW¼, Sec. 24 T32N, R1W	W¼ Corner, Sec. 24 T32N, R1W	N 12° E	980

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Covey North Springs (contd.)	67	NE¼ NE¼, Sec. 23 T32N, R1W	NE Corner, Sec. 23 T32N, R1W	S 5° W	1,140
		SE¼ NE¼, Sec. 23 T32N, R1W	E¼ Corner, Sec. 23 T32N, R1W	N 7° W	1,250
Covey Main Spring	68	SW¼ NW¼, Sec. 24 T32N, R1W	W¼ Corner, Sec. 24 T32N,R1W	N 75° E	1,560
Covey Creek Ditch	69	NW¼ SE¼, Sec. 23 T32N, R1W	S¼ Corner, Sec. 23 T32N, R1W	N 18° E	1,800
Bullard Pump	70	NE¼ SE¼, Sec. 28 T32N,R1W	E¼ Corner, Sec. 28 T32N, R1W	S 84° W	760
Mill Creek Ditch	71	SW¼ SE¼, Sec. 28 T32N,R1W	S¼ Corner, Sec.28 T32N, R1W	N 55° E	730
Wagoner Ditch	72	NW¼ SW¼, Sec. 6 T31N,R1W	SW Corner,Sec. 6 T31N, R1W	N 20° E	2,120
Abbott Ditch	73	SW¼ SW¼, Sec. 6 T31N, R1W	NW Corner, Sec. 7 T31N,R1W	S 70° E	730
Jennie Hufford Pump	74	NE¼ SW¼, Sec. 11 T31N, R2W	S¼ Corner, Sec. 11 T31N, R2W	N 11° W	2,160
Hunt Pump	75	NE¼ NW¼, Sec. 15 T31N, R2W	N¼ Corner,Sec. 15 T31N, R2W	S 86° W	640
Espinosa Pumps	76	SE¼ NE¼, Sec. 13 T31N, R3W	E¼ Corner, Sec. 13 T31N, R3W	N 80° W	1,250
Roberts Pump	77	SW¼ NE¼, Sec. 13 T31N,R3W	N¼ Corner, Sec. 13 T31N, R3W	S 12° E	1,625
Hall South Pump	78	NW¼ SW¼, Sec. 13 T31N, R3W	SW Corner, Sec. 13 T31N,R3W	N 28° E	1,840
Hall North Pump	79	NW¼ SW¼, Sec. 13 T31N, R3W	SW Corner, Sec. 13 T31N, R3W	N 37° E	1,840
J. Hufford Pump	80	NE¼ SE¼, Sec. 14 T31N,R3W	E¼ Corner, Sec. 14 T31N,R3W	Due South	800

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner, in feet
Lynes Pump	81	SW¼ NE¼, Sec. 14 T31N, R3W	N¼ Corner, Sec. 14 T31N, R3W	S 27° E	1,780
Wetzel Pump	82	SE¼ NW¼, Sec. 14 T31N, R3W	N¼ Corner, Sec. 14 T31N, R3W	S 15° W	1,400
Meineken Pump	83	SE¼ NW¼, Sec. 14 T31N, R3W	NW Corner, Sec. 14 T31N, R3W	S 41° E	2,075
Blomquist Pump	84	SW¼ NW¼, Sec. 14 T31N, R3W	NW Corner, Sec. 14 T31N, R3W	S 32° E	1,900
Bishop Pump	85	SW¼ NW¼, Sec. 14 T31N, R3W	NW Corner, Sec. 14 T31N, R3W	S 5° E	1,800
Junkans South Pump	86	SE¼ NW¼, Sec. 10 T31N, R3W	N¼ Corner, Sec. 10 T31N, R3W	S 2° W	2,000
Junkans North Pump	87	NE¼ NW¼, Sec. 10 T31N, R3W	N¼ Corner, Sec. 10 T31N, R3W	S 27° W	1,375
Bingham Pump	88	NW¼ NW¼, Sec. 10 T31N, R3W	NW Corner, Sec. 10 T31N, R3W	S 48° E	1,830
Bingham Domestic Pump	89	NW¼ NW¼, Sec. 10 T31N, R3W	NW Corner, Sec. 10 T31N, R3W	S 42° E	1,550
Tuttle Pump	90	SE¼ NE¼, Sec. 9 T31N, R3W	NE Corner, Sec. 9 T31N, R3W	S 2° W	1,400
Shufelberger Pump	91	SE¼ NE¼, Sec. 9 T31N, R3W	NE Corner, Sec. 9 T31N, R3W	S 21° W	1,800
Schulz Pump	92	SE¼ NW¼, Sec. 9 T31N, R3W	NW Corner, Sec. 9 T31N, R3W	S 41° E	2,225
Frisbie Pump	93	NW¼ NW¼, Sec. 9 T31N, R3W	NW Corner, Sec. 9 T31N, R3W	S 32° E	1,325
Otten Pump	94	NW¼ NE¼, Sec. 8 T31N, R3W	NE Corner, Sec. 8 T31N, R3W	S 60° W	1,925
Leggett Pump	95	SW¼ NE¼, Sec. 8 T31N, R3W	NE Corner, Sec. 8 T31N, R3W	S 47° W	2,740

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner, in feet
Fraley North Pump	96	NE¼ NW¼, Sec. 17 T31N, R3W	NW Corner, Sec. 17 T31N, R3W	S 83° E	1,800
Dicker Reservoir	97	SE¼ NW¼, Sec. 18 T31N, R3W	N¼ Corner, Sec. 18 T31N, R3W	S 12° W	1,880
Harris Pump	98	SW¼ NW¼, Sec. 17 T31N, R3W	NW Corner, Sec. 17 T31N, R3W	S 24° E	1,660
Fraser Pump	99	NE¼ SW¼, Sec. 17 T31N, R3W	SW Corner, Sec. 17 T31N, R3W	N 34° E	3,000
Fraley South Pump	100	SE¼ SW¼, Sec. 17 T31N, R3W	SW Corner, Sec. 17 T31N, R3W	N 70° E	1,900
Maynard Pump	101	SW¼ NW¼, Sec. 20 T31N, R3W	NW Corner, Sec. 20 T31N, R3W	S 10° E	1,550
Kirkman Pump	102	NE¼ SW¼, Sec. 20 T31N, R3W	W¼ Corner, Sec. 20 T31N, R3W	Due East	1,500
Glassford Pump	103	NE¼ SW¼, Sec. 20 T31N, R3W	W¼ Corner, Sec. 20 T31N, R3W	S 82° E	1,650
Carter-McKee Pump	104	NE¼ SW¼, Sec. 20 T31N, R3W	W¼ Corner, Sec. 20 T31N, R3W	S 75° W	1,900
Stone-Fitzpatrick Pump	105	SE¼ SW¼, Sec. 20 T31N, R3W	S¼ Corner, Sec. 20 T31N, R3W	N 12° W	1,100
Morse Pump	106	SE¼ SW¼, Sec. 20 T31N, R3W	S¼ Corner, Sec. 20 T31N, R3W	N 19° W	350
A. F. Hufford Pump	107	NE¼ NW¼, Sec. 29 T31N, R3W	N¼ Corner, Sec. 29 T31N, R3W	S 30° W	75
Herman Pump	108	NE¼ NW¼, Sec. 29 T31N, R3W	N¼ Corner, Sec. 29 T31N, R3W	S 8° W	625
Swoboda Brothers Pump	109	NW¼ NE¼, Sec. 29 T31N, R3W	N¼ Corner, Sec. 29 T31N, R3W	S 9° E	1,500
Pearson Pump	110	SW¼ SE¼, Sec. 29 T31N, R3W	S¼ Corner, Sec. 29 T31N, R3W	N 4° E	600

TABLE A-2 (contd.)

Name of diversion system	Number of diversion on State Water Rights Board Map	Location of point of diversion: Legal sub-division in which diversion occurs MDB&M	Reference corner for distance and bearing MDB&M	Bearing from reference corner	Distance from reference corner in feet
Beatie Pump	111	NW¼ NW¼, Sec. 5 T30N, R3W	NW Corner, Sec. 5 T30N, R3W	S 53° E	1,450
Beatie Stockwater Pump	112	NW¼ NW¼, Sec. 5 T30N, R3W	NW Corner, Sec. 5 T30N, R3W	S 51° E	1,480
Bryant Pump	113	SE¼ NW¼, Sec. 5 T30N, R3W	NW Corner, Sec. 5 T30N, R3W	S 49° E	2,700
R. Hawes West Pump	114	SE¼ SW¼, Sec. 5 T30N, R3W	SW Corner, Sec. 5 T30N, R3W	N 53° E	2,520
R. Hawes East Pump	115	SE¼ SW¼, Sec. 5 T30N, R3W	SW Corner, Sec. 5 T30N, R3W	N 71° E	2,460
M. Hawes Pump	116	NW¼ NW¼, Sec. 8 T30N, R3W	N¼ Corner, Sec. 8 T30N, R3W	Due South	150

TABLE A-3

SUMMARY OF IRRIGATION DIVERSION SYSTEMS
AND LANDS IRRIGATED
1964

Name of owner	Diversion number	Name of diversion	Acreage irrigated * Under diversion	Acreage irrigated * Total
Abbott, Allan G.	73	Abbott Ditch	96.0	96.0
Albert, Wertzel	6	Grindlay-Williams Ditch	3.2	3.2
Atkins, Leary B.	24	Atkins Ash Creek Ditch	4.1	
	25	Atkins Upper Spring	50.8	
	26	Atkins Lower Spring	16.4	
	28	Brown-Grover Ditch	23.4	94.7
Bargsten, Ernest F.	36	Bassett Ditch	229.6	229.6
Beatie, Arthur H.	111	Beatie Pump	66.8	66.8
Bingham, B. C.	88	Bingham Pump	11	11
Bishop, Jack	85	Bishop Pump	0.3	0.3
Blomquist, Theodore M.	84	Blomquist Pump	36.3	36.3
Bogue, H. E.	34	Bogue Reservoirs	31.3	31.3
Boksa, Demeter	24	Atkins Ash Creek Ditch	6.5	6.5
Brady, Jack	43	German Ditch	29.4	29.4
Brewer, Lowell D.	28	Brown-Grover Ditch	193.2	193.2
Bryant, Robert S.	113	Bryant Pump	40.2	40.2
Bullard, Harry E.	70	Bullard Pump	2.0	2.0
Carr, Pierre G.	49	Morelli-Carr Ditch	22.2	22.2
Carter, Paul L.	102	Kirkman Pump	2.0	
	104	Carter-McKee Pump	0.5	2.5
Cherta, John	102	Kirkman Pump	4.2	4.2

* Lands under development or construction for irrigation in 1964 are not included.

TABLE A-3 (contd.)

Name of owner	Diversion number	Name of diversion	Acreage irrigated* Under diversion	Total
Clark, William C.	102	Kirkman Pump	16	16
Covey, Myrtle Jurdy	67	Covey North Spring	8.2	
	68	Covey Main Spring	13.8	22.0
Covey, Harry N.	67	Covey North Spring	3.6	
	68	Covey Main Spring	supplemental	3.6
Crowe Hereford Ranch	36	Bassett Ditch	630.0	
	37	Crowe Lower Ditch	133.0	
	38	Crowe Pump	10	773.0
Dargatz, Leo H.	19	Dargatz Spring	15.8	15.8
Dicker, C. M., Inc.	97	Dicker Reservoir	1.0	1.0
Donohue, Paul	67	Covey North Spring	13.4	
	68	Covey Main Spring	6.6	20.0
Dymesich, George J.	28	Brown-Grover Ditch	21.0	21.0
Espinosa, Harold C.	76	Espinosa Pumps	48.7	48.7
Faber, Darrell W.	42	Beal Creek Ditch	10.0	10.0
Farrell, V. R.	73	Abbott Ditch	74.8	74.8
Fitzpatrick, David P.	105	Stone-Fitzpatrick Pump	43.8	43.8
Fraley, Harold L.	96	Fraley North Pump	54.6	
	100	Fraley South Pump	13	67.6
Frisbie, E. C.	93	Frisbie Pump	19.0	19.0
Gibson, Laine	43	German Ditch	2.0	2.0
Gilbert, Roxie R.	28	Brown-Grover Ditch	166.0	
	35	Parker Ditch	3.0	169.0
Glassford, Roy	102	Kirkman Pump	1.6	
	103	Glassford Pump	0.6	2.2

TABLE A-3 (contd.)

Name of owner	Diversion number	Name of diversion	Acreage irrigated* Under diversion	Total
Grindlay, Helen V.	6	Grindlay-Williams Ditch	56.0	
	12	Grindlay Upper Glendenning Creek Ditch	34.0	
	13	Grindlay Lower Glendenning Creek Ditch	7.0	
	14	Grindlay South Glendenning Creek Ditch	2.6	99.6
Hall, Jura Lawrence	78	Hall South Pump	32.1	
	79	Hall North Pump	22.5	54.6
Harris, John M.	98	Harris Pump	1.0	1.0
Hawes, Melvin	116	M. Hawes Pump	59.0	59.0
Hawes, Roy B.	114	R. Hawes West Pump	10.4	
	115	R. Hawes East Pump	13	23.4
Herman, William F.	108	Herman Pump	39.0	39.0
Hoffman, Margot	108	Herman Pump	2.5	2.5
Hufford, Albert F.	107	A. F. Hufford Pump	33.4	33.4
Hufford, Elmer	44	Hufford-Knight Ditch	11.2	
	45	Atkins Mill Ditch	11.8	
	60	E. Hufford Ditch	119.0	142.0
Hufford, Jennie	74	Jennie Hufford Pump	0.4	0.4
Hufford, Jesse. D., Jr.	80	J. Hufford Pump	93.4	93.4
Hufford, Jesse, Estate of	31	Parker-Hufford Ditch	193.2	
	36	Bassett Ditch	79.8	273.0
Hunt, W. H., Estate Co.	73	Abbott Ditch	112.9	
	75	Hunt Pump	30.2	143.1
Hutchins, William L.	6	Grindlay-Williams Ditch	3.0	3.0
Johnson, J.	102	Kirkman Pump	1.0	1.0
Jones, Ellis T.	73	Abbott Ditch	14.6	14.6
Jones, Jesse C.	73	Abbott Ditch	13.4	13.4
Jungsten, Henry J.	69	Covey Creek Ditch	4.6	4.6

TABLE A-3 (contd.)

Name of owner	Diversion Number	Name of diversion	Acreage irrigated* Under diversion	Total
Junkans, Elmer	86	Junkans South Pump	29	
	87	Junkans North Pump	40.6	69.6
Knight, Remi C.	44	Hufford-Knight Ditch	44.2	
	45	Atkins Mill Ditch	31.6	
	46	Knight South Ditch	4.2	80.0
Koehler, Roderick	29	Koehler Ditch	37.5	
	31	Parker-Hufford Ditch	5.6	43.1
Lansing, Lucille	53	Lansing South Ditch	121.7	
	55	Lansing North Ditch	46.2	167.9
Leggett, Howard M.	95	Leggett Pump	176.6	176.6
Lynes, Ronald E.	81	Lynes Pump	39.1	39.1
Maynard, R.	101	Maynard Pump	48.4	48.4
MacMillan, Emma B.	7	MacMillan Spring	1.5	1.5
McKee, Charles N.	102	Kirkman Pump	4.6	
	104	Carter-McKee Pump	0.4	5.0
McTimmonds, Guy W.	43	German Ditch	37	37
Miller, C. Elbert and Weller, Edward F.	43	German Ditch	24.8	24.8
Mix, Robert H.	43	German Ditch	2.6	2.6
Morelli, Virginia Lee	42	Beal Creek Ditch	24.4	
	48	Hagaman Gulch Ditch	supplemental	
	49	Morelli-Carr Ditch	46.8	
	50	Upper Hamp Creek Ditch	17	
	51	Lower Hamp Creek Ditch	2.1	90.3
Morse, Alvin	106	Morse Pump	10	10
Murphy, Richard M.	5	Murphy Ditch	269.8	
	8	Murphy Upper Spring	supplemental	
	9	Murphy Lower Springs	supplemental	269.8
Murphy, Tal E.	110	Pearson Pump	2.2	2.2
Neely, Laurence C.	16	Neely Glendenning Creek Ditch	10	
	17	Neely Spring	9.2	
	24	Atkins Ash Creek Ditch	0.1	
	65	Neely Bear Gulch Ditch	22.1	41.4

TABLE A-3 (contd.)

Name of owner	Diversion number	Name of diversion	Acreage irrigated* Under diversion	Acreage irrigated* Total
North Valley Title and Escrow Company	108	Herman Pump	5.0	5.0
Otten, Alex J.	94	Otten Pump	23.0	23.0
Owbridge, June M.	20	Owbridge Upper East Side Ditch	11.6	
	21	Owbridge Upper West Side Ditch	9.2	
	22	Owbridge Lower East Side Ditch	2.6	
	23	Owbridge Lower West Side Ditch	2.7	
	24	Atkins Ash Creek Ditch	0.3	26.4
Pacific Gas & Electric Company	68	Covey Main Spring	5.9	5.9
Parker, James	31	Parker-Hufford Ditch	82.5	
	35	Parker Ditch	12.7	95.2
Pearson, Glenn	110	Pearson Pump	209.6	209.6
Peterson, Charlie E.	28	Brown-Grover Ditch	60.7	60.7
Powell, Byron T.	28	Brown-Grover Ditch	1.7	1.7
Reimer, George	43	German Ditch	64.2	64.2
Robinson, James W.	102	Kirkman Pump	5.0	5.0
Roesner, Elmer W.	83	Meineken Pump	2.0	2.0
Roland, Henry E.	61	Rolands-Staiger Ditch	44.2	44.2
Rose, Ellis	54	Rose Ditch	2.4	2.4
Rynd, Donald E.	43	German Ditch	4.0	4.0
Schmitt, James W.	28	Brown-Grover Ditch	8.3	8.3
Schulz, Walter P.	92	Schulz Pump	31.4	31.4
Scott Lumber Company	41	Beal Spring	8.4	8.4

TABLE A-3 (contd.)

Name of owner	Diversion number	Name of diversion	Acreage irrigated* Under diversion	Acreage irrigated* Total
Scott, C. Emlen	15	Scott Spring	7.4	7.4
Shufelberger, Vern	91	Shufelberger Pump	98.6	98.6
Skipworth	6	Grindlay-Williams Ditch	2.2	2.2
Smith, Donald V.	55	Lansing North Ditch	4.0	4.0
Staiger, J. Dana	61	Rolands-Staiger Ditch	33.6	33.6
Stone, F. C.	105	Stone-Fitzpatrick Pump	11.4	11.4
Swoboda, John F.	109	Swoboda Brothers Pump	24.2	24.2
Swoboda, Lawrence J.	109	Swoboda Brothers Pump	14	14
Tippin, Jerry W.	108	Herman Pump	2.5	2.5
Turk, Ellen H. and Cook, Roger D.	66	Turk and Cook Ditch	4.2	4.2
Tuttle, Carl F., Jr.	90	Tuttle Pump	119.6	119.6
Wagoner, W. G.	72	Wagoner Ditch	3.7	3.7
Walker, Archie D., Jr. (c/o Shasta Forests Company)	43	German Ditch	142.2	
	50	Upper Hamp Creek Ditch	0.8	143.0
Weir, Frank B.	43	German Ditch	7.0	7.0
Welch, Alvador	31	Parker-Hufford Ditch	52.8	
	36	Bassett Ditch	23.6	76.4
Wetzel, Wesley	82	Wetzel Pump	15	15
Wiley, Marvin L.	43	German Ditch	17.9	17.9
Williams, Wallace B.	6	Grindlay-Williams Ditch	25.6	
	11	Williams Lower Ditch	82.3	107.9
Worden, Gilbert T.	47	Worden Ditch	74.8	74.8
Wurst, Leroy G.	28	Brown-Grover Ditch	116.0	116.0
Zeis, Melvin	102	Kirkman Pump	4.9	4.9
		Totals	5,774.9	5,774.9

TABLE A-4

DESCRIPTION OF DIVERSION SYSTEMS

The diversion systems from the portion of Cow Creek stream system under investigation, as numbered on the State Water Rights Board Map, are described below. All location descriptions refer to Mount Diablo Base and Meridian. Periods of records concerning diversions and water supply are for the 1964 season unless specified otherwise.

Diversion 1 called Latour Springs, includes three springs developed for fire protection purposes in the upper watershed.

Latour State Forest has constructed 500-gallon storage tanks at each spring cooperatively with Shasta Forests Company, agent for the owners on whose lands the developments have been built.

The springs are located as follows:

Lot 10 of Section 1, T32N, R2E, within Old Cow Creek watershed
NE¼ of SE¼ of Section 3, T32N, R2E, within South Cow Creek watershed
SE¼ of SE¼ of Section 32, T33N, R2E, within South Cow Creek watershed

Diversion 2 called No. One Road Pumps, consists of two portable pumps, one on the east side of West Hunt Creek within the SW¼ of NW¼ of Section 20, T33N, R2E, and the other on the west side of West Canyon Creek within the NW¼ of NW¼ of Section 24, T33N, R1E.

The pumps lift water into elevated steel tanks for filling water trucks used by Kimberly-Clark Corporation in maintaining their logging roads in the vicinity. The installations are just off the Corporation's main logging road, called One Road. West Hunt Creek was flowing about 1 cubic foot per second in the fall of 1964.

Diversion 3 is the Kilarc Powerhouse Ditch from the south side of Old Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 25, T33N, R1E.

A concrete dam 50 feet long and 13 feet high diverts water into the ditch about 10 feet wide and 5 feet deep. About 250 feet below the diversion point a 5.5-foot concrete critical-depth meter equipped with a water stage recorder measures the flow.

The amount diverted is adjusted and occasionally reduced so as to satisfy the diversion requirements of the Grindlay-Williams Ditch (Diversion 6) which diverts from Old Cow Creek below this ditch and above the Kilarc Powerhouse tailrace. Daily mean discharge as measured by the critical-depth meter for a portion of 1964 is set forth in Table B-9. During the entire 1963-64 water year ending September 30, 1964, 22,242 acre-feet were measured flowing past the meter. Daily discharge varied from a maximum of 55 cubic feet per second on May 6 and 7 to no flow during a 17-day shutdown period in April.

A short distance below the measuring station a siphon carrying water diverted from Canyon Creek (Diversion 4) discharges into the ditch. About 0.25 mile below the recorder the ditch enters a tunnel 950 feet in length which carries the water through a steep sidehill. The 3.5-mile conduit terminates in the Kilarc Forebay on top of the ridge known as Miller Mountain. A steel penstock conducts the water from the forebay to the Kilarc Powerhouse on the south bank of Old Cow Creek below Ponderosa Road Bridge. The installation is owned by the Pacific Gas and Electric Company. Pertinent powerhouse statistics are given on the following page.

Installed generating capacity	3,000 kilowatts
Maximum daily mean discharge of ditch in 1963-64 water year. Contribution from Canyon Creek siphon not included	55.4 cubic feet per second
Forebay capacity	30.4 acre-feet
Penstock size	48 inch to 36 inch
Penstock length	4,801 feet
Static head	1,192 feet
Type of wheel	2 Pelton single impulse wheels
Date built	1903

Water available for diversion decreases during the summer and by the latter part of September 1964 only about 22 cubic feet per second was passing the recorder. The powerhouse is operated mostly on base load so as to maintain a reasonably constant tailrace discharge into Old Cow Creek.

Diversion 4 is the Canyon Creek Ditch which diverts water from both the west and east branches of Canyon Creek. The west branch diversion point is within the NE¼ of SE¼ of Section 23, T33N, R1E, and the east branch diversion point is within the SW¼ of SW¼ of Section 24, T33N, R1E. Total ditch flow was measured at 3.26 and 2.41 cubic feet per second on July 6 and August 13, 1964, respectively. Capacity is estimated to be 5 cubic feet per second.

The diversion on the west branch consists of an earth dam about 1.5 feet high and 10 feet long which diverts the entire flow of the stream during the summer months into an earth ditch about 3 feet wide and 1 foot deep. On August 13, 1964, the flow was estimated to be 1 cubic foot per second. This ditch extends about 0.3 mile to the second point of diversion on the east

branch. A concrete dam about 1.5 feet high and 22 feet long diverts the entire flow of this branch during the summer months into the ditch which is enlarged at this point to about 3 feet wide and 2 feet deep. The combined flow is then conducted about 0.7 mile to a concrete box on the north canyon wall of Old Cow Creek. A 3.5-foot Cipolletti weir measures the ditch flow at this point before it enters the 2-foot diameter, 0.25 mile long inverted siphon which carries the water across Old Cow Creek for discharge into the Kilarc Powerhouse Ditch (Diversion 3) for use in generating power at the Kilarc Powerhouse owned by the Pacific Gas and Electric Company.

Diversion 5 is the Murphy Ditch from the west side of West Canyon Creek within the SW¼ of SE¼ of Section 23, T33N, R1E.

A rock dam about 5 feet long and 1 foot high diverts most of the flow during the summer months into a ditch about 3 feet wide and 1 foot deep. On July 1, 1964, the measured flow about 0.25 mile above the place of use was the full ditch capacity of 1.0 cubic foot per second, while on August 13 the amount being diverted at the diversion dam was 0.48 cubic foot per second. The ditch is about 2.7 miles long and irrigates 269.8 acres on the Richard M. Murphy Ranch. Supplemental water is supplied to these lands by springs on the Murphy Ranch (Diversions 8 and 9).

Diversion 6 is the Grindlay-Williams Ditch from the south side of Old Cow Creek within the NW¼ of SW¼ of Section 27, T33N, R1E.

A log and rock dam 25 feet long and 2 feet high diverts water into a ditch about 4 feet wide and 1 foot deep which carries the combined water for the Helen V. Grindlay and Wallace B. Williams Ranches and several smaller parcels.

About 0.25 mile below the point of diversion the flow is separated by a proportional divider so dimensioned that 5/9 of the amount diverted flows into the upper Grindlay lateral and 4/9 flows into the lower Williams lateral. The capacity of the Grindlay lateral immediately below the division point is about 2.5 cubic feet per second. A 2-foot weir was installed in the lateral 2 miles below the division point for the 1964 irrigation season. Discharge at this point varied from 1.4 cubic feet per second in June to 1.0 cubic foot per second in August. The lateral continues 2.75 miles to the Grindlay Ranch, crossing enroute the Kilarc Powerhouse penstock before leaving the Old Cow Creek Canyon and traversing more level country within the Glendenning Creek watershed. The ditch normally irrigates 56.0 acres of pasture, orchard, and garden on the Grindlay Ranch; however, in 1964, 22.2 acres of the place of use were not irrigated.

1.75
2.75
4.5

The Williams lateral is about 3 feet wide and 1 foot deep. The capacity is 2.1 cubic feet per second, and the ditch flow about 1.1 miles below the point of division just above all takeouts varied from 2.1 to 1.0 cubic feet per second during 1964. In recent years the place of use has been divided and the water diverted now serves four users.

The first takeout consists of a 1-inch pipe submerged in the ditch above Ponderosa Way. About 400 feet of 1-inch plastic pipe leads across Ponderosa Way to the Skipworth property where water diverted is used to irrigate 2.2 acres of pasture by flooding. This right is reportedly 1 miner's inch or 0.02 cubic foot per second and represents a part of the old appropriative right for the Williams Ranch.

The second takeout is 100 feet downstream from the Skipworth pipe and consists of a gravity diversion into a 1-inch plastic pipe. A short

length of this pipe delivers the water to a 1/4-horsepower electric powered pump which provides pressure for domestic use at a house trailer on a 5-acre parcel owned by W. L. Hutchins. The property was reportedly deeded 1 miner's inch or 0.02 cubic foot per second of the Williams Ranch old appropriative right.

The next two branches from the Williams lateral divert a portion of the flow westerly for irrigation of 25.6 acres of pasture, orchard, and garden on the Williams Ranch on both sides of Ponderosa Way, although in 1964, 1.6 acres of the place of use were not irrigated.

The main ditch continues about 1/4 mile and terminates on the Albert property where 3.2 acres are irrigated. This property has reportedly been allotted 10 miner's inches or 0.2 cubic foot per second of the Williams Ranch old appropriative right.

Drainage from all lands irrigated from the Williams lateral collects in three reservoirs on the Williams property where it is used for recreation and fish culture. Overflow and seepage from these reservoirs is intercepted by the Williams Lower Ditch (Diversion 11) and conveyed to the Williams Lower Ranch.

Use of water from the diversion is summarized below:

Name		Irrigated acreage
Helen V. Grindlay		56.0 acres
Skipworth		1.0 acre
W. L. Hutchins		domestic
Wallace B. Williams		25.6 acres
H. Albert		3.2 acres
	Total	85.8 acres

Diversion 7 is the MacMillan Spring in the Old Cow Creek watershed within the SW¼ of SE¼ of Section 28, T33N, R1E.

At the spring a wooden settling tank is used to collect water for diversion into a 1-inch pipe for conveyance to the place of use about 0.25 mile away. Use is for domestic purposes and irrigation of 1.5 acres of lawn, garden, and orchard on the Emma B. MacMillan property.

Diversion 8 is the Murphy Upper Spring within the SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 21, T33N, R1E.

The spring has been excavated creating a 10-foot by 6-foot pool which leads into a wooden box 10 feet long by 4 feet wide. The water is then diverted into a 4-inch pipe for sprinkler irrigation by gravity of 25.0 acres of hay and pasture land on the upper bench of the Richard M. Murphy Ranch. Flow through the pipe on August 13, 1964, was 17 gallons per minute equivalent to 0.04 cubic foot per second.

Diversion 9 consists of the Murphy Lower Springs within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$, NE$\frac{1}{4}$ of NW$\frac{1}{4}$, and SE$\frac{1}{4}$ of NE$\frac{1}{4}$, of Section 28, T33N, R1E. Several springs are grouped under this diversion.

The uppermost one is on the upper bench of the Murphy Ranch. The spring has been excavated and the flow diverted into a ditch 1 foot wide and 0.5 foot deep. On August 13, 1964, the flow of this spring was measured at 18 gallons per minute equal to 0.04 cubic foot per second, however, most of the other springs were not flowing on this day. The ditch extends easterly and irrigates pasture and hay land on the upper bench. Supplemental water is also served to these lands from Diversions 5 and 8 and from several undeveloped springs.

Drainage from the upper bench and other undeveloped springs is picked up at several points for gravity sprinkler irrigation and flood

irrigation of hay and pasture lands on the middle bench. Several small ditches have been constructed to control the flow from the spring areas across a half-mile front extending generally east to west, and conduct the water onto the ridges of the rolling terrain for irrigation of pasture. The total acreage irrigated on the Richard M. Murphy Ranch by this diversion and by Diversions 5 and 8 in 1964 was 269.8 acres.

Diversion 10 is the Kilarc Domestic Spring within the SE¼ of NW¼ of Section 33, T33N, R1E. Spring discharge is about 0.10 cubic foot per second.

The spring is located above the Kilarc Powerhouse on the south canyon slope above Old Cow Creek. It has been excavated and enclosed by a concrete dam 20 feet long and 2 feet high. Excess flow is carried off in an 8-inch bypass pipe. About 300 feet of 4-inch pipe diverts water to a 5,000 gallon storage tank. From this tank 760 feet of 2-inch pipe delivers water to the Kilarc Powerhouse where it is used for domestic purposes in the powerhouse and two residences across Old Cow Creek on property of the Pacific Gas and Electric Company.

Diversion 11 is the Williams Lower Ditch from the southeast side of Old Cow Creek within the NW¼ of NE¼ of Section 32, T33N, R1E.

A rock and board dam about 45 feet long and 2 feet high across the creek diverts a portion of the flow into a rectangular wooden flume 18 inches wide, 1 foot deep, and 90 feet long which discharges into an earth ditch 3 feet wide and 1 foot deep. On August 24, 1964, the full ditch capacity of 2.26 cubic feet per second was being diverted although only 1.14 cubic feet per second reached the place of use about 1.5 miles below the diversion point.

Just above the place of use the ditch divides into two branches which circle the irrigated pasture on the west and east. The ditch flood irrigates 82.3 acres of pasture on the Wallace B. Williams Lower Ranch. Of this total, 11.0 acres were not irrigated in 1964.

Substantial amounts of water draining from lands irrigated from the Williams lateral of the Grindlay-Williams Ditch (Diversion 6) and from springs are intercepted by this ditch. In fact, the diversion works on Old Cow Creek have not been used for several years and all water applied to the place of use has been intercepted in this manner. In 1964 the Old Cow Creek diversion works were rebuilt and first used in late August.

Diversion 12 is the Grindlay Upper Glendenning Creek Ditch from the north side of Glendenning Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 10, T32N, R1E.

A low rock dam about 15 feet long has been used to divert water into a ditch 3 feet wide and 1 foot deep. Capacity of the ditch is about 2 cubic feet per second. It is about 0.5 mile long and is used to irrigate by flooding 34.0 acres of pasture adjacent to Glendenning Creek on the Helen V. Grindlay property. This diversion was not used during 1964, although water was available in the creek.

Diversion 13 is the Grindlay Lower Glendenning Creek Ditch from the north side of Glendenning Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 9, T32N, R1E.

A log and rock dam 9 feet long and 1 foot high diverts water into a ditch 1.5 feet wide and 1 foot deep. On August 19, 1964, the full ditch capacity of 0.5 cubic foot per second was being diverted. The place of use

consists of 7.0 acres of irrigated pasture on the Helen V. Grindlay property beginning about 100 feet below the diversion dam. This acreage is adjacent and below the place of use under Diversion 12 and may receive drainage from that system.

Diversion 14 is the Grindlay South Glendenning Creek Ditch from the south side of Glendenning Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 9, T32N, R1E.

A rock and earth dam 8 feet long and 1 foot high diverts water into a ditch 1.5 feet wide and 0.5 foot deep which carries the water about 100 feet to the place of use. On August 19, 1964, about 0.1 cubic foot per second was being diverted. Ditch capacity is about 0.2 cubic foot per second. The pasture is irrigated by flooding and contains 2.6 acres adjacent to the creek on the Helen V. Grindlay property.

Diversion 15 is the Scott Spring within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 33, T33N, R1E. The spring is in the Old Cow Creek watershed but does not produce enough water to contribute to the flow of the creek.

The entire spring flow is diverted into a small ditch about 300 feet long which conducts the water around the place of use consisting of 7.4 acres of pasture on the E. Scott property. In 1964 the spring flow was insufficient to adequately irrigate the entire place of use.

Diversion 16 is the Neely Glendenning Creek Ditch from the south side of Glendenning Creek within the NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 9, T32N, R1E.

A rock dam has been used to divert water into a ditch about 2 feet wide and 1 foot deep. Capacity of the ditch is about 1 cubic foot per

second. It is about 0.5 mile in length and was used to irrigate 10 acres of pasture and orchard on the Laurence C. Neely property lying northeast of the intersection of Ponderosa Way and Tamarack Road. The diversion has not been used for several years.

Diversion 17 is the Neely Spring about 200 feet south of Glendenning Creek within the NW¼ of NE¼ of Section 17, T32N, R1E. Discharge of the spring was 1.50 cubic feet per second on June 17, 1964.

The entire spring flow is diverted into two earth ditches about 2 feet wide and 0.5 foot deep, for flood irrigation of 9.2 acres of hay and pasture land adjacent to the spring and to Glendenning Creek on the Laurence C. Neely property.

On June 17, 1964, about 0.9 cubic foot per second was diverted into the north ditch lateral and 0.6 cubic foot per second to the high or south lateral.

Diversion 18 is the Owbridge East Ditch from the north side of an unnamed waste water gulch within the SE¼ of NW¼ of Section 8, T32N, R1E.

This diversion, located east of Ponderosa Way, in years past conducted water westerly across Ponderosa Way for irrigation of land on the June M. Owbridge property lying on both sides of Ash Creek. The ditch is no longer used and much of the land previously irrigated by this diversion is now served by Diversions 20, 21, 22, and 23. Water formerly available for diversion consisted of return flow from lands irrigated by the Grindlay lateral of the Grindlay-Williams Ditch (Diversion 6).

Appropriative rights on file for this diversion consist of licenses issued on Applications 3256 and 8522 which are described in Appendix C.

Diversion 19 is the Dargatz Spring, tributary to Ash Creek, a small tributary to Glendenning Creek. The spring is located in the NW¼ of SE¼ of Section 5, T32N, R1E. Its flow on September 1, 1964, was 0.43 cubic foot per second and on November 5, 1964, was 0.50 cubic foot per second.

A concrete box 2.5 feet high and 18 feet long has been built around the lower side of the spring forming a pool. Three conduits lead from the box, two serving the Leo H. Dargatz property and one serving the Helen V. Grindlay property.

At the south end of the box a 10-inch tile pipe conducts a portion of the water southerly for use on the Dargatz property. About 600 feet below the spring a 1-inch pipe taps the large pipe and conducts a small flow down the hill for domestic use at the ranch house. Just below this point a valve in the 10-inch main may turn the water down the hill through an old abandoned water-powered mill and into a gravity irrigation system. The next connection a few feet away consists of another domestic service pipe for a second house. The 10-inch pipe continues about 1,000 feet and discharges into a ditch system for irrigation of the southerly portion of the pasture on this ranch.

Near the north end of the spring box a 10-inch glory hold spillway is used to conduct water from the spring box into the spring channel for diversion downstream into a ditch for irrigation of the northern part of the Dargatz pasture. Return flow from this land accumulates in the water course formed by the spring called Ash Creek. At one time a pump and sprinkler system was used to redivert this water and irrigate 4.8 acres of pasture adjacent to the channel. This land was not irrigated in 1964. The

two conduit systems that were used in 1964 irrigated a total of 11 acres of pasture by wild flooding on the Leo H. Dargatz Ranch.

The third conduit leading from the spring box is a 2-inch pipe, paralleling the 10-inch line mentioned above, which carries domestic water 0.3 mile across Ponderosa Way for service at the Grindlay house.

Diversion 20 is the Owbridge Upper East Side Ditch from the east side of Ash Creek within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 5, T32N, R1E.

A rock and board dam 1 foot high and 5 feet long diverts water into the ditch which is about 2 feet wide, 0.5 foot deep, and 600 feet long. On August 21, 1964, the full ditch capacity of about 0.3 cubic foot per second was being diverted. It is used to flood irrigate 11.6 acres of pasture adjacent to the creek on the June M. Owbridge property. Of this total, 2.0 acres were not irrigated in 1964.

Diversion 21 is the Owbridge Upper West Side Ditch from the west side of Ash Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E.

An earth dam 1 foot high and 6 feet long diverts water into a ditch 2 feet wide, 0.5 foot deep, and 600 feet long for flood irrigation of 9.2 acres of pasture adjacent to the stream on the June M. Owbridge property. Of this total, 5.2 acres were not irrigated in 1964. On August 21, 1964, about 0.2 cubic foot per second was being diverted. Ditch capacity is about 0.4 cubic foot per second.

Diversion 22 is the Owbridge Lower East Side Ditch from the east side of Ash Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E.

A small earth dam diverts water into a ditch 1.5 feet wide, 0.5

foot deep, and 600 feet long for flood irrigation of 2.6 acres of pasture adjacent to the creek on the June M. Owbridge property. On August 21, 1964, the full ditch capacity of about 0.15 cubic foot per second was being diverted. Water available for diversion is nearly all return flow from lands above, irrigated by the upper ditches on Ash Creek.

Diversion 23 is the Owbridge Lower West Side Ditch from the west side of Ash Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E.

An earth and rock dam 6 feet long and 1 foot high diverts water into an earth ditch 2 feet wide, 0.5 foot deep, and 600 feet long for flood irrigation of 2.7 acres of pasture adjacent to the stream channel on the June M. Owbridge property. On August 21, 1964, the full ditch capacity of about 0.1 cubic foot per second was being diverted. Water available for diversion is nearly all return flow from lands irrigated by the upper ditches on Ash Creek.

Diversion 24 is the Atkins Ash Creek Ditch from the northwest side of Ash Creek within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E.

A log and earth dam 4 feet high and 8 feet long diverts water into a ditch 2 feet wide, 0.5 foot deep, and 600 feet long. On September 1, 1964, 0.54 cubic foot per second was being diverted. Ditch capacity is about 0.75 cubic foot per second. The place of use consists of 4.1 acres of flood irrigated pasture on the Leary B. Atkins property. Water available for diversion is nearly all return flow from the upper irrigated lands along Ash Creek.

This diversion also irrigates 6.5 acres owned by Demeter Boksa, 0.3 acre owned by June M. Owbridge, and 0.1 acre owned by Laurence C. Neely.

Diversion 25 is the Atkins Upper Spring in the Glendenning Creek watershed within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 7, T32N, R1E.

The entire output of the spring, amounting to about 1.5 cubic feet per second, is diverted into a ditch about 2 feet wide and 1 foot deep. A short distance below the spring the ditch divides, one lateral irrigating pasture land to the north, and the other continuing westerly to serve pasture lands higher on the hill. The flow in the westerly lateral can be regulated by a reservoir holding about 3 acre-feet. The diversion flood irrigates a total of 50.8 acres on the Leary B. Atkins property. Most of the water draining from these lands is intercepted by the ditch leading from Atkins Lower Spring (Diversion 26).

Diversion 26 is the Atkins Lower Spring just south of Glendenning Creek channel within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 7, T32N, R1E.

The entire spring output of about 0.5 cubic foot per second is diverted into a ditch about 2 feet wide and 1 foot deep which runs parallel to Glendenning Creek and Old Cow Creek for about 1 mile. The place of use consists of 16.4 acres of flood irrigated pasture on the Leary B. Atkins property lying on the sidehill between the ditch and the creek. This ditch intercepts water draining from lands irrigated by the Atkins Upper Spring (Diversion 25).

Diversion 27 is the Atkins Domestic Spring within Lot 4 of Section 7, T32N, R1E. The spring is in the Old Cow Creek watershed but does not produce enough water to contribute to the flow of the creek.

A 2-inch iron pipe buried in the spring area develops a flow of about 1 gallon per minute. The pipeline is about 100 feet long and irrigates

an adjacent 0.2 acre of garden near the ranch buildings on the Leary B. Atkins property.

Diversion 28 is the Brown-Grover Ditch from the north side of Old Cow Creek within Lot 3 of Section 7, T32N, R1E.

A rock and log dam 2 feet high and 50 feet long diverts a portion of the flow into a ditch 6 feet wide and 2 feet deep. A spillway near the head of the ditch controls the amount diverted.

Measurements of ditch flow in 1964 are summarized below:

Date	Location	Cubic feet per second
May 7	above Atkins lateral	7.6
July 16	above Atkins lateral	8.2
September 3	above Atkins lateral	11.2
September 3	head of ditch	15.2

On September 3 water was spilling over the ditch bank above Atkins lateral and the capacity of the ditch is estimated to be 12 cubic feet per second.

The ditch is about 4.2 miles in length and serves irrigation water to five ranches. There is one lateral to each ranch and proportional dividers in the ditch automatically divide the flow to each in the proportions tabulated below, in downstream order. The tabulation also shows the total irrigated acreage on each ranch which claims a right to water from the diversion.

Name	Portion of flow	Irrigated acreage
Leary B. Atkins	1/12	23.4
Charlie E. Peterson	1/12	60.7
Leroy G. Wurst	2/12	116.0
Lowell D. Brewer	4/12	193.2
Roxie R. Gilbert	4/12	166.0
	Total	559.3

The lateral for the Leary B. Atkins Ranch is about 0.8 mile below the diversion works on the south ditch bank. The place of use consists of flood irrigated pasture. The northern portion of the field is irrigated by a branch lateral which flumes across the main ditch. Drainage from these lands also irrigates 4.5 acres of pasture on the Peterson Ranch within the SE¼ of SE¼ of Section 11, and the NE¼ of NE¼ of Section 14 which is included in the acreage shown above for Peterson and 1.7 acres owned by Byron T. Powell within the NW¼ of NW¼ of Section 13, all being within T32N, R1W. After irrigating Atkins and Peterson lands the drainage water collects in Coal Gulch and is available for diversion at Peterson Dam (Diversion 30) just downstream.

The next lateral, on the south side of the main ditch about 0.75 mile below the Atkins lateral, flood irrigates pasture land on the Peterson Ranch between the ditch and Coal Gulch.

The third lateral which serves the Wurst property is about 0.4 mile below the Peterson lateral. It flood irrigates pasture lying on both sides of the main ditch.

The main ditch continues an additional 1.6 miles to the Brewer Ranch division point. The irrigated land served by this lateral is south and east of Fern Road. Several pickup ditches are used to spread the water and prevent it from collecting in gulches that cut across the irrigated land. Several culverts are used to carry the water south across Whitmore Road for irrigation of 21 acres of pasture on the George J. Dymesich property and 8.3 acres of pasture on the James W. Schmitt property. There were 7.0 acres and 0.6 acre, respectively, on these two ranches that were not irrigated in 1964.

The ditch terminates on the Roxie R. Gilbert property west of Fern Road. Water supplied to the higher fields is collected in pickup ditches and conducted south across Whitmore Road to serve land on that side.

The total acreage normally irrigated by the Brown-Grover Ditch is 590.3 acres.

Most of the drainage from the lands served by this ditch returns to Old Cow Creek upstream from the diversion works for the Bassett Ditch (Diversion 36).

Diversion 29 is the Koehler Ditch from the south side of Old Cow Creek within the NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 15, T32N, R1W.

A rock dam 2 feet high and 15 feet long diverts a portion of the flow into a ditch 6 feet wide and 1 foot deep. On May 21, 1964, the ditch flow near the head was at full capacity of 8.9 cubic feet per second. The ditch is about 0.3 mile long and flood irrigates 37.3 acres of pasture on the Roderick Koehler property.

A large portion of the water applied to the land drains off with about 1/4 of the drainage returning directly to Old Cow Creek and 3/4 being intercepted by the Parker-Hufford Ditch (Diversion 31).

Diversion 30 is the Peterson Dam on Coal Gulch within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T32N, R1W.

An earth dam about 24 feet high and 250 feet long has been built across the channel. On the south abutment a 10-foot wide spillway 5 feet below dam crest will be used as the intake to an earth irrigation ditch constructed in 1964. The ditch, which is about 3 feet wide and 1 foot deep,

will conduct the water about 1,100 feet to the place of use consisting of 24.4 acres of flood irrigated pasture on the Charlie E. Peterson property, lying between Coal Gulch and Old Cow Creek. This diversion was not ready for use in 1964. In addition to the proposed irrigation use, the regulatory reservoir created by the dam has been used for stock water and fish culture. Capacity of the reservoir is estimated to be 40 acre-feet.

During the irrigation season most of the water flowing into the reservoir is return flow from the Leary B. Atkins property irrigated from the Brown-Grover Ditch (Diversion 28).

Diversion 31 is the Parker-Hufford Ditch from the south side of Old Cow Creek within the SE¼ of SE¼ of Section 16, T32N, R1W.

A concrete and flashboard dam 30 feet long and 3 feet high diverts a portion of the flow into a concrete-walled channel leading about 100 feet to the earth ditch which is about 5 feet wide and 2 feet deep. A 10-foot spillway in the concrete section of the ditch is used to control the amount of water diverted.

On both May 12 and July 15, 1964, ditch flow 300 feet above the siphon was at full ditch capacity of 10 cubic feet per second. At the diversion dam 6.7 cubic feet per second was being diverted on May 12. Ditch flow between these two points is augmented by drainage from lands irrigated by the Koehler Ditch (Diversion 29). The overall length of the ditch is about 4 miles and it serves a narrow strip of land on the side hill south of Old Cow Creek.

The acreage irrigated and the reported ditch ownership are tabulated below in downstream order.

Name	Reported ditch right	Irrigated acreage
Roderick Koehler	1/4	5.6
Alvador Welch	1/4	52.8
James Parker	1/4	82.5
Estate of Jess Hufford, Sr.	1/4	193.2
	Total	334.1

The pasture on the Koehler property north of Whitmore Road is irrigated by several cuts in the ditch bank. The ditch crosses Whitmore Road in an 18-inch inverted steel siphon about 500 feet long. About 1.25 miles below the siphon a division box automatically turns 1/3 of the remaining water north into a lateral for irrigation of pasture land on the Parker property. This lateral also furnishes supplemental water to the westerly portion of the area irrigated by the Parker Ditch (Diversion 35) lower on the side hill.

About 1 mile below the Parker lateral a division box automatically divides the remaining water, half to the Welch property and half to the Hufford property.

The Hufford lateral continues about 0.5 mile before reaching its service area of flood irrigated pasture adjacent to the creek on property of the Estate of Jess Hufford. A total of 6.8 acres were not irrigated in 1964. The lands irrigated by the ditch contribute large amounts of return flow to Old Cow Creek.

Diversion 32 is the Plath Pipeline from the east side of Fern Spring channel within the SW¼ of NW¼ of Section 23, T32N, R1W. Measured spring flow was 0.16 cubic foot per second on August 28, 1964.

A 1-inch steel pipe buried in the channel about 20 feet below the spring diverts water to a small tank which serves domestic needs at the William F. Plath house adjacent to the channel. A small lawn area around the house is also served.

Diversion 33 is the Bogue Pipeline from Fern Spring within the SW¼ of NW¼ of Section 23, T32N, R1W. Flow of the spring was 0.16 cubic foot per second on August 28, 1964.

A 1-inch plastic pipe submerged in the excavated spring conducts domestic water about 3,000 feet along the west side of the spring channel for use at two houses on the H. E. Bogue property.

Diversion 34 includes the three Bogue Reservoirs that are filled by Fern Spring and its channel. They are within the NE¼ of NE¼ of Section 22, T32N, R1W.

A small ditch about 400 feet long is used to divert water from the spring channel into the first reservoir lying south of the channel. A 2-inch pipe through the embankment conveys the regulated flow from this reservoir to two small fields north of the spring channel planted to pasture and irrigated by sprinklers. Two other regulating reservoirs in series on the spring channel are used to irrigate by a gravity system pasture land lying south of the spring channel. There are 31.3 acres irrigated by this system on the H. E. Bogue property. After about the first week in June of 1964 contributions from this spring reaching Old Cow Creek were negligible.

Diversion 35 is the Parker Ditch from the south side of Old Cow Creek within the NE¼ of NE¼ of Section 20, T32N, R1W.

A low rock dam diverts a portion of the flow into a ditch 3 feet wide and 1 foot deep. On May 29, 1964, the full ditch capacity of 2.6 cubic feet per second was being diverted and on July 23, 1964, 2.1 cubic feet per second were being diverted. The ditch conducts the water about 1,000 feet to the place of use consisting of 12.7 acres of flood irrigated pasture adjacent to the creek on the James Parker property and 3.0 acres owned by Roxie R. Gilbert. The westerly portion of the irrigated land receives drainage from lands higher on the hill irrigated by the Parker-Hufford Ditch (Diversion 31).

Diversion 36 is the Bassett Ditch from the north side of Old Cow Creek within the SE¼ of NW¼ of Section 20, T32N, R1W.

Diversion is by a concrete and flashboard dam 5 feet high and 83 feet long into a ditch 10 feet wide and 2 feet deep. The overall length of the ditch is about 8 miles. It supplies irrigation water to pasture and hay lands sloping toward Old Cow Creek, and in its last 3 miles serves lands bordering Basin Hollow, a small tributary to Cow Creek from the north.

A water stage recorder was maintained in the ditch 0.5 mile below the diversion works at a point just above the first lateral. The daily mean record of flow obtained at this station is presented in Table B-11.

During 1964, the maximum flow in the ditch at the recorder station was 30 cubic feet per second and the minimum was 18.5 cubic feet per second. The average flow during the irrigation season was 24 cubic feet per second. The recorded flow includes about 0.25 cubic foot per second drainage from the Gilbert lands irrigated by the Brown-Grover Ditch

(Diversion 28). The Bassett Ditch is operated so as to divert the entire flow of Old Cow Creek when its flow recedes to about 25 cubic feet per second. Lands irrigated by the ditch, however, return substantial amounts of water to the creek. Return flow from lands irrigated within the watershed of Basin Hollow flow about 2.5 miles down that stream to its confluence with the main stem of Cow Creek. Intermittent observations of the flow of Basin Hollow at its confluence with Cow Creek are contained in Table B-8. During the irrigation season this water is entirely return flow.

The Bassett Ditch irrigates four ranches as set forth in the following tabulation, in downstream order.

Name	Reported ditch right		Acreage irrigated
Alvador Welch	2/20		23.6
Estate of Jess Hufford, Sr.	3/20		79.8
Ernest F. Bargsten	3/20		229.6
Crowe Hereford Ranch	12/20		630.0
		Total	963.0

The ditch delivers water to its laterals through headgates proportioned so as to automatically turn out the correct amount. The first is 0.5 mile below the diversion dam on the south side of the ditch where 2/20 of the flow is diverted into the Welch lateral for irrigation of pasture lands on this ranch.

The second lateral is on the south ditch bank at the east property line of the Hufford Ranch about 0.6 mile below the Welch lateral. At this point 2/20 of the original amount diverted less losses to this point is taken into a lateral which borders the old county road for about 0.75 mile for irrigation on the Hufford Ranch of lands south of this road. About 0.3 mile below this second lateral a third division box separates the remaining

1/20 of total ditch flow for use by the Hufford Ranch south of the old road. Three small reservoirs on the ranch are kept full with drainage water from these lands.

About 0.6 mile below the lower Hufford lateral a division box diverts 3/20 of the original amount to the south for use on the Bargsten property. This lateral divides immediately into a branch running east for irrigation of that part of the ranch, and a westerly branch along the side hill for irrigation of the portion of the ranch north and west of the ranch buildings.

The remaining 12/20 of total ditch diversion is for the Crowe Hereford Ranch. The ditch crosses the Whitmore Road and continues about 1 mile to the first division point on the ranch. The south lateral irrigates pasture northwest of the road before crossing the road for irrigation of a large block of pasture extending for over a mile on the west side of Old Cow Creek.

The north lateral continues on for about 1.75 miles to a division box on the southeast side of Whitmore Road. The largest of these conveys water east and then south around a knoll for irrigation of a large area of pasture on rolling hills sloping south to Old Cow Creek. The smaller one leads through a saddle to the southwest, along the Whitmore Road, and into the Basin Hollow watershed. About 0.3 mile below this division, the north lateral is tapped by a small diameter pipe for domestic use at the ranch buildings of the Crowe upper ranch below the ditch. This lateral is then used to irrigate 30.9 acres of pasture immediately below the ranch on the north side of Basin Hollow. This stream channel, or an alternate parallel ditch, is used to convey the remaining water about

1 mile, crossing to the south side of Whitmore Road, for irrigation of a strip of pasture on the south side of Basin Hollow lying east of the main ranch headquarters. Return flow reaching the channel of Basin Hollow is available for diversion by the Crowe Pump (Diversion 38). There were 8.6 acres on the Crowe Ranch that were not irrigated in 1964.

Diversion 37 is the Crowe Lower Ditch from the south side of Old Cow Creek within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 26, T32N, R2W.

Diversion is by a rock dam sealed by plastic sheeting about 30 feet long and 2 feet high. A vertical flashboard headgate controls the amount of water entering the ditch. Ditch flow near the head was 5.6 cubic feet per second on May 8, 1964, and 6.1 cubic feet per second on July 16, 1964. Ditch capacity is about 6.5 cubic feet per second. The ditch is about 2 miles long and flood irrigates 133.0 acres of pasture on the Crowe Hereford Ranch lying east and south of Old Cow Creek. Of this total, 18.8 acres were not irrigated in 1964.

During late summer the diversion is operated so as to divert nearly the entire flow of the creek. The Bassett Ditch (Diversion 36) next upstream also diverts nearly the entire flow of Old Cow Creek in late summer and the flow in the creek reaching the Crowe Lower Ditch during this part of the season is nearly all return flow from lands irrigated from the Bassett Ditch and the Parker-Hufford Ditch (Diversion 31). Return flow from the Crowe Lower Ditch is sufficient to maintain a continuous stream in Old Cow Creek to its confluence with South Cow Creek. During August of 1964 the flow of Old Cow Creek reaching this point of confluence was between 5 and 10 cubic feet per second.

Diversion 38 is the Crowe Pump from the north side of Basin Hollow within the SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 5, T31N, R2W.

Diversion is by centrifugal pump driven by a 5-horsepower electric motor. Suction lift is about 3 feet through a 3-inch pipe and discharge lift is about 22 feet through a 2-inch pipe. Measured pump discharge was 117 gallons per minute. Pressure on the discharge side of the pump was 52 pounds per square inch. A 4-inch diameter sprinkler system is used for irrigation of 10 acres of pasture north of the pump on the Crowe Hereford Ranch near the ranch headquarters. All water available for diversion at this point during the irrigation season is return flow from Crowe Hereford Ranch lands upstream irrigated by the Bassett Ditch (Diversion 36).

Diversion 39 is the Crowe Reservoir Ditch from the northwest side of Old Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 9, T31N, R2W.

A low diversion dam across the creek diverts water into a ditch about 500 feet long which delivers the water to a reservoir with a surface area of 3 acres. The earth embankment creating the reservoir is about 300 feet long. A spillway at the northwest abutment conveys excess water about 0.25 mile to Old Cow Creek.

The reservoir is used for fish culture and stockwatering on the Crowe Hereford Ranch.

Diversion 40 is Grouse Spring near the summit of McMullen Mountain in the South Cow Creek watershed. The spring is within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 12, T32N, R2E.

Water is stored at the spring in a 5,000-gallon tank. A 2-inch steel pipe then conveys the water about 4,000 feet to a second 5,000-gallon

tank at the Latour State Forest headquarters for domestic use.

The camp is closed for about four months during the winter but as many as 40 people are housed there during the summer, including a fire crew, forestry crew, and prisoners engaged in conservation work.

Diversion 41 is Beal Spring within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 28, T32N, R2E.

At one time the spring flow was diverted by a low earth and rock dam into a ditch 3 feet wide and 1 foot deep which conducted the water along the contour of the hill for about 1,400 feet to the place of use on the "Old Joe Beal Place" now owned by the Scott Lumber Company. The place of use consisted of 8.4 acres of irrigated pasture. In the fall of 1964 the spring flow was about 1.5 cubic feet per second. The diversion has not been used for several years.

Diversion 42 is the Beal Creek Ditch from the south side of Beal Creek within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 30, T32N, R2E.

A rock and brush dam about 20 feet long and 5 feet high diverts a portion of the flow into the earth ditch about 3 feet wide and 1 foot deep.

Ditch capacity is about 4 cubic feet per second. The low flow of Beal Creek at this diversion during 1964 was about 5 cubic feet per second. On September 3, 1964, the ditch flow was 1.7 cubic feet per second above all laterals at the Johnson Spring Road.

About 1.8 miles below the diversion point a division box separates 1/3 of the flow into a lateral about 700 feet long leading westerly for irrigation of 10 acres of pasture on the Darrell W. Faber property.

Drainage from this land may be collected in a small reservoir. About 12.6 acres of pasture on the south side of the Faber property are irrigated by diversion from Dickerson Creek which is in the Bear Creek watershed.

The remaining 2/3 of the water continues in the main ditch south of the Faber lateral in a westerly direction for about 2 miles to the Old Garden Ranch now owned by Virginia Lee Morelli. This ranch is reportedly entitled to 1/3 of the water diverted. The main ditch divides into north and south branches before reaching the place of use on this ranch which consists of 24.4 acres. The north branch joins the Hagaman Gulch Ditch (Diversion 48) before reaching the irrigated land. During the summer months the entire flow of Hagaman Gulch is return flow from the Faber lands irrigated from Beal Creek Ditch.

The last 1/3 interest in the ditch was at one time owned by the Clinton Hufford Ranch on the north side of Hamp Creek. This ranch is now owned by Virginia Lee Morelli. Any unused water in Beal Creek Ditch plus return flows from the Garden Ranch collect naturally in Hamp Creek and flow about 1 mile down this stream for diversion into the Hamp Creek Ditch (Diversion 50) for irrigation of 17 acres of pasture owned by Mrs. Morelli. About 0.8 acre owned by A. Walker, Jr., et al. is also irrigated.

The Beal Creek Ditch was not used during 1963 and in 1964 was first opened on August 29.

Diversion 43 is the German Ditch from the north side of South Cow Creek within the SE¼ of SE¼ of Section 23, T32N, R1E.

Water is diverted by a rock and board dam about 5 feet high and 30 feet long into an earth ditch about 9 feet wide and 2 feet deep. A

wooden headgate and spillway at the head of the ditch control the amount of water diverted. The ditch closely follows South Cow Creek for 1.38 miles where it has gained sufficient elevation above the creek to turn north out of the canyon towards the service area which consists of widely scattered parcels of land on the level divide between South Cow Creek and Old Cow Creek. Most of the service area is tributary to Glendenning Creek or Old Cow Creek and return flow from irrigated land augments the flow of these two creeks. The overall length of the ditch is about 6 miles.

A staff gage was maintained at the head of the ditch during 1964, and the section was rated by current meter. Water stage recorders were kept in South Cow Creek just above the diversion point and in the ditch 1.38 miles below the diversion dam at the point where the ditch turns north. Discharge records obtained by these recorders are presented in Tables B-3 and B-12, respectively. Daily mean flow in the ditch at the recorder during the period of record varied from 9.6 to 13.7 cubic feet per second.

The diversion system is owned by the South Cow Creek Ditch Association composed of the shareholders listed on the following page. The lands shown under the name of Shasta Forests Company are administered by this company but are actually owned by other people, as shown on the State Water Rights Board Map.

Owner	Shares	Reported water right, in cubic feet per second (each share = 10 miner's inches measured under 4-inch pressure)	Extent of use
Shasta Forests Company			
Millers Meadow			Irr. of 10.0 acres
Hufford Place			Irr. of 42.1 acres
Dailey Place			Irr. of 90.1 acres
Total	25	5.00	
Pacific Gas & Electric Company	14.9	2.98	Power generation at South Cow Creek Powerhouse
George Reimer	4.1	.82	Irr. of 64.2 acres
Guy McTimmonds	2.5	.50	Irr. of 37.0 acres
Jack Brady	2.5	.50	Irr. of 29.4 acres
Edward Weller and C. Elbert Miller	4.0	.80	Irr. of 24.8 acres
Marvin Wiley	2.0	.40	Irr. of 17.9 acres
Frank Weir	0.5	.10	Irr. of 7.0 acres
Robert Mix	0.2	.04	Irr. of 2.6 acres
Laine Gibson	0.2	.04	Irr. of 2.0 acres
Mary Chellis	0.2	.04	Domestic
Donald Rynd	0.2	.04	Irr. of 4.0 acres
Leslie Combs	0.1	.02	Domestic
Remi C. Knight	0.1	.02	Domestic at five houses
Totals	56.5	11.30	331.1 acres

In addition to the shareholders listed on the Association books other users receive water either directly from the ditch or as drainage or return flow. These are listed below:

Name	Amount	Extent of use
Earl F. Scott		Domestic
Whitmore State Forestry Station		Domestic use at the station consisting of about 1 acre of lawn and garden, about 3 houses and a barracks. Service to about 20 people during the summer
Ellen H. Turk and Roger D. Cook		Domestic use and irrigation of 4.2 acres of garden, pasture and Christmas trees

The Neely property consisting of 22.3 acres of irrigated pasture south of Tamarack Road and east of Whitmore State Forestry Station is irrigated from Neely Bear Gulch Ditch (Diversion 65) by return flow from lands irrigated from the German Ditch draining into the gulch.

The German Ditch is operated to divert a constant flow throughout the irrigation season and sufficient water was always available in South Cow Creek in 1964 for a full ditch. All division boxes on the ditch are proportioned to automatically deliver the proper amount of water to each shareholder. A ditch tender is employed to maintain and repair the diversion dam and ditch and keep all division boxes clear of debris.

The first lateral from the ditch leads northeasterly about 2 miles to the Miller and Weller property, the Millers Meadow property and the Dailey place, both administered by Shasta Forests Company. The Miller and Weller property has a small regulatory reservoir which is kept full by

a branch of the lateral. Water is also used for domestic purposes at the houses near the reservoir. The main branch of the lateral continues north on the east side of the Miller and Weller pasture across the Bateman Road and irrigates the Millers Meadow place. The last ranch served by this lateral is the Dailey place. Two branches of the lateral are used on this ranch, one irrigating the northern portion and the other serving the southern part. Some regulation is provided by a reservoir near the eastern edge of the pasture.

After about June 1 of each year the flow of Dailey Creek below the Dailey place is return flow from water supplied to this ranch from the German Ditch. Frequent measurements of flow in Dailey Creek were taken at Tamarack Road in 1964, and these records are presented in Table B-8 to indicate the magnitude of return flow reaching Glendenning Creek from this source.

At the same point of beginning on the German Ditch for the lateral just described, a second lateral leads north 0.25 mile for irrigation of the Hufford place administered by Shasta Forests Company.

The main ditch continues nearly due west for about 0.75 mile to the third lateral which leads north a short distance to a point of division. The eastern branch conveys water for irrigation of the McTimmonds property and the western branch irrigates the Reimer lands. A 2-inch pipe in the McTimmonds branch conveys domestic water about 0.3 mile north to the ranch buildings. The Reimer place of use also includes a small orchard and a forested area growing Christmas trees. A small regulatory reservoir near the ranch headquarters is kept full by a branch ditch.

Return flow from water applied to the Hufford place, McTimmonds Ranch, and Reimer Ranch provides water to Bear Gulch and is available for diversion below into the Neely Bear Gulch Ditch (Diversion 65). Intermittent measurements of the flow in Bear Gulch are set forth in Table B-8.

The fourth lateral from the main ditch is about 0.5 mile below the McTimmonds and Reimer lateral. It provides domestic service and a small amount of irrigation water to 6 properties just north of Ponderosa Way. The first takeout on this lateral automatically diverts the correct proportion of flow to the Mix property where it is used for domestic purposes and irrigation of orchard and garden. A small reservoir at the lower end of the property is also maintained full. The next takeout serves domestic water to the Scott house. The third one automatically conveys the proper amount of water to the Gibson property where it is used for domestic purposes and irrigation of garden and lawn. Two small reservoirs are used to regulate the water. This property has been purchased from Theodore D. and Mary L. Chellis. The fourth takeout consists of an automatic division box where water is taken for domestic purposes at a house trailer on the Chellis property. Below this the remaining water is used on the Rynd and Combs properties. Three takeouts are used for irrigation of orchard and pasture on the Rynd place lying partly north of the lateral and partly south of the main German Ditch. Regulation is provided by a small reservoir in the eastern part of the parcel. The last use on this lateral is for domestic purposes on the Combs property. Any unused water in the lateral may be spilled back into the main German Ditch at this point.

The fifth lateral off the south bank of the German Ditch conveys water across to the south side of Ponderosa Way for domestic and irrigation

use on the Weir and Wiley Ranches. The Weir Ranch irrigated lands consist of pasture of which 3.5 acres were idle in 1964, whereas the Wiley lands include pasture and about 3 acres of apple orchard. Drainage from these two places flows toward South Cow Creek rather than towards Glendenning Creek as is true on all other lands irrigated from the German Ditch. However, no return flow was observed reaching South Cow Creek from either ranch.

The sixth lateral serves the Brady Ranch, Whitmore State Forestry Station, and the Turk and Cook Ranch. About 0.4 mile below its head the lateral divides into two equal branches, one leading to the irrigated pasture and orchard lands on the Brady Ranch, and the other toward the Forestry Station storage tanks about 220 feet below the division point. Water is conducted from the lowermost tank to the station through about 0.7 mile of 2-inch pipe. All water in excess of the capacity and needs of the station water supply system amounting to about 0.5 cubic foot per second is spilled into a natural water course at the storage tanks. This water flows northeasterly across Ponderosa Way and past the old Miller Sawmill log pond where it is diverted into the Turk and Cook Ditch (Diversion 66).

The seventh and last lateral is the Knight Pipeline. A 4-inch pipe is submerged in an excavated section of the German Ditch and conveys a small flow 1 mile northerly to the town of Whitmore. The system serves domestic water to four houses south of the county road owned by Remi C. Knight and one house to the north owned by J. G. Reynolds.

The German Ditch below the Knight Pipeline carries water to the lowermost user, the Pacific Gas and Electric Company. The terminus of the

German Ditch is about one mile below the Knight Pipeline in a natural water course within Mill Creek watershed. The power company uses the streambed of Mill Creek to conduct the water to its Mill Creek Ditch (Diversion 71) for eventual use in generating power at the South Cow Creek Powerhouse.

On August 12, 1964, the flow of the German Ditch just above the Knight Pipeline was 1.4 cubic feet per second.

Diversion 44 is the Hufford-Knight Ditch from the northwest side of Atkins Creek within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 5, T32N, R2E.

A rock dam about 1 foot high and 5 feet long diverts water into a ditch 6 feet wide, 1 foot deep, and about 1.25 miles long. Flow in the ditch 800 feet below the diversion dam was 3.1 cubic feet per second on May 22 and at full ditch capacity of 3.3 cubic feet per second on July 15, 1964. At a point below all Hufford turnouts the flow was 2.7 cubic feet per second on July 17. Beginning about 0.25 mile below the diversion works there are several takeouts used to flood irrigate pasture and orchard owned by Elmer Hufford.

About 0.75 mile below the diversion dam water may be turned into 2,200 feet of 6-inch steel penstock for generation of power at a 5 kilowatt Pelton wheel powerplant near the creek under a head of 152 feet. Power generated is used on the Remi C. Knight Ranch. The lower end of the penstock is tapped by a small pipe which supplies domestic water to a house on the Knight Ranch to the east of the penstock. Water discharging through the powerplant tailrace is diverted into a ditch and used for irrigation of the lower pasture on the Knight Ranch.

A short distance below the penstock intake a 1-inch pipe submerged in the main ditch conducts domestic water about 0.5 mile southwesterly to ranch buildings on the Knight property.

The main ditch continues on for flood irrigation of the principal body of pasture on the Knight Ranch. One high lateral supplies water to a regulating reservoir on the north edge of the irrigated lands.

Total acreage irrigated from the ditch consists of 11.2 acres on the Elmer Hufford property and 44.2 acres on the Remi C. Knight property. Supplemental water is furnished to some of these lands on both ranches by the Atkins Mill Ditch (Diversion 45).

Diversion 45 is the Atkins Mill Ditch from the northwest side of Atkins Creek within the NW¼ of NW¼ of Section 8, T32N, R2E.

A low rock dam 14 feet long diverts water into a ditch 4 feet wide, 1 foot deep and about 0.75 mile long. On May 22, 1964, ditch flow above all takeouts was at full ditch capacity of 2.0 cubic feet per second. On May 22 and July 17, 1964, ditch flow below all Hufford takeouts was 1.1 and 0.34 cubic feet per second, respectively. The diversion flood irrigates 11.8 acres of pasture owned by Elmer Hufford and 31.6 acres of pasture on the Remi C. Knight property. Ditch flow is augmented by drainage from the Hufford-Knight Ditch (Diversion 44) which runs parallel at a higher level on the hill. It is reported that many years ago the ditch provided power for a mill.

Diversion 46 is the Knight South Ditch from the southeast side of Atkins Creek within the SE¼ of NE¼ of Section 7, T32N, R2E.

A low rock dam has been used to divert water into a ditch 2 feet wide, 1/2 foot deep, and about 500 feet long. The dam has been washed

out and the diversion was not used in 1964. The place of use consists of 4.2 acres of irrigated pasture adjacent to the creek on the Remi C. Knight property.

Diversion 47 is the Worden Ditch from the west side of Atkins Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 24, T32N, R1E.

A concrete and flashboard dam 4 feet high and 40 feet long diverts water into a ditch 9 feet wide and 2 feet deep. Ditch flow at a point about 400 feet below the head was at full ditch capacity of 4.4 cubic feet per second on May 20, 1964. On July 16 ditch flow was 3.3 cubic feet per second. About 0.2 mile below the dam a ditch lateral may be used to take water across Atkins Creek through a 12-inch pipe for irrigation of a strip of pasture adjacent to the east creek bank.

The main ditch continues southward high on the side hill for about 0.3 mile to an intake structure for a 14-inch penstock where water may be diverted through 300 feet of pipe to a small Pelton wheel power-plant on the bank of Atkins Creek. Plant head is about 57 feet. The power generated is used for domestic purposes on the Gilbert T. Worden Ranch.

The main ditch turns northwesterly and circles the principal body of irrigated land for about 0.5 mile and terminates in a small regulating reservoir. A portable pump in this reservoir is used to operate a sprinkler system for irrigation of pasture to the west and south.

There are 74.8 acres of pasture irrigated by this diversion on the Worden property of which 1.9 acres were not irrigated in 1964.

Diversion 48 is the Hagaman Gulch Ditch from the south side of Hagaman Gulch within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 27, T32N, R1E.

Diversion is by an earth and log dam about 1$\frac{1}{2}$ feet high and 10 feet long which diverts the entire flow of the gulch into a ditch about 1$\frac{1}{2}$ feet wide and 1 foot deep. In May 1964 ditch flow at Ponderosa Way was estimated at 0.3 cubic foot per second, all of which was natural flow of Hagaman Gulch. Capacity of the ditch is about 1$\frac{1}{2}$ cubic feet per second. The ditch runs westerly across Ponderosa Way about 0.9 mile to the place of use consisting of 24.4 acres of flood irrigated pasture on the Virginia Lee Morelli Ranch. During 1964, 6.6 acres normally irrigated were left idle.

About 1/4 mile above the place of use a lateral from the Beal Creek Ditch (Diversion 42) joins the ditch from the south. The combined flow can be divided again before reaching the place of use - one branch going to the westerly portion and one to the easterly portion. The water available for diversion during the summer months is nearly all return flow from the northern portion of the Faber Ranch which is irrigated from Beal Creek Ditch. Since Beal Creek Ditch was not opened until August 29, 1964, very little water was available for diversion into Hagaman Gulch Ditch in 1964.

Diversion 49 is the Morelli-Carr Ditch from the south side of South Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 30, T32N, R1E.

A log and rock dam 3 feet high and 20 feet long diverts a portion of the flow into a ditch about 3 feet wide, 1 foot deep and about 1$\frac{1}{4}$ miles long. On June 15, 1964, the flow in the ditch was 1.4 cubic feet

per second and on July 23 it was 1.5 cubic feet per second. Capacity of the ditch is about 2 cubic feet per second. The ditch irrigates a few acres north of Hamp Creek. However, most of the water is carried across Hamp Creek to the main body of irrigated land. There are 46.8 acres of hay and pasture land on the Virginia Lee Morelli property served by this ditch. The ditch continues on and irrigates 22.2 acres of hay and pasture land on the Pierre G. Carr property.

Diversion 50 is the Upper Hamp Creek Ditch from the north side of Hamp Creek within the NW¼ of NE¼ of Section 32, T32N, R1E.

An earth dam 25 feet long and 5 feet high diverts the entire flow during the irrigation season into a ditch 2 feet wide, 1 foot deep and about 0.75 mile long. Capacity is about 1 cubic foot per second. The ditch divides into two branches before reaching the 17 acres of irrigated pasture on the ridge between South Cow Creek and Hamp Creek owned by Virginia Lee Morelli. This ditch also irrigates 0.8 acre of pasture on the Archie D. Walker, Jr., property lying to the east. The natural flow of Hamp Creek is small during the late summer and the main purpose of this ditch is to divert the 1/3 share of water brought in through the Beal Creek Ditch (Diversion 42).

Because Beal Creek Ditch was not opened until August 29, 1964, very little, if any, use was made of this diversion in 1964.

Diversion 51 is the Lower Hamp Creek Ditch from the south side of Hamp Creek within the SE¼ of SW¼ of Section 30, T32N, R1E.

There was no diversion dam in 1964. However, the ditch is about 3 feet wide and 1 foot deep and has a capacity of about 1 cubic

foot per second. It extends about 1,600 feet westerly and serves the same general place of use as the Morelli-Carr Ditch (Diversion 49). It also serves 2.1 acres lying above this ditch on the Virginia Lee Morelli property. During the irrigation season the flow of Hamp Creek consists almost entirely of return flow from lands irrigated by the Beal Creek Ditch (Diversion 42). The diversion was not used in 1964.

Diversion 52 is the Morelli Domestic Spring within the SE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 25, T32N, R1W, tributary to South Cow Creek.

A 1-inch pipe diverts water from the spring about 1,000 feet southeasterly to the Virginia Lee Morelli house where it is used for domestic purposes.

Diversion 53 is the Lansing South Ditch from the south side of South Cow Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W.

A concrete and flashboard dam 26 feet long and 2 feet high diverts water into a section of 30-inch pipe which delivers the water to the ditch which is about 4 feet wide, 1 foot deep and 2 miles in length. Flow in the ditch 0.75 mile below the diversion dam but above all turnouts was 2.7 cubic feet per second on May 28, 1964, and at full ditch capacity of 3.6 cubic feet per second on July 24. About 0.75 mile below the diversion dam the ditch reaches the upper edge of the place of use which consists of 121.7 acres of pasture on the Lucille Lansing Ranch adjacent to the south bank of South Cow Creek. Of this total 13.4 acres were not irrigated in 1964.

The upper lateral of the ditch terminates in a small regulating reservoir near the ranch headquarters where a 7$\frac{1}{2}$-horsepower electric

powered pump lifts the water for sprinkler irrigation of several acres of pasture above the ditch.

A lower lateral continues westerly through the middle of the irrigated lands and conveys water for an additional 0.75 mile for irrigation of a narrow strip of pasture adjacent to the creek.

Diversion 54 is the Rose Ditch from the north side of South Cow Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W.

A rock dam 35 feet long and 2 feet high diverts water into an earth ditch 1 foot wide and 1/2 foot deep. Capacity of the ditch is about 0.5 cubic foot per second, although on June 15, 1964, only about one gallon per minute was reaching the place of use. The ditch conveys water about 2,000 feet to the place of use consisting of 2.4 acres of lawn and orchard near the ranch house on the Ellis E. Rose property. Any drainage is intercepted by the Lansing Upper Ditch (Diversion 55) which runs beneath and parallel to the Rose Ditch.

Diversion 55 is the Lansing North Ditch from the north side of South Cow Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W.

A low rock dam diverts water into the ditch which is 3 feet wide and 1 foot deep. Ditch flow 0.6 mile below the diversion dam above all turnouts was at full ditch capacity of 3.8 cubic feet per second on May 28, 1964. On July 24 flow was 1.9 cubic feet per second. The ditch is about 1.5 miles long and irrigates 4.0 acres of pasture on the Donald V. Smith property and 46.2 acres of pasture on the Lucille Lansing Ranch lying north of the creek in a narrow strip.

Diversion 56 is the Rose Domestic Spring within the NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W, tributary to South Cow Creek.

A 1-inch pipe diverts water southerly from the spring about 1,000 feet to the Ellis E. Rose house for domestic use.

Diversion 57 is the Carr Stock Water Pump from the south side of South Cow Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W.

Diversion is by a centrifugal pump driven by a 3/4-horsepower electric motor. Suction lift is about 6 feet through a 3/4-inch pipe and discharge lift is about 14 feet through a 3/4-inch pipe. Pump discharge is about 20 gallons per minute. The pump operates on a 40-pound pressure tank system and supplies water to the barns nearby for use by livestock on the Pierre G. Carr property.

Diversion 58 is the Carr Domestic Pump from the south side of South Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 36, T32N, R1W, about 1,000 feet downstream from the Carr Stockwatering Pump (Diversion 57).

Diversion is by a small pump driven by a 1/2-horsepower electric motor. Suction lift is about 15 feet through a 1-inch pipe. Static lift above the pump is about 9 feet through a 3/4-inch outlet pipe about 100 feet in length. Capacity of the pump is estimated to be 20 gallons per minute. The water enters a 40-pound pressure tank system for domestic use at the Pierre G. Carr residence.

Diversion 59 is the Lansing Domestic Spring within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 1, T31N, R1W, tributary to South Cow Creek.

A 2-inch pipeline diverts water from the spring about 0.8 mile northerly for domestic use at two houses on the Lucille Lansing Ranch.

Diversion 60 is the E. Hufford Ditch from the north side of South Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 35, T32N, R1W.

A rock and log dam 3 feet high and 35 feet long diverts a portion of the flow into a ditch 5 feet wide, 2 feet deep and about 1.4 miles long. About 1/2 mile below the head the ditch divides, one lateral continuing parallel to the creek on the north and the other crossing by flume to the south side of the creek. Ditch flow above the division and about 0.4 mile below the diversion point was at full ditch capacity of 9.6 cubic feet per second on May 28, 1964. On July 23, the flow was 7.7 cubic feet per second. Both laterals of the ditch irrigate a total of 119.0 acres of hay and pasture land on the Elmer Hufford Ranch.

Diversion 61 is the Rolands-Staiger Ditch from the north side of South Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 35, T32N, R1W.

A rock and log dam 2 feet high and 30 feet long diverts water into a ditch 4 feet wide and 1 foot deep. About 0.25 mile below the head the ditch divides into two laterals -- one continuing along the north side of the creek for irrigation of Rolands lands and the other lateral crossing by flume to the south side for irrigation of land on the Rolands and Staiger Ranches. Ditch flow just above the division point was 7.4 and 4.2 cubic feet per second on May 28 and July 23, 1964, respectively. Ditch capacity is about 7.5 cubic feet per second. From the point of division, the north lateral is about 0.5 mile long and the south lateral 1.75 miles long. Both laterals run very close to the corresponding branches of the E. Hufford Ditch (Diversion 60), and

several small flumes are required to carry water for the Rolands lands across the laterals of the E. Hufford Ditch. A section of the extreme end of the south lateral, which serves the Staiger Ranch, has been concrete lined to conserve water. The diversion irrigates a total of 44.2 acres of pasture on the Henry E. Rolands property and 33.6 acres of pasture on the J. Dana Staiger lands. The ditch right is reportedly divided 2/3 to Rolands and 1/3 to Staiger. The Staiger lands were not irrigated in 1964.

Diversion 62 is the E. Hufford Domestic Spring within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 3, T31N, R1W, tributary to South Cow Creek.

A 1-inch pipeline diverts water from the spring about 1 mile northerly where a pipe lateral branches off supplying domestic water to the Peter Hufford house south of the creek. The other branch of the pipeline conveys domestic water north about 1,000 feet across the creek to the Elmer Hufford house.

Diversion 63 is the Staiger Pump from the north side of South Cow Creek within the NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 33, T32N, R1W.

Diversion is by a piston type pump driven by a 3/4-horsepower electric motor. Suction lift is about 5 feet through a 1$\frac{1}{4}$-inch pipe and discharge lift is about 80 feet through a 1$\frac{1}{4}$-inch pipe. Rate of pump discharge is about 4 gallons per minute. An automatic float arrangement in the tank controls pump operation. About 300 feet of pipe conducts the water to a 1,000-gallon tank which furnishes pressure and storage for the place of use which consists of 1.0 acre of garden and orchard on the J. Dana Staiger property.

Diversion 64 is the South Cow Creek Powerhouse Ditch from the south side of South Cow Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 33, T32N, R1W. A rock fill dam 13 feet high and 90 feet long faced on the top and downstream side with 2-inch planks diverts water into a wooden and concrete headgate structure. The ditch is about 10 feet wide and 3 feet deep and is about 2.25 miles long to the forebay on the ridge top above the Pacific Gas and Electric Company's South Cow Creek Powerhouse. The plant was built in 1904.

About 0.25 mile below the diversion dam a spillway structure in the canal can be used to spill water back to the creek. The flow is measured by a 4-foot concrete Parshall flume a short distance below the ditch spillway. A water stage recorder maintains continuous records of discharge and a portion of the 1963-64 record is presented in Table B-10. During the 1963-64 water year ending September 30, 1964, 26,345 acre-feet were measured flowing past the recorder. Daily discharge varied from a maximum of 65 cubic feet per second on January 20 to a no-flow shutdown period of 4 days in May. During the low flow months of August and September 1964 an average of 13.5 cubic feet per second was passing through the ditch. Pertinent powerhouse features are given below:

Installed generating capacity	1,800 kilowatts
Maximum daily mean discharge of canal in 1963-64 water year (as measured by the Parshall flume)	65 cubic feet per second
Forebay capacity	5.4 acre-feet
Penstock size and length (one penstock)	30-inch steel pipe 3,706 feet long and 42-inch woodstave pipe 781 feet long
Static head	715 feet
Type of wheel	2 Pelton single overhung impulse wheels

The Mill Creek Ditch (Diversion 71) discharges into the pool behind the diversion dam and the combined flow from this source and South Cow Creek is diverted into the South Cow Creek Powerhouse Ditch.

The powerhouse is operated on base load and causes little fluctuation in flow below the tailrace which discharges into Hooten Gulch about 0.5 mile above the confluence of the gulch and South Cow Creek.

Leakage through the diversion dam and from the ditch which runs along the hillside parallel to the creek maintain a live stream in South Cow Creek in the reach between the diversion dam and Hooten Gulch.

Diversion 65 is the Neely Bear Gulch Ditch from the west side of Bear Gulch within the NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 17, T32N, R1E.

A rock and log dam 2 feet high and 3 feet long diverts water into an earth ditch about 2 feet wide and 1/2 foot deep. Capacity of the ditch is about 2.5 cubic feet per second. It conveys water about 700 feet to the place of use consisting of 22.1 acres of irrigated hay and pasture land on the Laurence C. Neely property just south of Tamarack Road. In 1964, 5.3 acres were not irrigated.

Flow in Bear Gulch during most of the irrigation season consists entirely of return flow from the Reimer, McTimmonds, and Shasta Forests Company lands irrigated by the German Ditch.

Diversion 66 is the Turk and Cook Ditch from the west side of an unnamed stream within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 20, T32N, R1E.

Diversion is by a low earth dam near the old Miller Sawmill log pond into a ditch about 2 feet wide and 1/2 foot deep. Capacity of the ditch is about 1 cubic foot per second. Flow available for diversion consists entirely of water from the German Ditch (Diversion 43) which is surplus to the needs and capacity of the system serving the Whitmore State Forestry Station. The ditch diverts the entire flow of the stream although there are several wooden spillways in the ditch which can spill surplus water back to the stream.

About 1,400 feet below the point of diversion a 3-inch pipe and a 2-inch pipe convey portions of the water northwesterly about 300 feet for gravity sprinkler irrigation of 2.7 acres of Christmas trees and garden. The ditch continues on a short distance where the remaining water is applied to about 1.5 acres of pasture. Total acreage irrigated is 4.2 acres on property owned by Ellen H. Turk and Roger D. Cook.

Diversion 67 is the Covey North Springs located in a group near the headwaters of Covey Creek within the NE$\frac{1}{4}$ and SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 23, and SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W. Combined flow of the springs is about 0.5 cubic foot per second.

The most southerly spring has been excavated and a pump installed which delivers domestic water through 100 feet of 3/4-inch pipe to the house just to the south on the Myrtle Jurdy Covey property. Water flowing from the spring group is controlled by small ditches which irrigate, together with water from Covey Main Spring (Diversion 68) 3.6

acres of pasture on the Harry N. Covey property, 8.2 acres of pasture on the Myrtle Jurdy Covey property, and 13.4 acres of pasture on the Paul Donohue property north of Whitmore Road.

Diversion 68 is the Covey Main Spring near the headwaters of Covey Creek within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 24, T32N, R1W.

A collecting ditch at the base of a springy area concentrates the flow at the diversion point where a box divides the water 2/3 to the Myrtle Jurdy Covey and Harry N. Covey properties to the north and 1/3 to Paul Donohue property to the west. The spring produces a developed flow of about 0.5 cubic foot per second.

A few feet below the division box the Myrtle Covey lateral divides again with one branch leading northwest for irrigation of a few acres of pasture on the south side of the Whitmore Road. The main Covey branch continues north across the Whitmore Road for irrigation of orchard and pasture on the Myrtle Covey property and pasture on the Harry Covey property adjoining to the west.

The Donohue lateral carries water westerly where it divides into a ditch and pipe irrigation system serving the pasture and orchard on the Donohue property on both sides of Whitmore Road.

The diversion irrigates 13.8 acres on the M. J. Covey property of which 5.4 acres were not irrigated in 1964; 3.6 acres on the Harry Covey property; and 6.6 acres on the Paul Donohue property. The Harry Covey and Donohue lands also receive supplemental water from Covey North Springs (Diversion 67). South of the Donohue property there are 5.9 acres irrigated on property of the Pacific Gas and Electric Company. Return flow from all of these springs collects in the Covey Creek.

Diversion 69 is the Covey Creek Ditch from the northwest side of Covey Creek within the NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 23, T32N, R1W.

An earth and rock dam 1 foot high and 6 feet long diverts water into a ditch 2 feet wide and 1/2 foot deep. On October 14, 1964, about 0.3 cubic foot per second was being diverted. Capacity is about 0.5 cubic foot per second. Water is conveyed about 800 feet to a small pond about 75 feet in length formed by an earth dam 4 feet high and 50 feet long. There is no outlet pipe through the dam. The water is used for stockwatering and subirrigation of 4.6 acres of pasture below the pond on the Henry J. Jungsten property.

Diversion 70 is the Bullard Pump from the south side of Mill Creek within the NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 28, T32N, R1W.

Water is diverted by a centrifugal pump driven by a 2-horsepower electric motor. Suction lift is about 7 feet through a 1$\frac{1}{2}$-inch pipe and discharge lift is about 33 feet through a 1$\frac{1}{4}$-inch pipe. Pump capacity is about 30 gallons per minute. About 150 feet of 1$\frac{1}{4}$-inch pipe convey the water to a storage tank and the place of use on the Harry E. Bullard property consisting of 2.0 acres of orchard and garden. This diversion supplements water supplied to the property from a well.

Diversion 71 is the Mill Creek Ditch from the southeast side of Mill Creek within the SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 28, T32N, R1W.

A concrete dam 2$\frac{1}{2}$ feet high and 35 feet long diverts water into an earth ditch about 5 feet wide and 2 feet deep. Water available

for diversion consists of water imported through the German Ditch under shares held by the Pacific Gas and Electric Company, plus the natural flow of Mill Creek and its tributary, Covey Creek. From May 14 to October 1 of 1964, the flow in Mill Creek available for diversion as measured at the Mill Creek Road, varied from 6.8 cubic feet per second to 5.6 cubic feet per second. On August 12, 1964, 1.4 cubic feet per second was entering Mill Creek via the German Ditch, indicating, by subtraction, that the natural flow of Mill Creek at the Mill Creek Road was 4.3 cubic feet per second on that day. Covey Creek contributes a constant flow of about 1 cubic foot per second to Mill Creek above the road. Capacity of the ditch is about 12 cubic feet per second.

The ditch is about 0.25 mile in length to its terminous in the pool in South Cow Creek created by the diversion dam for the South Cow Creek Powerhouse Ditch (Diversion 64). This dam diverts water from both sources - Mill Creek and South Cow Creek - for generation of power at the South Cow Creek Powerhouse owned by the Pacific Gas and Electric Company.

Diversion 72 is the Wagoner Ditch from the east side of the east channel of South Cow Creek above its confluence with the tailrace discharge from South Cow Creek Powerhouse in Hooten Gulch. The South Cow Creek channel divides into two branches a short distance upstream from this diversion point. The diversion is within NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 6, T31N, R1W. Measured ditch flow varied from the full ditch capacity of 0.85 cubic foot per second on June 25, 1964, to 0.77 cubic foot per second on August 31.

A concrete dam about 30 feet long and $3\frac{1}{2}$ feet high diverts water into an earth ditch about $2\frac{1}{2}$ feet wide and 6 inches deep. About 700 feet from the head of the ditch a concrete stilling tank is used to convey a portion of the water through about 1,400 feet of $2\frac{1}{2}$-inch steel pipe to the W. G. Wagoner house for domestic use. At the end of the ditch a portion of the water is conducted by 250 feet of $1\frac{1}{4}$-inch pipe easterly across Hooten Gulch and the Powerhouse Road to livestock barns and sheds for stock water use on the Wagoner ranch. The ditch is also used to flood irrigate 3.7 acres of pasture on the ranch just south of the concrete stilling tank. Of this total 1.3 acres were not irrigated in 1964.

Diversion 73 is the Abbott Ditch from the south side of the east channel of South Cow Creek within SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 6, T31N, R1W.

A concrete and flashboard dam 6 feet high and 30 feet long diverts the water into a ditch 7 feet wide and 2 feet deep. Water available for diversion consists principally of water discharged into Hooten Gulch through the South Cow Creek Powerhouse tailrace, although a small amount is also contributed by the eastern channel of South Cow Creek and return flow from lands irrigated by the Wagoner Ditch (Diversion 72).

Ditch flow in 1964 above the Pine Timber Gulch siphon and above all takeouts was as follows:

Date	Flow, in cubic feet per second
May 8	3.2
May 14	9.2
May 29	9.8
June 12	9.3
June 19	15.5*
July 14	11.7
July 27	15.3

* Full ditch capacity

Water entering the ditch is controlled by a headgate at the diversion dam and a second headgate just above the ditch siphon under Pine Timber Gulch. The ditch is about three miles long and provides irrigation water to five ranches. The following tabulation lists these ranches in downstream order and also shows the reported ditch rights and irrigated acreage on each.

Name	Reported ditch right	Irrigated acreage
Allan G. Abbott	8/16	96.0
Ellis T. Jones	1/16	14.6
Jesse C. Jones	1/16	13.4
V. R. Farrell	4/16	74.8
W. H. Hunt Estate Co.	2/16	112.9
	Total	311.7

The ditch follows the contour of the side hill and numerous laterals on the north ditch bank are used to flood irrigate the pasture and hay lands which lie between the ditch and South Cow Creek.

Diversion 74 is the Jennie Hufford Pump from the north side of South Cow Creek within the NE¼ of SW¼ of Section 11, T31N, R2W.

Water is diverted by a centrifugal pump driven by a small gasoline engine. Total lift is about 10 feet through a 2-inch intake pipe. Pump capacity is estimated to be 100 gallons per minute. The water is conveyed westerly through about 80 feet of 2-inch pipe to the place of use which consists of 0.4 acre of garden and orchard on the Jennie Hufford property.

Diversion 75 is the Hunt Pump from the south side of South Cow Creek within the NE¼ of NW¼ of Section 15, T31N, R2W.

Water is diverted by a 12-inch propeller type pump driven by a 20-horsepower electric motor. Total lift is about 12 feet through a 14-inch pipe. Pump discharge rate is 3,200 gallons per minute. The pump discharges directly into an earth ditch 7 feet wide and $1\frac{1}{2}$ feet deep which conveys the water southerly and then westerly along the perimeter of the irrigated land. The place of use contains three units totaling 30.2 acres of border-checked pasture on the W. H. Hunt Estate Company property.

Diversion 76 is for the Espinosa Pumps from the south side of Cow Creek within the SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 13, T31N, R3W.

A temporary earth and rock dam across the creek diverts a portion of the flow into an earth ditch about 30 feet long leading to a sump for the two pumps under this diversion.

Both centrifugal pumps are driven by $7\frac{1}{2}$-horsepower electric motors which lift the water about 13 feet through separate 5-inch intake pipes. On the discharge side of each pump the water is raised an additional 10 feet through 6-inch pipes. Rate of discharge of each pump is estimated to be 225 gallons per minute. The pumps irrigate 48.7 acres of pasture on the Harold C. Espinosa property of which 10.6 acres were not irrigated in 1964. The upper pump is used to irrigate the eastern and southern portions of the service area. The water draining from the eastern flood irrigated field collects in a pond near the lane leading to the ranch headquarters and is picked up by a third pump and applied by sprinklers to the southern field near State Highway 44. An additional 19 acres to the east were being prepared in 1964 for irrigation by construction of about 300 feet of 6-inch pipe and gravity ditch around this acreage.

The lower pump discharges into about 300 feet of wooden flume and then into a ditch for flood irrigation of the western portion of the service area on the Espinosa Ranch.

Diversion 77 is the Roberts Pump from the north side of Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 13, T31N, R3W.

In 1964 the pump was installed a few feet downstream from the confluence of Basin Hollow and Cow Creek. This centrifugal pump is driven by a portable gasoline engine. Suction lift is about 1 foot through a 1$\frac{1}{2}$-inch pipe and discharge lift is about 10 feet through a 1$\frac{1}{2}$-inch pipe. Pump capacity is about 50 gallons per minute. The diversion irrigates a garden about 30 feet by 15 feet adjacent to the creek on the David E. Roberts property.

Diversion 78 is the Hall South Pump from the south side of Cow Creek within the NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 13, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 10 feet through a 3$\frac{1}{2}$-inch pipe and discharge lift is about 18 feet through a 2-inch pipe. The pump discharges 104 gallons per minute while operating at a pressure of 64 pounds per square inch on the discharge line. A 5-inch aluminum sprinkler system is used to irrigate 32.1 acres of pasture adjacent to the creek on the Jura Lawrence Hall property.

Diversion 79 is the Hall North Pump from the north side of Cow Creek within the NW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 13, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 15-horsepower electric motor. Suction lift is about 7 feet through a 3$\frac{1}{2}$-inch

pipe and discharge lift is about 4 feet through a 2-inch pipe. Pump discharge was 229 gallons per minute while operating at a pressure of 56 pounds per square inch on the discharge line. A 5-inch sprinkler system is used to irrigate 22.5 acres of pasture adjacent to the creek on the Jura Lawrence Hall property.

Diversion 80 is the J. Hufford Pump from the south side of Cow Creek within the NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 14, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 15-horsepower electric motor. Capacity of the pump is about 1,200 gallons per minute. Suction lift is about 12 feet through a 12-inch pipe. Discharge lift is about 20 feet through a pipe varying from 8 to 12 inches. A 14-inch concrete pipe conducts the water south under State Highway 44 to 52 acres of border-checked pasture. Drainage from this field collects in a reservoir adjacent to the highway at the northwestern corner of the field. A gravity ditch system, including a pipe under the highway, conveys water from the reservoir north about 1,000 feet to an additional 19 acres of border-checked pasture. One branch of this ditch serves the pasture lying east of the old highway and one branch carries a portion of the water across the old highway to serve the west pasture. Water draining from the east pasture is also conducted under the highway and reused on the west pasture. There are 93.4 acres irrigated by this diversion system on the Jesse Hufford, Jr., property.

Diversion 81 is the Lynes Pump from the south side of Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 14, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 6 feet through a 3-inch pipe and discharge lift is about 6 feet through a 2-inch pipe. The capacity of the pump is about 250 gallons per minute. A 5-inch sprinkler system is used to irrigate 39.1 acres of pasture and alfalfa adjacent to the creek on the Ronald E. Lynes property. Of this total, 6 acres were not irrigated in 1964.

Diversion 82 is the Wetzel Pump from the north side of Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T31N, R3W, upstream from the old State Highway 44 bridge.

Water is diverted by a centrifugal pump driven by a 5-horsepower electric motor. Suction lift is about 7 feet through a 1$\frac{1}{2}$-inch pipe and discharge lift is about 15 feet through a 1$\frac{1}{4}$-inch pipe. Capacity is estimated to be 50 gallons per minute. A 4-inch sprinkler system is used to irrigate 15 acres of pasture on the Wesley Wetzel property just east of old State Highway 44.

Diversion 83 is the Meineken Pump from the north side of Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T31N, R3W, a short distance downstream from the old State Highway 44 bridge.

Water is diverted by a small gear-type pump driven by a gasoline engine. Suction lift is about 3 feet through a 2-inch pipe and discharge lift is about 15 feet through a 2-inch pipe. Pump capacity is about 60 gallons per minute. The pipe conducts the water about 350 feet northeasterly across the pasture irrigated by the Blomquist Pump (Diversion 84) to the place of use on the Elmer W. Roesner property. In 1964 the diversion system served only domestic needs at

the dwelling on the property. However, there are 2.0 acres of pasture which have been irrigated in the past.

Diversion 84 is the Blomquist Pump from the north side of Cow Creek within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 25-horsepower electric motor. Suction lift is about 7 feet through a 4-inch pipe, and discharge lift is about 12 feet through a 5-inch pipe. Capacity of the pump is 503 gallons per minute. A 5-inch sprinkler system is used to irrigate 36.3 acres of pasture adjacent to Cow Creek and west of State Highway 44, on the Theodore M. Blomquist property. About 1.3 acres of this total at the northern end of the field were not irrigated in 1964.

Diversion 85 is the Bishop Pump from the south side of Cow Creek south of Millville within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 14, T31N, R3W.

Water is diverted by a portable pump driven by a small gasoline engine. Suction lift is about 20 feet through a 1$\frac{1}{2}$-inch plastic pipe and discharge lift is about 20 feet through a 2-inch steel pipe. Pump capacity is about 50 gallons per minute. About 100 feet of 2-inch pipe convey the water to the place of use which was under development. In 1964 the diversion irrigated 0.3 acre of garden on the Jack Bishop property.

Diversion 86 is the Junkans South Pump from the south side of Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 10, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 5-horsepower electric motor. Suction lift is about 15 feet through a 6-inch pipe and discharge lift is about 7 feet through a 6-inch pipe. Pump discharge rate is 490 gallons per minute. A 10-inch buried concrete pipe conducts the water southwesterly about 500 feet to a ditch which is used to irrigate 29 acres of border-checked pasture on the Elmer W. Junkans property adjacent to the creek.

Diversion 87 is the Junkans North Pump from the north side of Cow Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 10, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 20-horsepower electric motor. Suction lift is about 6 feet through a 4-inch pipe. Discharge lift is about 20 feet through a 6-inch pipe. The discharge rate is 326 gallons per minute at a pressure of 33 pounds per square inch on the discharge line. The water is conducted north through about 1,300 feet of buried 6-inch pipe for sprinkler irrigation of 40.6 acres of pasture on the Elmer W. Junkans property.

Diversion 88 is the Bingham Pump from the north side of Cow Creek within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 10, T31N, R3W, about 100 feet upstream from the Bingham Domestic Pump (Diversion 89).

This diversion has been abandoned and all that remained in 1964 was an old V-shaped wooden flume which at one time conveyed water from the pump north to the place of use consisting of 11 acres of pasture on the B. C. Bingham property.

Diversion 89 is the Bingham Domestic Pump from the north side of Cow Creek within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 10, T31N, R3W.

The $1\frac{1}{2}$-inch centrifugal pump at this diversion has been abandoned and no water was diverted in 1964. Total lift was about 25 feet. About 300 feet of 3/4-inch steel pipe conveyed the water to the house on the B. C. Bingham property for domestic use.

Diversion 90 is the Tuttle Pump from the north side of Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 9, T31N, R3W.

Water is diverted by a centrifugal pump with 8-inch intake and discharge lines. The pump is driven by a 15-horsepower electric motor. Total suction lift is about 10 feet. Discharge rate is 1,240 gallons per minute. A 14-inch concrete buried pipe system is used to irrigate 119.6 acres of border-checked pasture on the Carl F. Tuttle, Jr., property. In 1964, 43.6 acres normally irrigated were idle.

Diversion 91 is the Shufelberger Pump from the south side of Cow Creek within the SE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 9, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 15 feet through a 6-inch pipe and discharge lift is about 20 feet through a 6-inch pipe. Pump capacity is about 700 gallons per minute. The water enters either an irrigation system consisting of 6-inch steel pipe for irrigation of border-checked fields adjacent to the pump on the east and west side, or the main system consisting of about 4,000 feet of 14-inch concrete pipe running generally through the center of the irrigated fields parallel to Cow Creek. The diversion irrigates 98.6 acres of border-checked pasture on the Vern Shufelberger property. In 1964, 16 acres of pasture were idle.

Diversion 92 is the Schulz Pump from the north side of Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 9, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. The suction lift is about 7 feet through an 8-inch pipe and discharge lift is about 15 feet through about 30 feet of 8-inch pipe. Capacity of the pump is estimated to be 1,000 gallons per minute. A ditch and border-checked irrigation system is used to irrigate 31.4 acres of pasture on the Walter P. Schulz property lying within the angle formed by the junction of Oak Run Creek and Cow Creek. This diversion was not used during 1964.

Diversion 93 is the Frisbie Pump from the south side of Cow Creek just above its junction with Oak Run Creek within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 9, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 17 feet through a 5-inch pipe and discharge lift is about 2 feet through a 4-inch pipe. Pump discharge is estimated to be 300 gallons per minute. The water is conveyed by ditch to 19 acres of border-checked irrigated pasture on the E. C. Frisbie property.

Diversion 94 is the Otten Pump from the east side of Cow Creek within the NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 8, T31N, R3W, a short distance downstream from Silverbridge Road.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 12 feet through a 4-inch pipe and discharge lift is about 10 feet through a 2$\frac{1}{2}$-inch pipe. Pump

discharge rate is 153 gallons per minute. About 400 feet of 6-inch pipe and 900 feet of 4-inch buried pipe are coupled to a sprinkler system for irrigation of 23 acres of pasture on the Alex J. Otten property.

Diversion 95 is the Leggett Pump from the east side of Cow Creek within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 8, T31N, R3W.

Water is diverted by a turbine pump driven by a 20-horsepower electric motor. The pump is installed in a 4-foot diameter vertical concrete sump about 50 feet from the creek bank. The lift to the pump discharge elbow is about 13 feet and the discharge lift is about 14 feet through a 12-inch pipe. Pump capacity is estimated to be 1,800 gallons per minute. Water is discharged into a buried irrigation pipe which runs easterly across the north pasture to Silverbridge Road and then into a ditch that runs south parallel to the road. Water may also be discharged into a ditch about 4 feet wide and 1 foot deep which runs south through pasture land parallel to the creek.

The new State Highway 44, completed in 1964, passes through the middle of the ranch but no facilities have been built to carry the ditches across it to the southerly portion of the place of use. Irrigation of these fields would require a new pump in Cow Creek south of the new highway bridge.

The place of use under the old irrigation system before the new highway was built consisted of 176.6 acres of irrigated pasture and general crops on the Howard M. Leggett property. In 1964, only 56.8 acres of pasture north of the highway were irrigated.

Remnants of the abandoned Big Cow Creek Ditch which served this ranch and others until about 1943 can be seen leading into the property from the east. This ditch crossed the ranch and a portion of the water was carried across Cow Creek by flume about 1,000 feet downstream from the present Leggett Pump.

Use of water on the ranch is covered under licenses issued on Applications 237 and 14586 which are explained in more detail in Appendix C.

Diversion 96 is the Fraley North Pump from the east side of Cow Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 17, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 6 feet through an 8-inch pipe and discharge lift is about 20 feet through 30 feet of 6-inch pipe when pumping for irrigation of the pasture on the northerly bench. A 12-inch pipe and gravity ditch conduct the water to the north pasture which is irrigated by border checks. When pumping into the ditch leading to the south pasture the discharge lift is only about 12 feet. Measured pump discharge was 740 gallons per minute when irrigating the south pasture. Drainage from the south fields collects in a sump located at the southeast corner where a sump pump lifts the water into two ditches which are used to irrigate by border checks two fields containing 15 acres. There are 54.6 acres of pasture, alfalfa and sudan grass irrigated by this diversion system on the Harold L. Fraley property.

Diversion 97 is the Dicker Reservoir on an unnamed stream west of Deschutes Road within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 18, T31N, R3W.

An earth dam 24 feet high and 275 feet long across the stream stores winter runoff in the reservoir which has a capacity of 25 acre-feet. Height of the dam from stream channel to spillway is 22.5 feet. There is no outlet pipe.

The reservoir is used for recreational and stockwatering purposes and for irrigation of 1 acre of shade trees and pasture near the reservoir. It is owned by C. M. Dicker, Inc. A portable pump powered by a gasoline engine lifts water from the reservoir into a 2-inch pipe and sprinkler system. Storage is covered by water right Application 19280 which is described in Appendix C.

Diversion 98 is the Harris Pump from the west side of Cow Creek within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 17, T31N, R3W.

Water is diverted by a portable pump driven by a small gasoline engine. Total lift is about 23 feet through a 1$\frac{1}{2}$-inch intake pipe and 1-inch plastic discharge pipe. Pump capacity is about 30 gallons per minute. The pump irrigates 1 acre of orchard, garden, and lawn near the dwelling on the John M. Harris property.

Diversion 99 is the Fraser Pump from the west side of Cow Creek within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 17, T31N, R3W.

Water is diverted by a centrifugal pump driven by a portable gasoline engine which develops about 10-horsepower. Suction lift is about 6 feet through a 5-inch pipe and discharge lift is about 18 feet

through a 4-inch pipe. Pump discharge rate is about 600 gallons per minute. The pump discharges into a 12-inch wide wooden flume about 100 feet long for use on the Thomas Fraser property. This development is new, and no crop had been planted or irrigated in 1964. About 6 acres are under development.

Diversion 100 is the Fraley South Pump from the east side of Cow Creek within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 17, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 15 feet through an 8-inch pipe and discharge lift is about 12 feet through an 8-inch pipe. Capacity is estimated to be 600 gallons per minute. About 750 feet of 12-inch concrete pipe conveys the water east through the center of the irrigated pasture. A ditch system is then used to irrigate the pasture by border checks and about 2 acres of olive trees all on the Harold L. Fraley property. This diversion normally irrigates 13 acres. However, the diversion was not used during 1964.

Diversion 101 is the Maynard Pump from the west side of Cow Creek within the SW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 20, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 20-horsepower electric motor. Suction lift is about 8 feet through an 8-inch pipe and discharge lift is about 25 feet through 50 feet of pipe varying from a 6-inch to a 12-inch diameter. The measured discharge rate of the pump is 800 gallons per minute. A 14-inch concrete pipe conducts the water southwesterly under Deschutes Road to the place

of use consisting of 48.4 acres of border-checked pasture on the R. and E. D. Maynard property. In 1964 the northerly 24.0 acres were not irrigated.

Diversion 102 is the Kirkman Pump from the west side of Cow Creek within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W.

This diversion system has been abandoned and the former irrigated pasture owned by Lawrence and Marie Kirkman and served by the pump has been subdivided into 9 small parcels. The new owners are listed below together with acreage formerly irrigated by this pump and acreage now irrigated by different diversions.

Name	Acreage formerly irrigated by Kirkman Pump	Acreage now irrigated by other diversions	Diversion Number
R. Glassford	2.2	0.6	103
P. Carter	2.5	0.5	104
C. McKee	5.0	0.4	104
J. Cherta	4.2		
J. Johnson	1.0		
J. Robinson	5.0		
W. Clark, et al.	16		
M. Zeis	4.9		
A. Morse	10.0	10.0	106
Total	50.8	11.5	

In 1960 a centrifugal pump driven by a 15-horsepower electric motor was in place at the point of diversion. It discharged into about 200 feet of 10-inch iron pipe for irrigation by border checks of 51 acres of pasture south of the pump and adjacent to the creek. Several of the new parcels created by the subdivision are served water by new diversions from the creek as shown in the tabulation above. However, most of the former place of use was not irrigated during 1964.

Diversion 103 is the Glassford Pump from the west side of Cow Creek within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 1$\frac{1}{2}$-horsepower electric motor. Suction lift is about 3 feet through a 1$\frac{1}{2}$-inch pipe and discharge lift is about 20 feet through a 1$\frac{1}{4}$-inch pipe. Pump discharge rate is about 30 gallons per minute. About 150 feet of 1$\frac{1}{4}$-inch pipe conveys the water to the place of use consisting of 0.6 acre of garden on the Roy Glassford property. Diversion 102 formerly served this property.

Diversion 104 is the Carter-McKee Pump from the west side of Cow Creek within the NE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W.

Water is diverted by a centrifugal pump driven by a small gasoline engine. Suction lift is about 8 feet through a 2-inch pipe and discharge lift is about 10 feet through a 2-inch pipe. Pump discharge rate is about 50 gallons per minute. About 100 feet of 3-inch pipe carries the water to the place of use. In 1964, the place of use consisted of 0.5 acre of garden on the Paul L. Carter property and 0.4 acre of garden on the Charles N. McKee property adjoining on the south. An informal rotation system is practiced by the two owners. Diversion 102 formerly served this property.

Diversion 105 is the Stone-Fitzpatrick Pump from the east side of Cow Creek within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Intake and discharge pipes are 8-inch. Suction lift is about 3 feet and static lift above the pump is about 30 feet.

Measured discharge rate of the pump is 985 gallons per minute. The water is pumped into about 1,000 feet of 14-inch underground pipe. The system irrigates by border check 11.4 acres of pasture on the S. C. Stone property and 43.5 acres of pasture on the contiguous David P. Fitzpatrick property. Water from this pump also irrigates about 0.3 acre of orchard on the Fitzpatrick property just east of the pump.

Application 17636 is on file with the State Water Rights Board to cover this diversion and details are set forth in Appendix C. The water right permit is owned 4/5 by Fitzpatrick and 1/5 by Stone and rotation in use of water is practiced by the owners in this proportion. The water is turned north to Stone and south to Fitzpatrick at a point about 1,000 feet east of the pump at the eastern edge of the service area.

Diversion 106 is the Morse Pump from the west side of Cow Creek within the SE¼ of SW¼ of Section 20, T31N, R3W.

The pump and motor have been removed and all that remained at the point of diversion in 1964 were the electrical service and meter.

The place of use on the Alvin Morse property consisted of pasture adjacent to the creek and garden and orchard west of the house totaling 10 acres. At one time this land was also irrigated from Diversion 102.

Diversion 107 is the A. F. Hufford Pump on the east side of Cow Creek within the NE¼ of NW¼ of Section 29, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 3 feet through an 8-inch pipe and discharge lift is about 20 feet through 220 feet of pipe varying

from 8 to 12 inches in diameter. Measured capacity of the pump is 1,180 gallons per minute. The water enters a ditch system which irrigates 32.7 acres of pasture west of Silverbridge Road on the Albert F. Hufford property through border checks. Three small orchards totaling 0.7 acre and a lawn near the ranch headquarters south of a gulch, tributary from the east, are also irrigated.

Application 12138 is on file with the State Water Rights Board for this diversion system. Details of the appropriation are given in Appendix C.

Diversion 108 is the Herman Pump from the west side of Cow Creek within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 29, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 15-horsepower electric motor. Suction lift is about 10 feet through a 4-inch pipe and dishcarge lift is about 15 feet through a 4-inch pipe. Pump capacity is estimated to be 300 gallons per minute. The pump discharges into a 5-inch sprinkler system which irrigates pasture land as set forth below:

Name	Irrigated acreage
William F. Herman	39
North Valley Title and Escrow Company	5.0
Jerry W. Tippin	2.5
Margot Hoffman	2.5
Total	49.0

During 1964, 12.8 acres of pasture normally irrigated on the Herman property were not irrigated.

Diversion 109 is the Swoboda Brothers Pump from the west side of Cow Creek within the NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 29, T31N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 11 feet through a 6-inch pipe and discharge lift is about 15 feet through a 6-inch pipe. Pump capacity is estimated to be 700 gallons per minute. The water is conducted westerly through about 400 feet of 12-inch pipe and then discharged into a ditch which runs south for about 1,300 feet through the center of the John F. Swoboda property. Near the pump the water may be turned into a ditch which runs south for about 1,100 feet for irrigation of the Lawrence J. Swoboda property adjacent to the creek. The two ranches share in the diversion equally by rotation.

The place of use on the John F. Swoboda property consists of 24.2 acres of border-checked pasture, walnuts and grain. Only 13.2 acres of this total were irrigated in 1964. On the Lawrence J. Swoboda property 14 acres of border-checked pasture are irrigated.

Application 11695 has been filed with the State Water Rights Board and covers a portion of this use. It is explained in more detail in Appendix C.

Diversion 110 is the Pearson Pump on the east side of Cow Creek within the SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 29, T31N, R3W.

Water is diverted by a pump driven by a 15-horsepower electric motor. Lift from water surface to pump discharge elbow is about 20 feet. Measured capacity of the pump is 1,540 gallons per minute. The water is delivered through a 12-inch pipe to a 16-inch pipe system for irrigation of border-checked pasture. Drainage collects in an excavated sump about 40 by 125 feet in area located near the southeast corner of this field.

A sump pump driven by a 30-horsepower electric motor pumps the water through a 5-inch pipe and discharges it into a sprinkler system for irrigation of a large area of pasture adjoining the border-checked field on the south and east. The diversion system irrigates a total of 209.6 acres on the Glenn Pearson property and 2.2 acres of Tal E. Murphy property adjacent to the creek.

Application 11528 is on file with the State Water Rights Board and covers a portion of this use. It is explained in more detail in Appendix C.

Diversion 111 is the Beatie Pump from the west side of Cow Creek within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 5, T30N, R3W.

Water is diverted by a centrifugal pump driven by a 10-horsepower electric motor. Suction lift is about 10 feet through a 10-inch pipe and discharge lift is about 18 feet through an 8-inch pipe. Capacity is estimated to be 900 gallons per minute. A gravity ditch system irrigates 66.8 acres of border-checked pasture on the Arthur H. Beatie property. Of this acreage about 19.8 acres were not irrigated during 1964.

Diversion 112 is the Beatie Stock Water Pump from the west side of Cow Creek, a few feet downstream from the Beatie Pump (Diversion 111) within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 5, T30N, R3W.

Water is diverted by a jet pump driven by a 1/2-horsepower electric motor. Water is lifted to the pump about 24 feet. The water is conveyed through about 500 feet of 3/4-inch plastic pipe in a southwesterly direction to a stockwatering tank in the pasture. Pump discharge rate is about 5 gallons per minute.

Diversion 113 is the Bryant Pump from the east side of Cow Creek within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 5, T30N, R3W.

Water is diverted by a centrifugal pump driven by a 30-horsepower electric motor. Suction lift is about 5 feet through a 5-inch pipe and discharge lift is about 18 feet through an 8-inch pipe. Pump capacity is estimated to be 800 gallons per minute. The water can be conveyed north through 2,200 feet of 8-inch pipe for sprinkler irrigation of 33 acres of pasture planted during the summer of 1964. An additional 41.6 acres of pasture are under development. The pump also irrigates 7.2 acres of mixed orchard trees south of the pump. The property is owned by William J. Bryant, et al.

Diversion 114 is the proposed R. Hawes West Pump from the west side of Cow Creek within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 5, T30N, R3W.

During 1964, 104.8 acres adjacent to the creek and north of Dersch Road were being leveled and prepared for irrigated pasture on the Roy Hawes property. The pump will supply water to this land and an additional 10.4 acres of formerly irrigated pasture adjacent to the creek.

Diversion 115 is the R. Hawes East Pump from the east side of Cow Creek just north of Dersch Road within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 5, T30N, R3W.

The pump has been removed but formerly irrigated 13 acres of pasture, garden, and orchard adjacent to the creek on the Roy Hawes property.

Diversion 116 is the M. Hawes Pump from the west side of Cow Creek just below Dersch Road Bridge within the NW$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T30N, R3W. It is the lowermost diversion from Cow Creek.

Water is diverted by a centrifugal pump driven by a 30-horsepower electric motor. The 12-inch suction pipe lifts the water about 10 feet. On the discharge side of the pump, a 12-inch pipe under a static head of about 10 feet discharges the water into a buried 16-inch concrete pipe irrigation system. The measured pump discharge rate is 2,400 gallons per minute. The diversion irrigates, by border checks, 58 acres of hay and pasture land on the Melvin Hawes property. About 1 acre of berries near the pump is also irrigated. The south field containing 61.6 acres was not irrigated in 1964.

Backwater from the Sacramento River is present in Cow Creek at this diversion point during most of the irrigation season. Thus, the water available for diversion consists of a mixture of water from Cow Creek and the Sacramento River.

APPENDIX B

RECORDS OF WATER SUPPLY AND USE OF WATER

TABLE B-1

DAILY MEAN DISCHARGE OF COW CREEK
AT U. S. GEOLOGICAL SURVEY STATION*

May 1 to September 30, 1964

(In cubic feet per second)

Day	May	June	July	August	September
1	248	116	30	11	34
2	242	114	27	7.6	45
3	277	108	28	12	38
4	304	108	31	9.8	31
5	255	112	33	9.2	27
6	233	114	30	7.0	25
7	211	154	22	7.0	19
8	211	160	19	7.6	19
9	211	261	20	12	17
10	208	322	21	12	16
11	191	224	17	7.6	18
12	183	174	17	8.2	18
13	199	150	18	7.0	19
14	202	137	16	5.3	14
15	191	122	14	3.7	11
16	191	112	15	4.8	7.6
17	191	106	15	6.5	9.8
18	183	90	14	8.7	12
19	180	89	18	6.5	16
20	174	82	17	4.4	17
21	164	78	12	6.1	12
22	157	73	12	5.7	7.0
23	150	52	9.8	7.0	4.8
24	137	46	13	5.3	4.1
25	134	26	14	2.9	5.7
26	141	37	13	2.0	9.2
27	157	34	13	2.0	16
28	188	42	9.8	2.9	17
29	160	38	13	5.3	18
30	148	33	17	8.2	19
31	128		13	11	
Mean	192	110	18.1	6.98	17.5
Runoff in acre-feet	11,806	6,545	1,113	429	1,041

Total for period - 20,934 acre-feet

*Provisional record

TABLE B-2

DAILY MEAN DISCHARGE OF GLENDENNING CREEK
BELOW CONFLUENCE WITH BEAR GULCH

May 1 to October 12, 1964

(In cubic feet per second)

Day	May	June	July	August	September	October
1	19.8	10.3	7.7	3.3*	6.7	4.7
2	16.4	10.3	6.7	3.3*	6.1	4.4
3	19.3	9.9	6.7	3.4*	5.5	4.2
4	16.4	9.9	7.1	3.5*	5.5	4.4
5	16.9	9.9	6.7	3.5*	5.3	4.2
6	15.5	11.9	6.1	3.6*	3.9	4.7
7	14.6	12.3	5.8	3.7	2.7	5.3
8	14.1	15.5	6.1	3.7	3.9	5.3
9	14.1	19.3	5.5	3.7	3.4	5.0
10	13.2	15.5	5.0	3.9	3.7	5.3
11	11.9	13.6	5.0	3.7	3.7	4.7
12	11.1	12.3	3.9	3.2	3.2	4.4
13	11.9	11.9	3.7	3.2	3.2	
14	11.9	11.1	3.9	3.2	2.5	N
15	13.6	11.5	4.2	2.5	2.7	O
16	14.1	10.3	3.9	2.3	3.2	
17	13.6	9.9	3.9	2.3	3.7	R
18	14.6	9.5	3.9	2.3	3.4	E
19	13.6	9.1	3.7	2.7	3.2	C
20	13.2	9.1	3.7	3.0	3.9	O
						R
21	14.1	8.8	3.7	3.2	4.2	D
22	13.2	8.4	3.7	3.7	4.7	
23	13.2	7.7	3.2	3.9	4.7	
24	11.9	7.7	3.4	3.2	4.7	
25	12.3	7.4	3.7	3.7	4.2	
26	14.1	6.7	3.2	3.9	4.2	
27	17.9	6.1	3.0	4.4	4.7	
28	15.5	7.1	3.1*	3.9	5.3	
29	14.1	8.1	3.2*	3.7	5.3	
30	12.3	8.1	3.2*	3.9	4.7	
31	11.1		3.2*	4.4		
Mean	14.2	10.3	4.5	3.4	4.2	4.7
Runoff in acre-feet	873	613	273	209	250	112

Total for period - 2,330 acre-feet

*Estimated

TABLE B-3

DAILY MEAN DISCHARGE OF SOUTH COW CREEK
ABOVE GERMAN DITCH

June 12 to October 12, 1964

(In cubic feet per second)

Day	June	July	August	September	October
1		23	19.5	18.9	16.7
2	N	23	19.5	16.7	16.7
3	O	23	18.9	15.7	16.7
4		23	18.9	16.7	16.7
5	R	22	18.3	16.7	16.7
	E				
6	C	22	18.3	16.7	16.7
7	O	22	18.3	16.7	16.7
8	R	22	18.9	16.7	17.3
9	D	22	18.9	16.7	16.7
10		22	18.3	16.3	16.7
11		22	18.3	16.3	16.7
12	33	22	18.9	16.3	16.7
13	32	22	18.9	15.7	
14	31	22	18.9	16.3	N
15	30	22	18.9	15.7	O
16	30	21	18.3	15.7	R
17	29	21	18.3	15.7	E
18	28	21	18.3	16.3	C
19	27	20	18.3	16.7	O
20	26	20	18.3	16.7	R
					D
21	26	20	18.3	16.7	
22	26	20	18.3	17.3	
23	26	20	18.3	16.7	
24	25	20	18.3	16.7	
25	24	20	18.3	16.7	
26	24	19.5	17.8	17.3	
27	24	19.5	17.8	17.3	
28	24	19.5	17.8	17.3	
29	23	20.1	17.3	17.3	
30	23	19.5	14.8	16.7	
31		19.5	14.8		
Mean	26	21	18.2	16.6	16.8
Runoff in acre-feet	980	1,291	1,119	988	400

Total for period - 4,778 acre-feet

TABLE B-4

DAILY MEAN DISCHARGE OF ATKINS CREEK
AT BATEMAN ROAD

May 15 to October 12, 1964

(In cubic feet per second)

Day	May	June	July	August	September	October
1		13.9	4.3	2.1	3.1	2.0
2	N	13.6	4.1	2.1	3.1	2.0
3	O	13.3	3.9	2.0	3.2*	2.0
4		13.0	3.7	2.0	3.1	2.0
5	R	12.7	3.5	1.9	3.1	2.0
	E					
6	C	12.5	3.3	1.9	3.0	2.0
7	O	12.2	3.2	1.8*	2.9	2.0
8	R	11.9	3.0	1.8	2.8	2.0
9	D	11.6	2.8	1.9	2.8	2.0
10		11.3	2.6*	1.9	2.7	2.0
11		11.0*	2.7	2.0	2.6	2.0
12		10.5	2.8	2.0	2.5	2.0*
13		10.1	3.0	2.1	2.5	
14		9.6	3.1	2.1	2.4	N
15	18.9*	9.1	3.2*	2.1	2.3	O
16	18.6	8.6	3.1	2.2	2.3	R
17	18.3	8.2	3.1	2.2	2.2	E
18	18.0	7.7	3.0	2.3	2.1*	C
19	17.7	7.2*	2.9	2.3	2.1	O
20	17.4	6.9	2.9	2.4	2.1	R
						D
21	17.1	6.6	2.8	2.4*	2.1	
22	16.8	6.3	2.7	2.5	2.1	
23	16.6	6.1	2.7	2.5	2.1	
24	16.3	5.8	2.6*	2.6	2.1	
25	16.0	5.5	2.5	2.6	2.1	
26	15.7	5.2*	2.5	2.7	2.1	
27	15.4	5.0	2.4	2.8	2.1	
28	15.1	4.8	2.4	2.8	2.1	
29	14.8	4.6	2.3	2.9	2.1	
30	14.5	4.5	2.3	3.0	2.1	
31	14.2		2.2	3.0		
Mean	16.6	9.0	3.0	2.3	2.5	2.0
Runoff in acre-feet	560	536	184	141	149	48

Total for period - 1,618 acre-feet

*Staff gage read this day. Values for all other days are interpolated.

TABLE B-5

DAILY MEAN DISCHARGE OF MILL CREEK
AT MILL CREEK ROAD

May 14 to October 1, 1964

(In cubic feet per second)

Day	May	June	July	August	September	October
1		6.4	5.9	5.7	5.7	6.1*
2	N	6.3	5.9	5.7	5.7	N
3	O	6.3	5.9	5.7*	5.7*	O
4		6.3*	5.8	5.7	5.7	
5	R	6.3	5.8	5.7	5.7	R
	E					E
6	C	6.3	5.8	5.7	5.8	C
7	O	6.3	5.8	5.7*	5.8	O
8	R	6.2	5.8	5.7	5.8	R
9	D	6.2	5.8	5.7	5.8	D
10		6.2	5.8*	5.7	5.9	
11		6.2*	5.8	5.7	5.9	
12		6.1*	5.7	5.7	5.9	
13		6.1	5.7*	5.7	6.0	
14	6.8*	6.0	5.6	5.7	6.0	
15	6.8	6.0*	5.6	5.7	6.0	
16	6.8	6.1*	5.6	5.7	6.0	
17	6.7	6.0	5.6	5.7	6.1	
18	6.7	5.9	5.6	5.7	6.1*	
19	6.7	5.8*	5.6	5.7	6.1	
20	6.7	5.8	5.7	5.7	6.1	
21	6.6	5.8	5.7	5.7*	6.1	
22	6.6	5.8	5.7	5.7	6.1	
23	6.6	5.9	5.7	5.7	6.1	
24	6.6	5.9	5.7*	5.7	6.1	
25	6.5	5.9	5.7	5.7	6.1	
26	6.5	5.9*	5.7	5.7	6.1	
27	6.5	5.9	5.7	5.7	6.1	
28	6.5	5.9	5.7	5.7	6.1	
29	6.4	5.9	5.7	5.7	6.1	
30	6.4	5.9	5.7	5.7	6.1	
31	6.4		5.7*	5.7		
Mean	6.6	6.1	5.7	5.7	6.0	6.1
Runoff in acre-feet	236	363	350	350	357	12

Total for period - 1,668 acre-feet

*Staff gage read this day. Values for all other days are interpolated.

TABLE B-6

DAILY MEAN DISCHARGE OF SOUTH COW CREEK
AT U. S. GEOLOGICAL SURVEY STATION*

May 1 to September 30, 1964

(In cubic feet per second)

Day	May	June	July	August	September
1	82	39	18	10	18
2	70	36	19	13	18
3	73	32	17	11	16
4	70	33	18	12	16
5	66	34	18	11	14
6	64	37	17	12	14
7	62	43	16	11	13
8	62	44	15	12	12
9	59	65	14	13	9.5
10	60	68	14	12	10
11	58	52	16	12	11
12	56	44	16	10	12
13	62	39	14	8.6	12
14	64	38	12	8.2	5.9
15	64	32	14	10	8.2
16	62	33	14	10	11
17	64	32	12	11	11
18	60	30	12	10	12
19	58	30	12	12	12
20	54	30	14	12	10
21	48	26	15	12	9.0
22	48	20	14	12	9.0
23	46	20	16	12	8.2
24	45	18	14	10	8.6
25	44	20	15	10	10
26	48	19	15	10	10
27	52	20	14	8.6	11
28	58	20	14	10	13
29	48	19	14	8.6	13
30	44	19	9.5	9.5	12
31	40		6.8	13	
Mean	57.8	33.1	14.5	10.9	11.6
Runoff in acre-feet	3,554	1,970	891	667	693

Total for period - 7,775 acre-feet

*Provisional record

TABLE B-7

DAILY MEAN DISCHARGE OF COW CREEK BELOW
CONFLUENCE OF OLD COW AND SOUTH COW CREEKS

April 30 to October 12, 1964

(In cubic feet per second)

Day	April	May	June	July	August	September	October
1		206	112	44	16.3	51	28
2		188	109	45	17.5	51	23
3		206	101	44	17.5	47	15.0
4		182	101	44	20	32	14.0
5		175	106	42	15.0	27	15.0
6		172	109	38	16.3	24	18.8
7		170	136	33	11.6	27	24
8		172	141	30	11.6	24	27
9		177	216	35	15.0	16.3	27
10	N	180	201	32	16.3	21	24
	O						
11		172	165	27	20	23	25
12	R	172	146	32	17.5	24	24
13	E	180	133	35	12.7	18.7	
14	C	175	125	30	11.6	20	
15	O	172	109	28	11.6	16.3	N
	R						O
16	D	172	109	32	11.6	17.5	
17		175	106	32	15.0	20	R
18		172	96	28	16.3	24	E
19		170	91	27	15.0	20	C
20		159	91	27	15.0	20	O
							R
21		152	83	27	15.0	17.5	D
22		146	71	20	16.3	16.3	
23		139	64	24	11.6	11.6	
24		131	60	21	12.7	17.5	
25		131	57	20	9.5	21	
26		133	55	24	10.5	20	
27		159	49	20	16.3	27	
28		170	57	26	15.0	32	
29		141	55	30	11.6	28	
30	183	125	47	23	13.8	27	
31		117		11.6	23		
Mean	183	164	103	30	14.8	25	22
Runoff in acre-feet	363	10,084	6,129	1,845	910	1,488	524

Total for period - 21,343 acre-feet

TABLE B-8

MISCELLANEOUS MEASUREMENTS OF STREAM FLOW

1964

Stream	Location of measurement	Date	Discharge in cubic feet per second
West Hunt Creek*	At One Road	Oct. 13	1*
Old Cow Creek	At Ponderosa Way	June 25	2.6
		July 10	1.4
		July 14	1.3
		July 24	0.9
		Aug. 7	1.4
		Aug. 21	0.6
		Sept. 1	6.5
		Sept 18	1.5
		Oct. 1	1.6
Old Cow Creek	Below Kilarc Power-house	June 25	44 **
		July 10	36 **
		July 14	35 **
		July 24	31 **
		Aug. 7	29 **
		Aug. 21	27 **
		Sept. 1	32 **
		Sept. 18	26 **
		Oct. 1	26 **
Dailey Creek	At Tamarack Road	June 16	2.04
		June 17	2.04
		June 26	1.00
		July 10	0.5
		July 14	0.95
		July 24	0.95
		Aug. 7	1.2
		Aug. 21	1.2
		Sept. 1	1.52
		Sept. 18	1.93
		Oct. 1	1.8
Bear Gulch	At Tamarack Road	June 6	1.53
		June 26	1.3
		July 10	0.20
		July 14	0.13
		July 24	0.3
		Aug. 7	0.3
		Aug. 21	0.5
		Sept. 1	2.37
		Sept. 18	0.6
		Oct. 1	0.8

* Estimated
** Computed

TABLE B-8 (contd.)

Stream	Location of measurement	Date		Discharge in cubic feet per second
Fern Spring Channel	Above confluence with Old Cow Creek	Apr.	22	0.1 *
		June	4	0.01*
		July	10	0.01*
Beal Creek	Above Beal Creek Ditch	Aug.	26	6*
Hagaman Gulch	At Ponderosa Way	Apr.	22	0
		June	15	0
Hamp Creek	Above confluence with South Cow Creek	June	16	0.05*
Covey Creek	At confluence with Mill Creek	June	4	1*
South Cow Creek	At Ponderosa Way	May	13	72
		Sept.	23	10*
South Cow Creek	Above Wagoner Ditch	June	25	5.7*
		July	14	4.5*
		Sept.	23	5*
		Sept.	30	5.1
Basin Hollow	At confluence with Cow Creek	May	14	0.2*
		May	29	0.6*
		July	13	0.17
		Aug.	21	0
		Aug.	31	0
		Sept.	4	0
		Sept.	18	0.02*
		Oct.	12	0.1*
Cow Creek	Below confluence with Clover Creek	Aug.	27	17.6
		Oct.	14	28.8

* Estimated

TABLE B-8 (contd.)

Stream	Location of measurement	Date		Discharge in cubic feet per second
Cow Creek	Below Silverbridge Road	Aug.	27	8.8
		Oct.	14	21.7
Clover Creek	At old Highway 44	Apr.	1	15*
		Apr.	21	10*
		June	11	20*
		July	1	0.1*
		Aug.	10	0.1*
		Aug.	27	0
		Sept.	17	0.1*
		Sept.	30	0.2*
		Oct.	12	0.2*
Oak Run Creek	At old Highway 44	Apr.	1	8*
		Apr.	21	4*
		June	4	3*
		June	11	10*
		June	15	0
		Aug.	10	0
		Aug.	27	0
		Sept.	30	0
		Oct.	12	0
North Cow Creek	At old Highway 44	Apr.	1	10*
		Apr.	21	10*
		June	11	20*
		July	1	0
		Aug.	10	0
		Aug.	27	0
		Sept.	30	0
		Oct.	12	0

* Estimated

TABLE B-9

DAILY MEAN DISCHARGE OF KILARC POWERHOUSE DITCH
ABOVE SIPHON

May 1 to September 30, 1964

(In cubic feet per second)

Day	May	June	July	August	September
1	15.3	44	34	28	23
2	43	43	34	28	24
3	43	43	34	25	24
4	43	43	34	25	23
5	51	43	34	25	23
6	55	46	33	25	23
7	55	46	32	25	23
8	51	46	32	25	23
9	46	46	32	25	23
10	46	45	31	25	23
11	44	44	31	25	23
12	44	43	31	24	23
13	46	43	31	24	23
14	45	43	31	24	23
15	43	43	30	24	23
16	43	43	30	24	23
17	43	43	30	24	23
18	43	43	29	24	22
19	43	43	29	24	22
20	43	42	29	24	22
21	43	40	29	24	22
22	43	39	28	24	22
23	43	39	28	24	22
24	43	38	27	24	22
25	43	37	27	24	22
26	43	37	27	24	22
27	45	37	27	24	22
28	45	36	28	24	22
29	44	36	28	24	22
30	44	35	28	24	22
31	44		28	23	
Mean	44.0	41.6	30.2	24.5	22.6
Discharge in acre-feet	2,705	2,475	1,857	1,506	1,345

Total for period - 9,888 acre-feet

TABLE B-10

DAILY MEAN DISCHARGE OF
SOUTH COW CREEK POWERHOUSE DITCH

May 1 to September 30, 1964

(In cubic feet per second)

Day	May	June	July	August	September
1	60	42	21	16.0	20
2	58	38	22	13.0	17.2
3	59	39	23	14.5	17.0
4	0	39	25	14.5	16.5
5	0	39	24	15.0	15.2
6	0	42	22	14.7	14.7
7	0	46	21	14.5	14.5
8	22	49	21	15.2	13.7
9	56	56	21	14.0	14.0
10	56	55	19.4	14.7	14.2
11	55	51	21	14.2	14.7
12	56	48	19.6	12.8	13.3
13	56	43	16.5	12.1	12.3
14	56	40	15.2	12.1	12.1
15	56	38	16.0	13.5	12.3
16	56	39	16.2	14.2	12.3
17	56	38	16.5	13.5	12.6
18	55	37	16.7	12.8	13.3
19	54	36	17.5	15.2	13.0
20	54	34	17.0	14.0	11.9
21	52	31	16.5	14.0	11.9
22	51	28	15.7	13.0	11.9
23	49	27	16.2	12.3	11.4
24	48	27	16.0	11.2	12.1
25	48	25	14.7	12.3	12.1
26	50	23	12.3	13.3	11.4
27	54	23	13.5	11.9	12.3
28	53	23	16.0	13.0	13.5
29	48	21	17.8	12.3	13.0
30	45	22	15.2	12.3	13.3
31	43		14.7	13.0	
Mean	45.4	36.6	18.1	13.5	13.6
Discharge in acre-feet	2,792	2,178	1,113	830	809

Total for period - 7,722 acre-feet

TABLE B-11

DAILY MEAN DISCHARGE OF BASSETT DITCH
ABOVE ALL LATERALS

May 1 to October 27, 1964

(In cubic feet per second)

Day	May	June	July	August	September	October
1	25	28	27	23*	29	24
2	25	28	26	23*	26	24
3	27	28	29	23*	25	24
4	26	29	30	23*	24	24
5	26	29	29	22*	24	25
6	25	29	28	22*	23	26
7	25	29	29	22	22	25
8	26	31	28	22	22	25
9	27	30	29	23	21	24
10	26	24	29	25	22	24
11	25	23	30	24	22	24
12	25	23	29	23	21	25
13	25	24	30	23	20	26
14	23	24	28	22	21	26
15	22	23	28	22	20	26
16	22	24	29	22	21	26
17	22	23	28	22	22	20
18	23	21	28	23	22	21
19	23	21	28	22	22	21
20	23	21	27	19.6	23	21
21	23	21	26	18.5	23	21
22	26	25	25	18.5	23	21
23	29	29	25	20	23	21
24	28	29	24	19.6	23	22
25	28	28	24	19.3	23	22
26	30	28	24	22	23	22
27	29	27	24	22	23	22
28	24	27	24	21	24	
29	23	27	24	21	22	NO
30	25	27	23	22	23	
31	29		23*	23		RECORD
Mean	25.6	26.1	26.9	21.8	22.7	23.4
Discharge in acre-feet	1,574	1,553	1,654	1,340	1,350	1,253

Total for period - 8,724 acre-feet

*Estimated

TABLE B-12

DAILY MEAN DISCHARGE OF GERMAN DITCH
ABOVE ALL LATERALS

May 7 to October 28, 1964

(In cubic feet per second)

Day	May	June	July	August	September	October
1		11.1	10.5	10.7	11.1	10.8
2		10.9	10.4	10.7	10.8	10.8
3	NO	10.7	10.4	10.8	10.7	10.8
4		10.7	10.3	10.8	10.4	10.8
5	RECORD	10.7	10.1	10.8	10.4	10.7
6		10.8	10.1	10.7	10.4	10.7
7	12.4	11.1	10.0	10.7	10.4	10.7
8	12.4	11.4	10.0	10.5	10.4*	10.9
9	12.4	11.8	9.9	10.4	10.4*	10.8
10	12.7	11.5	9.9	10.4	10.4*	10.9
11	12.8	11.4	9.6	10.7	10.4*	10.8
12	13.3	10.8	9.9	10.9	10.4*	10.8
13	13.5	10.7	10.5	10.9	10.4*	10.9
14	13.4	10.4	10.7	11.1	10.4*	10.9
15	13.5	10.3	10.7	11.1	10.4*	11.1
16	13.7	10.4	10.7	11.1	10.4*	11.1
17	13.5	10.1	10.4	11.1	10.4*	11.1
18	13.5	10.0	10.0	11.2	10.4	11.1
19	13.4	10.7	10.0	11.2	10.5	11.1
20	13.3	11.1	10.0	11.2	10.7	11.1
21	13.1	11.1	10.0	11.2	10.9	11.1
22	12.8	10.9	10.0	11.2	10.8	11.1
23	12.7	10.8	10.1	11.1	10.7	11.1
24	12.4	10.8	10.1	11.1	10.8	10.9
25	12.1	10.7	10.1	10.9	10.7	11.1
26	12.2	10.8	10.3	10.7	10.7	11.1
27	12.5	10.7	10.3	10.5	10.8	11.4
28	12.2	10.7	10.4	10.5	10.8	11.7
29	11.8	10.5	10.3	10.4	10.8	NO
30	11.4	10.4	10.4	9.9	10.8	
31	11.2		10.7	9.9		RECORD
Mean	12.7	10.8	10.2	10.8	10.6	11.0
Discharge in acre-feet	630	643	627	664	631	611

Total for period - 3,806 acre-feet

*Estimated

TABLE B-13

DUTY OF WATER MEASUREMENTS
PUMP DIVERSIONS

1964

Pump	Duty of water (acres irrigated by 1 cubic foot per second)	
	Entire season**	Maximum month
Sprinkler pumps		
Hall North Pump	146	99
Blomquist Pump	107	75
Junkans North Pump	114	94
Otten Pump	78	71
Pearson Pump*	67	50
Average	102	78
Border-check pumps		
Pearson Pump*	67	50
Hunt Pump	80	70
Junkans South Pump	116	77
Tuttle Pump	78	61
Maynard Pump	86	56
Stone-Fitzpatrick Pump	62	42
M. Hawes Pump	85	58
Average	82	59

* The place of use under this pump is partly irrigated by sprinkler and partly by border-checks.

** Season used was approximately April 10 to October 27.

APPENDIX C

APPLICATIONS BEFORE THE STATE WATER RIGHTS BOARD

Since the Water Commission Act of 1913 went into effect, a new appropriative water right may be initiated only by filing an application with the State. If the application is approved, a permit is issued allowing the project to proceed. After use of water has been completed under the terms of the permit, a license is issued confirming the appropriation. Nine such appropriative water rights from the stream system are currently on file in the records of the State Water Rights Board. They are listed and described below in order of priority. Details of the diversion systems named in the applications are contained in the various tables of Appendix A.

Application 237 was filed on January 25, 1916, by the Big Cow Creek Ditch Company to appropriate water from Cow Creek for irrigation purposes. The application was approved on August 30, 1919, allowing diversion of 11 cubic feet per second. License 1857 was issued on June 1, 1938, confirming the appropriation of 11 cubic feet per second from April 1 to December 1 of each year for irrigation use on 854 acres on both sides of Cow Creek and on both sides of Deschutes Road within Sections 4, 7, 8, 9, 17, 18, 19, and 29, T31N, R3W. The diversion point was within NE$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 5, T31N, R3W, on the south bank of Cow Creek a short distance above its confluence with Clover Creek. On April 29, 1960, a

hearing was held by the State Water Rights Board to decide what disposition should be made of the appropriation after it was learned that the diversion works had been washed out and abandoned, and that Big Cow Creek Ditch Company was defunct. The hearing revealed that the only use then being made under the license was diversion of two cubic feet per second from Cow Creek by Howard M. and Gladys Leggett from about April 1 to about December 1 of each year for irrigation of 80 acres comprising the W$\frac{1}{2}$ of SE$\frac{1}{4}$ of Section 8, T31N, R3W. The Board ordered the license amended accordingly and ownership now rests with the Leggetts. The point of diversion authorized is in the NW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 8, T31N, R3W, about 1/4 mile downstream from the existing Leggett Pump (Diversion 95).

Application 3256 was filed on February 15, 1923, by Fred H. Rengstorf to appropriate water from an unnamed stream tributary to Ash Creek for irrigation purposes. The application was approved on June 18, 1923, allowing diversion of 1.0 cubic foot per second. License 969 was issued on January 10, 1931, confirming the appropriation of 1.0 cubic foot per second from April 1 to November 1 of each season for irrigation of 80 acres within the NW$\frac{1}{4}$ of Section 8, T32N, R1E. The present owner is June M. Owbridge. The point of diversion is within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E, and is the same point named in Application 8522. It is designated as Diversion 18 on the State Water Rights Board map and in this report.

Application 8522 was filed on December 17, 1935, by Henry S. Lace to appropriate water from an unnamed stream tributary to Ash Creek for irrigation purposes. The application was approved on May 12, 1936, allowing diversion of 3.0 cubic feet per second. License 2350 was issued confirming the appropriation of 0.61 cubic foot per second from April 1 to November 1 of each year for irrigation of 20 acres within the NW$\frac{1}{4}$ of Section 8, T32N, R1E. The license was assigned to June M. Owbridge on December 21, 1958. The point of diversion is identical with that under Application 3256 and is within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 8, T32N, R1E. It is designated as Diversion 18 on the State Water Rights Board map and in this report.

Application 11528 was filed on August 26, 1946, by A. F. Hufford to appropriate water from Cow Creek for irrigation purposes. The application was approved on February 20, 1947, allowing diversion of 3.0 cubic feet per second. License 3974 was issued on July 15, 1954, confirming the appropriation of 1.5 cubic feet per second to be diverted from May 1 to November 1 of each year for irrigation of 100 acres within Sections 29 and 32, T31N, R3W. The license was assigned to Glenn Pearson on April 12, 1961. The point of diversion is within the SW$\frac{1}{4}$ of SE$\frac{1}{4}$ of Section 29, T31N, R3W, and is designated as Diversion 110 on the State Water Rights Board map and in this report.

Application 11695 was filed on January 15, 1947, by Mrs. O. G. Brown to appropriate water from Cow Creek for irrigation purposes. The application was approved on May 29, 1947, allowing

diversion of 1.0 cubic foot per second. License 5909 was issued on December 7, 1959, confirming the appropriation of 0.3 cubic foot per second to be diverted from April 15 to October 15 of each year for irrigation of 24 acres within the SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 29, T31N, R3W. The license was assigned to John F. and Lucille Swoboda on February 8, 1962. The point of diversion is within the NW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 29, and is designated as Diversion 109 on the State Water Rights Board map and in this report.

Application 12138 was filed on October 29, 1947, by A. F. Hufford to appropriate water from Cow Creek for irrigation purposes. The application was approved on July 15, 1948, allowing diversion of 0.5 cubic foot per second. License 3975 was issued on July 15, 1954, confirming the appropriation of 0.5 cubic foot per second from May 1 to November 1 of each year for irrigation of 40 acres within the W$\frac{1}{2}$ of NE$\frac{1}{4}$ of Section 29, T31N, R3W. The point of diversion is within the NE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 29, and is designated as Diversion 107 on the State Water Rights Board map and in this report.

Application 14586 was filed on November 23, 1951, by R. M. and Jeanne Reid to appropriate water from Cow Creek for irrigation purposes. The application was approved on March 24, 1952, allowing diversion of 2.0 cubic feet per second. License 6515 was issued on March 21, 1962, confirming the appropriation of 2.0 cubic feet per second from April 1 to November 15 of each year for irrigation of 140 acres within the E$\frac{1}{2}$ of Section 8, T31N, R3W. The appropriation was assigned to Howard M. and Gladys A. Leggett on

May 19, 1952. The point of diversion is within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 8, T31N, R3W, and is designated as Diversion 95 on the State Water Rights Board map and in this report.

Application 17636 was filed on June 3, 1957, by Earle H. and Geneva Warner, Sr. and Earle H. and Noel Warner, Jr. to appropriate water from Cow Creek for irrigation, domestic, and stockwatering purposes. Permit 11340 was issued on April 23, 1958, allowing diversion of 1.51 cubic foot per second from April 1 to November 1 of each year for domestic and stockwatering purposes and irrigation of 120 acres within Section 20, T31N, R3W. The ownership of the permit is now as follows:

F. C. Stone, Geneva Stone, Charles W. Stone and Clara Stone	1/5 interest
David P. Fitzpatrick and Mildred M. Fitzpatrick	4/5 interest

The point of diversion under the application is within the SE$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 20, T31N, R3W, and is designated as Diversion 105 on the State Water Rights Board map and in this report.

Application 19280 was filed on March 4, 1960, by John K. and Evonne F. Watkins to appropriate water from an unnamed stream tributary to Cow Creek for irrigation and stockwatering purposes. Permit 12547 was issued on November 29, 1960, allowing 36 acre-feet per annum to be collected to storage between November 1 and May 30 of each season. The land to be irrigated consists of 7 acres within the SW$\frac{1}{4}$ of NE$\frac{1}{4}$ of Section 18, T31N, R3W. The point of diversion is an earthfill dam west of Deschutes Road within the

SE$\frac{1}{4}$ of NW$\frac{1}{4}$ of Section 18, T31N, R3W, and is designated as Diversion 97 on the State Water Rights Board map and in this report. The permit is now owned by C. M. Dicker, Inc.

APPENDIX D

STATE OF CALIFORNIA
STATE WATER RIGHTS BOARD

IN THE MATTER OF THE DETERMINATION OF THE RIGHTS OF THE VARIOUS CLAIMANTS TO THE WATERS OF COW CREEK STREAM SYSTEM, EXCEPTING CLOVER CREEK, OAK RUN CREEK, AND NORTH COW CREEK, IN SHASTA COUNTY, CALIFORNIA	ORDER GRANTING PETITION FOR DETERMINATION OF WATER RIGHTS

John Crowe, W. J. Bryant, Elmer Junkans, B. C. Bingham, Carl F. Tuttle, Jr., E. D. Maynard, R. Maynard, E. C. Frisbie, Alex J. Otten, Dennis S. Welch, Ernest Bargsten, Jesse D. Hufford, Jr., Glenn Pearson, and Albert F. Hufford having on the 12th day of August, 1963, filed with the State Water Rights Board a petition requesting a determination of the rights of the various claimants to the waters of Cow Creek Stream System excepting Clover Creek, Oak Run Creek, and North Cow Creek, in Shasta County, California, and the Board having made an investigation of the facts and conditions in said matter, finds that the facts and conditions are such that the public interest and necessity will be served by a determination of all rights in and to the waters of said stream system (save and except the right to take water from an underground supply other than a subterranean stream flowing through known and definite channels).

NOW THEREFORE, IT IS ORDERED that said petiton be, and it is hereby granted, and it is further ordered that the examination of said stream system shall begin on December 2, 1963.

Adopted as the order of the State Water Rights Board at a meeting duly called and held at Sacramento, California, on the 18th day of October, 1963.

/s/ Kent Silverthorne

Kent Silverthorne, Chairman

/s/ Ralph J. McGill

Ralph J. McGill, Member

/s/ W. A. Alexander

W. A. Alexander, Member

Parks, Jeff@Waterboards

From: Whitmore Bob <rjroth@frontiernet.net>
Sent: Thursday, April 18, 2013 10:19 PM
To: Parks, Jeff@Waterboards
Subject: Kilarc-Cow Creek Hydroelectric Project License Surrender -- Comment
Attachments: WWB11101.PDF

Attention: Mr. Jeffrey Parks
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000
Email: JParks@waterboards.ca.gov
Subject :Notice of Preparation and Scoping Meeting for
an Environmental Impact Report for the
Kilarc-Cow Creek Hydroelectric Project License Surrender

Mr Parks, Thanks for saving money by utilizing electronic media!
I ask that you accept this electronic petition (PDF copy) as a comment, signed by stakeholders on April 14, 2013 at the Whitmore Community Center, Whitmore CA.
RJ Roth
rjr96096@frontiernet.net
10814 Blue Mountain Ranch Rd.
Whitmore, Ca 96096-0116

Petition to California State Water Resources Control Board

We the stakeholders in the PG&E P-606 Kilarc-Cow Creek license surrender proceeding support the preservation of Kilarc Reservoir and the rest of PG&E's infrastructure that can be repurposed if not dismantled.

Name:	Name:
So Jo Roth	R J Roth
R. Eleanore Rumbaugh	[illegible]
Verna Heidman	Jerry B Crane
Grant Thurston	LINDA BARNGROVE
Cheryl Miller	[illegible]
Jeanine Thurston	[illegible]
Brent Greenwood	TIM MILLER
[illegible]	TIM DYE
[illegible]	TINA HARDEN
Robert MARK	[illegible]

Petition to California State Water Resources Control Board

We the stakeholders in the PG&E P-606 Kilarc-Cow Creek license surrender proceeding support the preservation of Kilarc Reservoir and the rest of PG&E's infrastructure that can be repurposed if not dismantled.

Name:	Name:
STEVE SKAGGS	Dale A Dimon
KENTON Y CRIST	Shawna Brady
NICOLA J. CRIST	LARRY BOGUE
Matt Aissen	
Christian George	
Carter Kendall	
Thomas R Dye	
Dianne L Dye	
Lisa B Dale Dimon	
CORY WEIR	

Parks, Jeff@Waterboards

Subject: FW: Comment of Todd Wroe and Tom Kamp re: Groundwater for FERC P-606 (Kilarc) Water Quality Certification
Attachments: 20090330P606WaterSupplyImpacts-5006(20648262).pdf

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 12, 2013 2:58 PM
To: Parks, Jeff@Waterboards [private]
Cc: [private]
Subject: Comment of Todd Wroe and Tom Kamp re: Groundwater for FERC P-606 (Kilarc) Water Quality Certification

Jeff - Attached is a copy of a P-606 filing assigned FERC Accession No. 20090330-5006 that is relevant to the State Water Board analysis, but was ignored by PG&E and the FERC, and could easily be overlooked given the huge volume of material that you are sifting through now. In response to my below e-mail, Todd Wroe provided the additional new comment for your consideration:

On 4/9/2013 6:26 AM, lyle wroe wrote:
I WOULD JUST LIKE TO EXPRESS MY OPINION ON THE CLOSING AND DISMANTLING OF KILARC RESERVOIR. BESIDES BEING AN EXCELLENT SOURCE OF CLEAN, EFFICIENT POWER, IT IS ALSO A COMMUNITY LANDMARK. FOR THE COMMUNITY OF WHITMORE, IT WOULD BE EQUAL TO REMOVING SHASTA DAM FROM REDDING, OR HOVER DAM FROM VEGAS. TO SAY IT WOULD HAVE A NEGATIVE EFFECT ON OUR ENVIRONMENT WOULD BE AN EXTREME UNDERSTATEMENT. YOU CURRENTLY HAVE HUNDREDS OF PEOPLE WHO HAVE VOICED THEIR OPINION ABOUT THE CLOSING DOWN OF KILARC. I HAVE YET TO HERE ONE GOOD REASON TO CLOSE IT DOWN. ALL OPINIONS HAVE BEEN TO KEEP IT OPEN. FOR P.G.&E. TO PUSH TO CLOSE AND DISMANTLE IT WOULD SHOW JUST HOW SELFISH A BIG CORPORATION CAN GET. I AM STRONGLY URGING OUR GOVERNMENT TO STEP UP AND DO THE RIGHT THING FOR A CHANGE, AND ALLOW THOSE WHO WISH TO TAKE OVER AND RUN THE POWER PLANT AS IT SHOULD BE. THANK YOU FOR YOUR TIME AND CONSIDERATION TO DO THE "RIGHT THING!" SINCERELY, TODD AND KIMBERLY WROE

On 4/8/2013 4:23 PM, Kelly W. Sackheim wrote Re: Please attend April 10 Kilarc Scoping Meeting or e-mail your support:

> The meeting is scheduled to be held from 6-8 p.m. at Millville Grange with the second part open for community comments. The State Water Board is demonstrating its intent to provide an even-handed review that with community support can result in the preservation of Kilarc Reservoir and the rest of PG&E's infrastructure that can be repurposed if not dismantled.
>
> A petition with the following simple statement will be available at the scoping meeting. You may want to print in advance and collect signatures of others that you can deliver to the meeting, or, if you cannot attend the meeting,

please let us know by reply e-mail or posting your support in a comment on the meeting notice at www.eastvalleytimes.com or on facebook at https://www.facebook.com/#!/KChydroCompanies?fref=ts and you will be counted among those supporting the positive efforts of the State Water Board that will achieve your goal.

Petition: We the stakeholders in the PG&E P-606 Kilarc-Cow Creek license surrender proceeding support the preservation of Kilarc Reservoir and the rest of PG&E's infrastructure that can be repurposed if not dismantled.

In addition to your name, you may provide a statement of the benefits provided by leaving PG&E facilities in place, or the adverse effects that would be experienced were the PG&E facilities to be removed.

Kelly
ph (NEW): 916-877-5947

On 3/12/2013 9:31 AM, Parks, Jeff@Waterboards wrote Re: Kilarc-Cow Creek NOP and Scoping Meeting:

> This notice is being sent to all email recipients on FERC's service list for P-606.
>
> The State Water Resources Control Board has issued a Notice of Preparation and Scoping Meeting for an Environmental Impact Report for the Kilarc-Cow Creek Hydroelectric Project License Surrender. Please see the attached notice for more information about the Project and the upcoming scoping meeting. You may also visit: http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml to see this notice and future information for this project.
>
> If there are any questions about this notice, please contact me by email or by phone as listed below.
>
> Thank you,
>
> Jeffrey Parks
>
> Water Resource Control Engineer
> Water Quality Certification Program
> Division of Water Rights
> State Water Resources Control Board
> (916) 341-5319

Save Kilarc Committee
info@savekilarc.org
or
c/o FoCCP
P.O. Box 144
Whitmore, CA 96096

March 27, 2009

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 – 1st Street, N.E.
Washington, DC 20426-0001 *filed electronically*

Ref: P-606-CA

Re: Objection to PG&E's Failure to Acknowledge Water Supply Impacts in its License Surrender Application (LSA)

Dear Ms. Bose:

Members of the Whitmore Community are important stakeholders in the disposition of the Kilarc facilities upon PG&E's license surrender. We have repeatedly been ignored by PG&E. The community comment letter on the LSA (#13), comment 12 regarding water supply impacts from loss of groundwater recharge to springs and wells, received the following response from PG&E:

> Any impacts of Project decommissioning on existing surface or ground water rights are appropriately addressed under state law and not through the federal license surrender process. As discussed in the LSA, owners of groundwater wells in the vicinity of Kilarc forebay do not have water rights to any artificial recharge that may occur as a result of Project operations. However, PG&E did solicit well production information from potentially affected well owners and is willing to consult with any well owners who can demonstrate adverse effects on well levels or yields from discontinuation of Project operations.

We would like to know, if the license surrender plan proposed by PG&E (for the FERC to approve, or not) results in an impact to our wells and springs, how can that be IGNORED in the FERC NEPA evaluation? We have the potential to be significantly impacted, even though state law may not explicitly identify that we have water rights based on over 100 years of artificial recharge.

We would also like to inform the FERC that while PG&E claims to have solicited "well production information from potentially affected well owners," their lame efforts were nothing more than an excuse to avoid doing any sort of analysis. In LSA Volume 2, Appendix B, Table 1: Kilarc-Cow Creek Hydroelectric Project Consultation and Public Outreach Log, there were two references to this issue:

> May 6, 2008 - Letter from PG&E to landowners to notify them of PG&E's intent to conduct a groundwater study and to ask for authorization to obtain California Department of Water Resources' Well Completion Reports. Addressees include: Lucile Lansing, Kim Wroe, Lyle Wroe, Lorin Neel, Ron Burrows, Barbara Arnold, Judith Arnold, Renee Arnold, Roger Arnold, William Arnold, and Tom Kamp.
>
> October 7, 2008 - Email to Jeremy Pratt (ENTRIX) from Stacy Evans (PG&E) with a record of a phone conversation with Lyle Roe. He no longer uses the well and had some questions regarding the project that were discussed with Steve Nevares."

Regarding the October conversation, I, Todd (Lyle) Wroe, did contact PG&E. PG&E told Wroe that the project would be shut down since no one else was interested in taking it over. Wroe asked if it would be possible to pipe in just enough water to keep the reservoir full and not use the hydro project until winter. He said that no one had proposed that. They would look into it. Wroe never heard back.

Regarding the May letter, I, Tom Kamp was never contacted by PG&E. Kamp does not have a Well Completion Report report but his spring is in the process of getting signed off by the county later this year to close out his building permit.

Furthermore, Glenn Dye filed a letter with the FERC dated October 18 (FERC accession number 20071022-5001) and sent copies by e-mail to Stacey Evans and Steve Nevares, with the attached table of "Citizens Concerned if Kilarc Decommissioned" – yet there was NO acknowledgement of this in either the Draft LSA or the final LSA.

Additionally, many comments were made regarding errors in maps presented by PG&E, including several regarding Kilarc Spillway No. 3:

> DLSA Figure E.2.6-2 Map 1 Old Cow Creek Study Area, Special Status Terrestrial Species Observed during 2003 and 2008 Surveys presents an incorrect alignment for Spillway No. 3 upstream of the spring-water supply for the residential property (there is no channel where it would in fact run uphill as the contour lines are correct). It is impossible to accurately analyze the hydrology effects on either wells/springs or botanical resources, when the maps developed by PG&E don't accurately reflect the project facilities for water delivery. (Comment 13-30)

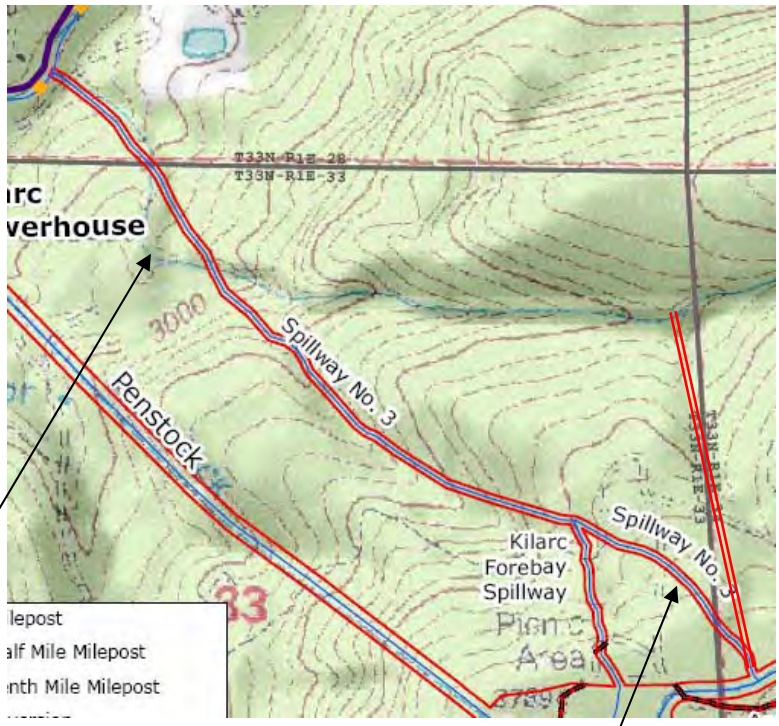
PG&E responded by stating that "LSA Figure E.2.6-2 has been revised" when in fact as illustrated below, the error still remains (and is also present on new figures 1-1 Features of the Kilarc Development and 2-1 Kilarc Development Access Roads, in addition to figures in any of the older analyses that were not revised before being inserted in the appendices).

Excerpt from LSA (new):

Figure E.2.6-2
Map 1
Old Cow Creek Study Area
Special Status Terrestrial Species Observed during 2003 and 2008 Surveys

Spillway channel enters and follows natural channel – it does not cut into grade as depicted here

Illustration of error:



Existing depiction of alignment runs uphill!
Water actually follows natural channel to existing spring as indicated with ||

Please do not ignore the community. A win-win solution can be achieved if PG&E will leave Kilarc facilities in place and support the community even slightly.

Sincerely,

Todd (Lyle) & Kim Wroe
Tom Kamp

Attachment

cc: "Evans, Stacy" SxEf@pge.com
"Nevares, Steven" SAN3@pge.com
Thomas "TJ" Lovullo Thomas.Lovullo@ferc.gov

Attchment:

CITIZENS CONCERNED IF KILARC DECOMMISSIONED

Identified below are Whitmore residents that may be affected by the loss of Kilarc Reservoir and diversion canal. The reservoir has over 100 years influenced ground wa in the area below Kilarc and the potential for impact has not been studied. A hydrolog study is requested before any plan to decommission the reservoir is proposed for implementation. Removal may require mitigation as it very well could seriously affect the quality of life and property values.

RESIDENT	LOCATION	SOURCE	VALIDATION
BETTS, PHIL	31250 TWO PONDS	SPRING	FORM
GOUCH, RICHARD	12273 FERN RD. E.	WELL	N/A
TREVELYAN, MAGGIE	13618 FERN RD. E.	WELL	TELECON
KAMP, THOMAS	31931 MILLER MTN RD.	SPRING	E-Mail/PIC
DONAHOE, WILL	12744 FERN RD. E.	SPRING/WELL	TELECON
ORR, PATSY	12502 FERN RD. E.	WELL	TELECON
WELLS, PATTY	13728 FERN RD. E.	WELL	TELECON
RODRIGUES, JOHN	13126 FERN RD. E.	WELL	FORM
McGARVEY, MICHAEL	14612 FERN RD. E.	SPRING	FORM
PALMER, MARK	30873 GLENDENNING WAY	WELL	FORM
MOON, KEN	31286 TWO PONDS LANE	WELL/ PONDS	TELECON
COMBS, PAUL	13140 FERN RD. E.	WELL	TELECON
POWER, JENNY	12118 TAMARAC RD.	SPRING	TELECON
NICORA, DEBBIE	SO. COW CREEK RD.	MILL CREEK GERMAN DITCH	TELECON
BREHMER, CHUCK	30517 WHITMORE RD.	GERMAN DITCH	TELECON
BRATTON, RICHARD	13126 FERN RD. E,	WELL	TELECON
GEORGE, RICHARD	10720 HUFFORD RANCH RD.	WELL	TELECON
McCLOSKY, PEGGY	28942 FARETHEEWELL LN	WELL	TELECON
SMITH, LYNN	13545 FERN RD. E.	WELL	TELECON
TUCK, MIKE	13542 FERN RD. E.	SPRING	TELECON
KURTZ, JACK	12855 FERN RD. E.	WELL	TELECON
BURNHAM, PAUL	14421 FERN RD. E.	WELL	TELECON
DYE, GLENN	30655 WHITMORE RD.	WELL	COMPILER
SARGENT, BILL	27899 WHITMORE RD.	IRRIGATION DITCH	TELECON
GRACE CHURCH	30637 WHITMORE RD.	WELL	TELECON
TILLIS, ART	29571 WHITMORE RD.	SPRING	TELECON

Validation: Signed form on file, telephone, or E-mail.
N/A previous concurrence, but currently not available

Document Content(s)

Parks, Jeff@Waterboards

Subject: FW: Whitmore Community & Save Kilarc Committee Comments Relevant to P-606 (Kilarc) Water Quality Certification

Attachments: 20081110P606CarnleyWhitmoreCommunity-5005(20032873).pdf; 20090302P606AltsSaveKilarc-5097(20494113).pdf

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From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 12, 2013 3:11 PM
To: [private] Parks, Jeff@Waterboards
Cc: [private]
Save Kilarc Committee Comments Relevant to P-606 (Kilarc) Water Quality Certification

Jeff - Attached for your consideration are two filings on the FERC P-606 docket, assigned FERC Accession Nos. 20081110-5005 and 20090302-5097, that provide a checklist of issues that PG&E refused to address and the FERC consequently ignored.

Community Stakeholders
info@savekilarc.org
or
c/o Carnley
P.O. Box 177
10471 Blue Mountain Ranch Road
Whitmore, CA 96096
calass@frontiernet.net

November 7, 2008

Stacy Evans, Project Manager
Pacific Gas and Electric Company
Power Generation
Mail Code N11C, PO Box 770000
San Francisco, CA 94117

Re: Written Comments due November 8 for PG&E to revise the DLSA and file the Final License Application with FERC

Dear Ms. Evans:

Members of the Whitmore Community are important stakeholders in the disposition of the Kilarc facilities upon PG&E's license surrender. We have repeatedly been ignored.

Citizen comments and other attachments to this letter demonstrate the significant, unmitigated impacts of your proposed "Decommissioning Plan." The concept for this plan was first introduced to us in March 2007 - after PG&E developed a March 2005 agreement for signature by a group of stakeholders from which the community was excluded. In September 2007, PG&E released a lengthy document describing your plan for review and comment. PG&E then incorporated the same plan, without taking into consideration comments received by the community, into your "Draft License Surrender Application" dated September 4, 2008. The plan, virtually unchanged since it was first conceived by PG&E, would be an unmitigated disaster for the Whitmore Community and is totally unnecessary.

A majority of the community concerns were first raised at your public meeting in March 2007, reiterated in September/October 2007 following the release of your plan to demolish valuable assets at great cost to us ratepayers, and continue to be completely ignored in your latest document.

Our latest comments are cross-referenced to the totally inadequate analysis in your DLSA in the first attachment to this letter. The attachment proves that there would be significant, unmitigated impacts of PG&E's decommissioning plan. These impacts

would be avoided by the feasible alternative to leave all Kilarc facilities in place for future use. Our community, with support from Davis Hydro, is prepared to take responsibility for the facilities PG&E will abandon and fully address in so far as possible the fish issues. The problem remains that PG&E is raising unnecessary obstacles to a win-win future situation.

PG&E states that the net book value of the Project is estimated to be approximately $5 million – and proposes to spend $14.5 million of OUR ratepayer money to destroy it. It makes much more sense for PG&E to donate the facilities, and allocate ratepayer funds authorized by the CPUC to foster the success of future project benefits. PG&E should NOT "be entitled to receive its net investment plus severance damages" (DLSA Section D.2 Amount Payable in the Event of Project Takeover). PG&E should not be compensated because it cannot continue to operate the project cost-effectively. PG&E should not be allowed to stand in the way of ratepayer and community interests.

Significant, unmitigated effects of the proposed dismantling plan, that would be addressed by developing and selecting a project alternative as required under NEPA, include:

- Loss of local recreation that is especially suitable for youth and handicapped
- Destruction of a historic resource
- Water supply impacts from loss of groundwater recharge to springs and wells
- Loss of fire suppression capability puts our community and natural resources at risk
- Downstream water quality impacts on endangered fish
- Impacts to wildlife and natural resources, including wetlands and potentially endangered species
- Potential hazard of dangerous wildlife seeking water on residential and ranch properties
- Deterioration of local economy and property values with disruption to ecological balance and community benefits that have evolved over 100 years with the project

Steelhead trout would also benefit from the proposed alternative – it is NOT necessary to dismantle the historic Kilarc Diversion, Canal and Reservoir to save this endangered species. The Proposed PG&E solution is based on returning fish to an area where they have never been seen, and will be very difficult to get to or grow in no matter whether there is hydro or not.

PG&E indicated that you would not respond to comments provided verbally when you presented your latest document. Therefore, 14 concerned local citizens attended a community meeting (see attached sign-in sheet) on October 29, 2008 to repeat concerns that we do not believe are adequately addressed in the PG&E document. One participant prepared for our meeting by preparing a written list of Pertinent Studies. A dedicated note-taker summarized the issues as they were raised. These concerns expressed repeatedly by our community are presented in the latter attachments.

Please do not ignore the community. A win-win solution can be achieved if PG&E will leave Kilarc facilities in place and support the community even slightly.

Sincerely,

Laura Carnley for
Whitmore Community Stakeholders

Attachments: cross-reference of comments to DLSA statements and omissions, lists of pertinent studies and community concerns raised in October 29, 2008 meeting, sign-in sheet of meeting participants and signatures and comments of stakeholders who concur with this letter

Enclosure: Excerpts from DLSA Appendix L, Cultural Resources Report pertaining to recordation of Kilarc hydroelectric system (excluding the powerhouse), including report cover, two sequential text pages (unnumbered) and pages 1-30 of Department of Parks and Recreation Primary Record for Resource Name or #: 482-12-07H, Other Identified: Kilarc Canal

cc: comments@kilarc-cowcreek.com
"Evans, Stacy" SxEf@pge.com
"Nevares, Steven" SAN3@pge.com

Kilarc-Cow Hydroelectric Project
Draft License Surrender Application Comments
c/o Darcy Kremin
2300 Clayton Road, Suite 200
Concord, CA 94520

Filed to P-606 in FERC e-library

General Comments:

The DLSA reflects PG&E's perspective and is not designed for easy reference by the community. It was prepared to support PG&E's assertion that its decommissioning plan would have no significant impacts on the community or natural resources.

1. The Community Stakeholders request that PG&E revise the Initial Statement found in the DLSA to include at a minimum two addresses in Whitmore for community stakeholders in Item 7. (currently on Page IS-6) Name and address and address [sic] of every other political subdivision or other entity in the general area of the Project that there is reason to believe would likely be interested in, or affected by, the surrender application:" The addressees should be Mr. Thomas Glenn Dye, original Chair of the Save Kilarc Committee with whom you are most familiar, and Ms. Laura Carnley, who is transmitting these comments on behalf of the Whitmore Community Stakeholders as described. PG&E should also continue to utilize its full mailing list of community members who have requested additional information at any time from the beginning through the conclusion of the license surrender process.

PG&E could have made the DLSA much easier for the community to read and understand. **DLSA Section ES.3.2 Contents** is both informative and misleading. It states that the application is composed of one volume, while the DLSA Table of Contents identifies the "List of Appendices" and their locations in Volume 2 and Volume 3. Section ES.3.2 identifies that the one volume contains This Executive Summary and An Initial Statement – and yet these are omitted entirely from the DLSA Table of Contents.

2. The Community Stakeholders request that PG&E revise its license surrender application to include the Executive Summary and Initial Statement in the Table of Contents.

The concerns raised by the community have NOT been addressed, and the burden of proof should not be on the community to determine PG&E's rationale for dismissing significant issues. The document, provided mostly on CD, is impossible for many community members to access, and cannot be understood without printing major portions. To review PG&E's analysis of a single issue, it is necessary to look in up to ten separate sections of the report, although most is found in the Exhibit E: Environmental Report – for example, according to the table of contents, to review the Recreation issue for the Kilarc Development alone, a reader must locate pages E.2-98 through 100, E.2-168 through 172, E.2-207 (a separate folder of figures on the CD), E.3-30 through 31, E.4-18 through 20, and E.5-14 through 15. A total of 16 pages (or fraction) in six different locations (ignoring the table of contents, executive summary and actual project description). Some issues also have additional information in appendices.

NEPA requires certain elements but it allows the environmental report to be organized in whatever manner facilitates analysis. PG&E's document could have been divided by topic issues and then put the affected environment, impacts, and mitigations together. The local public is primarily interested in the Kilarc Development, while private landowners with property abutting or provided water through the South Cow are interested in that development.

3. The Community Stakeholders request that PG&E revise its license surrender application to address the Kilarc Development separately from the South Cow (even if common information must be repeated in both sections), and group for each topic issue the discussions of affected environment, impacts, and mitigations, with all corresponding tables and figures.

The concerns of Community Stakeholders in the other attachments to this letter were not adequately addressed in the DLSA. The following discussion follows the order of topic issues used in the DLSA, and addresses together the deficiencies for each in the discussions of affected environment, impacts, and mitigations, with all corresponding tables and figures. Some topics have been combined to avoid disagreement regarding where an issue would best be addressed.

Topics 1 - 3. Geology and Soils, Hydrology and Water Resources, Geomorphology

All of the area stakeholders rely on wells, or springs for their household water. No study of ground water has been conducted since 1984 and the results were that it was marginal. Many homes have been added since that time. It is unknown where recharge originates and, for example, there is no other apparent source of recharge besides Kilarc for Two Ponds. It is unknown who and how much recharge depends on Kilarc.

DLSA Figure E.2.6-2 Map 1 Old Cow Creek Study Area, Special Status Terrestrial Species Observed during 2003 and 2008 Surveys presents an incorrect alignment for Spillway No. 3 upstream of the spring-water supply for the residential property (there is no channel where it would in fact run uphill as the contour lines are correct). It is impossible to accurately analyze the hydrology effects on either wells/springs or botanical resources, when the maps developed by PG&E don't accurately reflect the project facilities for water delivery.

DLSA Section E.3.2.3 Evaluation of Water Rights & Use states:
"Any impacts of decommissioning on existing surface or ground water rights are appropriately addressed under state law and not through the federal license surrender process. […] The groundwater wells in the vicinity of Kilarc forebay do not have water rights to any artificial recharge water that may occur from the Project. However, PG&E will consult [regarding alternatives] with any well owners who claim post-decommissioning effects on well levels or yields from discontinuation of the artificial flows."

The above statements are patently FALSE – the federal license surrender process requires a NEPA evaluation. The impacts to community wells ARE a direct project effect that must be assessed and to "consult" with well owners does not MITIGATE the problem.

Reduction of groundwater recharge and yield of springs and wells upon which residents depend could occur due to removal of the Kilarc canal and reservoir and must be characterized as a POTENTIALLY SIGNIFICANT adverse effect for which mitigation must be defined.

Reduction of groundwater recharge could also result in a secondary effect of subsidence, a POTENTIALLY SIGNIFICANT adverse effect on ground stability.

Reduction of groundwater recharge could also result in a secondary effect on natural resources, including old growth trees and wetlands, a SIGNIFICANT adverse effect on habitat. [Topics 6 and 7]

The Kilarc Reservoir is a water resource available for helicopter bucket refilling to suppress wild land fires in the area. The local fire company supports retention as this has helped in controlling numerous fires. Removal of the Kilarc reservoir must be characterized as a SIGNIFICANT adverse effect for which mitigation must be defined.

Topic 4. Water Quality

The community asserts, and has collected and shared data to prove, that the project reduces the temperature of water delivered to actual fish habitat in the lower reaches of Old Cow Creek after being held at higher elevation for longer in the canal, and then passing through the turbines that capture heat with the energy generation, even more than the 2 degrees centigrade (e.g. just under 4 degrees Fahrenheit) cited by PG&E.

DLSA Section E.2.4.7 2003 Water Temperature Conditions states that the "decommissioning" (e.g. proposed dismantling) "will eliminate any effect of the Project on water temperatures." In fact, the beneficial effect of the Project reducing downstream temperatures, by being eliminated, where "Temperature is a significant limiting factor for aquatic biota" will in fact cause a SIGNIFICANT adverse effect where "The Basin Plan objectives state that temperatures for cold or warm interstate waters are not [sic] be increased by more than 5-degrees Fahrenheit above natural receiving water temperature and NO [emphasis added] increase is allowed which impacts beneficial uses." This colder water has got to have an effect on the fish areas downstream.

Topic 5. Aquatic Resources

To reiterate, this letter requests a focus on disposition of Kilarc Facilities independent of South Cow. The community asserts that there are no studies showing that Steelhead have

ever spawned in the area above Whitmore Falls, a natural barrier well below the Kilarc facility. Recent communication from Howard Brown of NMFS to M. Accituno of Entrix, July 16, 2008 states: "Critical habitat for Steelhead extends upstream to near the Whitmore Range Station and Whitmore Falls."

The community asks, what fish are currently in the by-passed reach? Planted fish or native species?

Local people have never caught steelhead, or observed any other fish to catch, in the by-passed reach, as corroborated by descendents of pioneer families.

Local people who have walked up the by-passed reach observe that there is already more good habitat in the ditch than up the creek, with rock gravel bottom in sections.

DLSA Section E.3.5 Aquatic Resources identifies the threshold criteria to include "Create new, complete barriers to upstream fish migration" – which clearly will not occur when either removing or leaving facilities in place without creating any new barriers. Another criteria is "Result in a level of mortality that substantially reduces the population of a native fish species, or negatively affects individuals of or the long-term persistence of populations of special-status fish species" – yet NO long term adverse effects, such as the increase in temperature in reaches downstream of the project, described in the preceding section, are identified, and the presumed long term benefits are not even identified, except by stating without justification "The removal of Project features and the cessation of diversions would return the Project-affected bypass reaches to a more natural state and is expected to result in long-term benefits for the aquatic species. Water temperature results from 2003 indicated that decommissioning would lower water temperatures in the bypass reaches (see Section 3.4, Water Quality); therefore no thermal impacts to aquatic resources would be expected."

Conversely, there is no evidence that any of the threshold criteria established by PG&E would be violated by leaving project facilities in place, which is essential to addressing the SIGNIFICANT unmitigated effects of the proposed dismantling of facilities in many other topic areas as documented in this letter.

Topics 6 and 7. Wildlife Resources and Botanical Resources

DLSA Section E.3.6 Wildlife Resources establishes the threshold criteria to include "Cause a substantial loss of foraging or breeding habitat." The dismantling of the Kilarc Forebay alone would cause such a loss.

DLSA Figure E.2.6-2 Map 1 Old Cow Creek Study Area, Special Status Terrestrial Species Observed during 2003 and 2008 Surveys presents an incorrect alignment for Spillway No. 3 upstream of the spring-water supply for the residential property (there is no channel where it would in fact run uphill as the contour lines are correct). It is impossible to accurately analyze the hydrology effects on either wells/springs or

botanical resources, when the maps developed by PG&E don't accurately reflect the project facilities for water delivery.

DLSA Figure E.2.6-2 Map 1 Old Cow Creek Study Area, Special Status Terrestrial Species Observed during 2003 and 2008 Surveys clearly includes the botanical Big-scale Balsamroot in the key. A map with botanical data really belongs under Topic 7, not lost in this map for Topic 6. This species never came up in a recent CNPS search (default search is a 9-quad search, being the target quad and surrounding quads). A location of this species in Shasta County represents a significant habitat extension (it is not recorded anywhere else in Shasta County.). It is a CNPS List 1B.2 species, a high rarity rating. Pops up on DFG lists.

4. The Community Stakeholders want to know why PG&E's biologists did not send in a record to CNPS for big-scale balsamroot.

The community has observed that there is much wildlife that inhabits the Kilarc Forebay: Bald Eagles, Osprey, Swallows, Water Snakes, Salamanders, deer, and smaller animals. PG&E underestimates the impact, with fish providing food for Pelicans down in winter, as well as other migratory birds that pass frequently – Whitmore is a wildlife "restaurant" for migratory birds, swans, etc. It is on the Pacific Flyway and is a small stopping place for Waterfowl. Ducks have even raised their ducklings there and have been observed teaching them to fly. Elimination of the Kilarc Forebay must be characterized as a SIGNIFICANT adverse effect on such wildlife habitat.

The diverse wildlife makes Whitmore a very attractive place to live (for humans). Some species have already been disappearing since the 1960s, such as turtles and porcupines.

More habitat could be lost to wildfires, and trees could suffer for lack of water regardless, even though other species besides birds may be able to find other sources of water. The CUMULATIVE adverse effects of dismantling facilities as proposed by PG&E would be SIGNIFICANT.

With the hydropower project in place, Kilarc has become a refuge and recovery area for endangered species that later came to the area, allowing room for populations to grow and disperse, where there is ample food even though it is not the traditional habitat area.

The community asserts that the procedure for dismantling facilities will have a SIGNIFICANT adverse effect on some species such as bats that must be flushed out of the tunnel before it is closed.

Synthesis of Topics 5 – 8: Ecology.

The community asserts that there has been no known impact on the environment (fish, wild life, riparian) in the 104 years of operation of the project. PG&E fails to provide

any argument to the contrary. Change to an existing, stable environment may result in POTENTIALLY SIGNIFICANT adverse effects that PG&E has failed to even attempt to acknowledge. PG&E has only surveyed resources for a total of 5 days which is completely insufficient to characterize ecosystems that depend on the project features.

Topics 8 and 9. Historical Resources and Archaeological Resources

The community comments only on the Historical Resource, which is entirely public information. However, PG&E has stymied the assessment of its analysis by mischaracterizing historic resources as archaeological, and restricting release of the entire Cultural Report, presumably because of confidential location information for Native American Resources that has been buried in the same report.

5. The Community Stakeholders request that PG&E revise its license surrender application to address the Historical Resources separately from the Archaeological Resources, specifically releasing ALL non-confidential information in the Cultural Report (Appendix L) and more clearly cross-referencing in a single section of the DLSA (as requested in #3 above under General Comments), the findings and justification of the recorded features.

The DLSA provides a nearly 5-page historical context for the project area, of which 2 pages specifically address hydropower. The community also identified that Kilarc was the third powerhouse established in the region to replace wood-burning smelters – the whole system is historically important to the development of Shasta County. In the 20s through at least 1953, buildings adjacent to the powerhouse that have since been torn down served the local social life – and are not reflected in the short summary of the DLSA. The GANDA Cultural Resources Report (which has NO page numbers on the footers – page referenced is opposite Figure 26; the table of contents indicates Figure 27 is on the following page, but it is not) does identify that "Approximately 21 out of the 27 buildings existing at the site in 1919 had been removed by 1997 (PG&E 1979; Camp, Dresser & McKee 1997:4-1)."

The DLSA identified that "All resources identified within the APE were photographed and mapped with GPS equipment." (Page E.2-91) and "A total of seven architectural and historical resources were identified within or adjacent to the APE. All were recorded on Department of Parks and Recreation (DPR) standard forms, mapped and photographed. […] Table E.2.8.2-2 summarizes the architectural and historical resources described in this Draft LSA report." (Page E.2-92 with tables on Page E.2-166 [labeled only as Page 166 in the footer]; The Cultural Report identified as Appendix L to the DLSA was said to include confidential information and therefore was not released publicly. A single hardcopy of the Cultural Report was provided to the Shasta Historical Society.)

Page E.3-28 identifies the impact threshold criterion as "Cause a substantial adverse change in the significance of architectural and historical resources recommended for

eligibility in the NRHP or the CRHR." Given that the Kilarc Main Canal does not even appear as one of the seven architectural and historical resources identified in Table E.2.8.2-2, it becomes impossible to evaluate whether the Kilarc Main Canal meets this criteria. Nonetheless, the same criteria applies for archaeological resources (identified on page E.3-29).

A review of Tables E.2.8-2 and E.2.9-2 reveals that the Kilarc Main Canal (Temporary Number 482-12-07H), that presently serves as the active water conveyance structure delivering up to 52 cfs to the powerhouse is listed only in the latter table of *archaeological* resources.

6. The Community Stakeholders request that PG&E explain why a functioning feature integral to its current hydropower generation was characterized as an *archaeological resource*.

A review of section E.2.9 of the DLSA reflects that NO historical context is provided to support the discussion of historic site types in this section, rather than the preceding E.2.8. It is unclear why the Field Survey Results presented on page E.2-97 within section E.2.9 of the DLSA identify by number the features that appear to be indiscriminately assigned to either Table E.2.8-2 (the Kilarc Powerhouse [site 482-12-06H]) or Table E.2.9-2 (the Kilarc Inlet Canal and associated features [site 482-12-07H]) – except that PG&E does not propose to demolish the Powerhouse and would not be able to demolish the Kilarc Inlet Canal and associated features without mitigation if it were correctly characterized as eligible for listing and therefore a SIGNIFICANT adverse effect of the proposed decommissioning plan.

Table E.4.9-1. Recommendations for Archaeological Resources Identified within the APE provides the first indication of which such resources were deemed NRHP/CRHR Eligible – including only the Temporary Number for each resource, without the corresponding Name/Location. The Kilarc Main Canal was identified in Table E.9-2 with Temporary Number 482-12-07H, that was deemed "Not eligible" and nonetheless received a Recommendation for "No mitigation but avoid historic features where possible." – which appears commendable EXCEPT that PG&E's proposed plan involves complete removal of ALL features.

The GANDA report was consulted to determine WHY the Kilarc Main Canal was deemed "Not eligible" – one full page of text (across two pages, presented in the enclosure) proceed from "In summary, the Kilarc Powerhouse appears to [sic] eligible for the NRHP under Criteria A and C, and the CRHR under Criteria 1 and 3 at the state and local level." followed by the header for "Kilarc Hydroelectric System" that begins "The Kilarc hydroelectric system, including canals, dams, ditch tender cabins, bridges, flumes, siphons, tunnels, spillways, berms, a forebay, and a penstock, constructed in 1903-1904 by the Northern California Power Company, represents a local historic resource that provided hydroelectric power from a water diversionary system constructed throughout the Cow Creek watershed."

NOTE: the text incorrectly refers in the past tense that the LOCAL historic resource PROVIDED hydroelectric power. As described in the DLSA and above, the system is historically important to the development of Shasta County, not simply LOCAL interests (although these local interests clearly merit consideration as well!). And, the system continues to generate hydroelectric power, and according to Davis Hydro and the FERC, has the potential to continue generating following PG&E's license surrender.

The GANDA report concludes that "Although the Kilarc hydroelectric system has important historical associations and engineering significance, the system as a whole lacks integrity, and therefore the Kilarch hydroelectric system does not appear to be eligible to meet the criteria for listing on the NRHP or the CRHR." The GANDA report argues that the removal of associated buildings that were necessary for the many workers employed prior to the automation of the project, and "numerous" changes made to various components of the system, destroys the "integrity of location, design, setting, materials, workmanship and feeling and association" of the system "from an engineering and technological aspect." In short, the GANDA report argues that because PG&E has already destroyed important historic resources, PG&E should not be obligated to preserve the remaining features that ARE historic and highly valued by the community.

Why the "removal of associated buildings" detracts from the integrity of the Kilarc Canal "from an engineering and technological aspect" when the Kilarc Powerhouse (that is geographically closer to the associated buildings that no longer exist) is deemed eligible for listing, is a mystery, again – except that PG&E does not propose to demolish the Powerhouse and would not be able to demolish the Kilarc Inlet Canal and associated features without mitigation if it were correctly characterized as eligible for listing and therefore a SIGNIFICANT adverse effect of the proposed decommissioning plan.

7. The community challenges the finding that the remaining Kilarc hydroelectric system, especially including the water conveyance structures, is NOT eligible for listing, as supported by the evidence provided in the corresponding record (scanned copy attached – of 44 features photographed along the 3+ mile canal, only a dozen steel flumes and various bridges over the flume are deemed "modern"). The community requests a comprehensive revision to the analysis in the GANDA report and summary of findings presented in the DLSA to reflect that the Kilarc hydroelectric system, e.g. the Kilarc Canal and Forebay and associated structures, ARE features eligible for listing in the NRHP and the CRHR.

It is similarly unclear why, in the final paragraph on page E.2-97, within section E.2.9 of the DLSA, PG&E states "Site P-45-003241 was briefly recorded as a ditch pouring into the Kilarc Main Canal. It was re-recorded as the North and South Canyon Creek ditch, with a total of eight features." when the previous recordation number appears in Table E.2.8-1 (the prior section of the report) and a new number has been assigned and the feature identified as 482-12-10H in Table E.2.8-2.

Topic 10. Recreation

The Forebay/Reservoir is an outstanding local recreation area. The California DFG stocks the reservoir periodically with catch able trout. There is a picnic area, tables, BBQ stands, vault toilets, trash collection, hiking, and outstanding panoramic views.

Community members note that removal of the reservoir will force people to go further for wholesome outdoor activity in a time when everyone is trying to be more fuel conservative. Buckhorn Lake - a thriving source of non-migrating fish has already been lost to recreationists, and Kilarc is highly affordable for local residents – the existence of Kilarc Reservoir makes the community more attractive and adds to the value of the town for both visitors and residents who do not have to leave home to enjoy it.

DLSA Section E.4.10.1 Loss of Kilarc Forebay for Recreational Use identifies **PM&E Measure REC-1: Solicitation of Interest to Recreational Operators** – and then proceeds to describe how PG&E is **unable** to implement the measure. An infeasible measure is NOT mitigation for a SIGNIFICANT impact. Page E.4-20, first paragraph concludes "The implementation of PM&E Measure REC-1 [sic – should be REC-2] would help redirect visitors to other regional recreational facilities after the Kilarc Forebay has been decommissioned."

DLSA Section E.3.10 Recreation establishes the impact threshold criterion as "Directly remove or damage existing recreational resources." The "Summary" of impacts does NOT apply the threshold criterion when stating that "no impacts on recreation in the Kilarc and Cow Creek developments are anticipated." PG&E asserts that the Kilarc Forebay and Picnic Area would no longer be accessible to the public after decommissioning; PG&E ignores in the DLSA that the Forebay is proposed for removal all together.

The community asserts that the proposed mitigation is INADEQUATE to reduce a real impact, as measured by PG&E's own threshold criterion, to a less-than-significant level. Under NEPA, Project Alternatives MUST be considered and an EIS must be prepared before a project may proceed with an UNRESOLVED SIGNIFICANT UNMITIGATED IMPACT.

Topic 11. Aesthetics

The path along the canal provides access to beautiful views, especially in the fall with beautiful colors and the diversion dam full of water. The public views of 3 mountain ranges from the reservoir are likewise refreshing.

DLSA Section E.2.11.3 Visual Sensitivity notes at the bottom of the first paragraph, "Aside from [sic – should be "After] fishing, sightseeing was the second most popular activity noted by participants in the 2007 Recreational Resources Report." Earlier, in the

2nd paragraph of Section E.2.11.2 Landscape Character and Scenic Quality, the text states "Views to the south and east of the Kilarc Forebay provide high-country views of Lassen Peak and Lassen National Forest. To the north and west of the Kilarc Forebay, distant views of the peaks in the Shasta National Forest can be seen, but are in some places partially obscured by vegetation. The colors of the region vary according to season and location."

But, the analysis did not proceed to utilize Key Observation Points (KOPs) to incorporate the desirable views from the perspective of recreationists "of existing *landscapes* [italics added] and Project facilities from Project-related recreation areas and public travel routes" but instead focused on the Project facilities alone. Although the threshold criteria established in DLSA Section E.3.11 included "Substantially degrade the existing visual character or quality of the sites and its surroundings" because PG&E limited the analysis to KOPs 1 and 2, rather than the distant peaks or views from the path along the canal, there was no opportunity to apply this criteria and thus, in Section E.3.11.4 "Based on the evaluation of potential impacts presented in the preceding section," the DLSA erroneously concludes no impacts on aesthetic resources are anticipated when in fact there would be a SIGNIFICANT UNMITIGATED impact to the recreationist population that would no longer be able to view such surroundings.

Topic 12. Land Use

With the hydropower project in place, the human population has grown with potentially hazardous wildlife meeting their own needs at a safe distance. The community fears that mountain lions and other predators may seek ponds on grazing and residential properties and create a SIGNIFICANT conflict with people and domestic animals. PG&E makes no mention anywhere in the DLSA of this issue.

DLSA Section E.4.1.2.1 Conflicts with CAL FIRE's Fire and Resource Assessment Program states that there could be conflicts only during construction activities. However, if the Kilarc Reservoir were removed, it would no longer serve as a water resource available for helicopter bucket refilling to suppress wild land fires in the area. The local fire company supports retention as this has helped in controlling numerous fires. Removal of the Kilarc reservoir must be characterized as a SIGNIFICANT adverse effect for which mitigation must be defined.

PG&E stated in its March 10, 2008 Solicitation of Interest for Operation of Kilarc Forebay as a Recreation Facility that 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 […] to continue operations of Kilarc Forebay for recreational purposes.

Stewardship Council Recommendations (presented in Draft June 2007, LCP Volume II, page CB-12) include 6 objectives, most of which depend on leaving facilities in place

rather than dismantling. "The Stewardship Council recommends that the land and land uses at the Kilarc Reservoir Planning Unit be preserved and enhanced by focusing on the importance of the recreation resources to the local community and the need to provide ongoing protection to natural and cultural resources. In presenting the Recommended Concept provided here, our objective is to enhance the recreation experience at Kilarc Reservoir in coordination with any decommissioning activities while also enhancing biological resources and ensuring protection of cultural resources." Dismantling the facilities will create a SIGNIFICANT conflict with Stewardship Council objectives and recommendations.

The Community of Whitmore as well as surrounding Communities, the County of Shasta, and all stakeholders aware of the potential for decommissioning, are for retention. This has been shown in petitions and supporting signed flyers distributed in local papers. The Shasta Historical Society wants the 105 year old Power Station built by Italian stone masons preserved.

Comments of Whitmore Community Stakeholders
Raised at October 29, 2008 Meeting

1. About the vegetation, old-growth timber – 100-yr-old trees expecting water from that to supply their needs (speaker been in timber business for years), believes area would dry up w/in 20 yrs, in addition to concern w/fire – been addressed? Only been in Whitmore 7 yrs., loves area, knows everyone does…

2. Volunteer @ Shasta Historical Society, w/husband up at Kilarc every chance they get – shares 3-ring scrapbook; @ Walmart 2 yrs ago, everyone who came, saw poster, didn't have to ask twice to sign petition to Save Kilarc; weekends, takes leisurely walk up canal except over tunnel hill, beautiful colors, diversion dam full w/water…worth going up there just to see, so beautiful, do so before weather turns…

3. Seep provides spring, no way to know until they shut it off if domestic water supply will disappear (as occurred w/construction at Whiskeytown),

4. Article in Shasta Historical Society newsletter re: In the 20s through at least 1953, description by Millie Cochran-St. John – social life at powerhouse, had buildings that were torn down

5. Ecology/Environment – PG&E supposedly surveyed, total 5 days not sufficient; called Fish & Game, found some bald eagles present but wouldn't be affected. Our concerns – things HAVE changed in 100 years, there are not other water sources…FERC so busy, will trust PG&E unless told what is being omitted

6. Original reason for tearing down was for fish to go upstream, but that is ludicrous, there are no fish and even if there were, there is no habitat, and Davis Hydro has a better idea.

7. Wildlife seeking ponds – hazard to residents.

8. Cow Creek will still exist – what about eagles, good news & bad news; not as old as dam/reservoir, only migrating winter populations staying in valley until the 60s, one pair nesting at Lake Britton, not acknowledged, until So. Cal, wiped out by DDT, hunting, eggs stolen from nests valued in foreign countries…none at this reservoir, because of building Whiskeytown & Shasta Lake, population moved here for our enjoyment…good news, when they do nest, hunt any body of water they can…a lot more fish are available; nonetheless, the more we protect the eagles, the more they populate down to the valley – Kilarc gives them the room to disperse, more room for youngsters and juveniles, important to support overflow of juvenile population; not historically there, not documented now, there is an osprey nest – not traditional, but they do feed there, as do herons…if you save one bald eagle, 2 chicks, taken off endangered list but still protected…delisted too quickly, 60s & 70s and still need to become established, would not be here without the lakes, reservoirs, ponds

9. What about bats? Overnight displacement is too rapid, not correctly addressing.

10. Underestimating impact, period, fish provide food for Pelicans down in winter, migratory birds passing frequent – Whitmore is a wildlife "restaurant" for migratory birds, swans, etc.

11. So much water, will not impact a lot of other species besides birds

12. Eagles, etc. make Whitmore a very attractive place to live (for humans) – not just Bald Eagles, Golden Eagles been here forever, also Peregrin Falcons like cliffs.

13. Lost great grey owl, prolific in Oregon – worry about losing habitat with fires, as other mentioned could lose trees for lack of water.

14. Turtles and porcupines are disappearing since 1960s.

15. Back to the fish – all of the efforts to stop hydropower have been on behalf of the fish agencies; since March 2005, even they now say NOT spawning in local streams that is problem, critical habitat extends up to Whitmore Ranger Station and Whitmore Falls, already indicated salmon will not get over falls…

16. Actually cooling water, 2-degrees argument, still goes down – conspiracy theory; some kind of deal w/first license up for renewal…political trade, want hydro other places – could profit more easily… summary: NMFS/CDFG taking hard line, no dams downstream, they want it back, PG&E sees 3 MW here and relicensing 3,000 MW w/same people elsewhere – they're happy to give back the 3 MW…

17. Walked creek, no good fish habitat – more in ditch than up the creek, rock gravel bottom in sections – anyone caught any steelhead? Nothing to catch…pioneer family up there says no baby fish no nothing

18. Fisheries agencies want South Cow, great spawning there – there is nothing that says Kilarc can't remain and at the same time do something completely different on South Cow; ranchers there are less interested, waiting for other shoe to drop – Davis Hydro focusing on Kilarc, although will work with others if requested. Note taker was requested to put down that South Cow, w/USFWS habitat study commencing, should be addressed separately

19. What fish are currently in bypassed reach? Planted fish or natives?

20. Hydrology – water supply: old growth trees, families' wells, springs, wetlands up there (in ditchway, groundwater all over downstream property), wetlands from seepage and ditch overflow gates/leaks, around reservoir

21. Hypothetical – like Two Ponds, where does water come from – where is recharge if not from Kilarc? How much does it support, who does it support…105 years, now properties depend on recharging; wells dry up by end of summer…

22. Concern, subsidence – water takes up space, fills in, if disappears, land will drop.

23. Kilarc 3rd – Volta, Inskip, first…smelters depleting fuel on hills, needed power (1899-1901 to Keswick, Kilarc sent to Bully Hill) – whole system is historically important to the development of Shasta County

24. Fire Protection – State of CA, $$, fire retardant OK – animals moving before the fire gets there, grass grows through it, etc.

25. Recreation – to not have reservoir, don't have Buckhorn; forcing people in time when trying to be more fuel conservative, to go further for wholesome outdoor recreation, affordable for people here, makes community more attractive and adds to value of town, not forcing residents to leave home to enjoy it.

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PG&E Draft License Surrender
Application Comment
Workshop
October 29, 2008

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The following meeting attendees and others verified the accuracy and facts contained in the meeting transcript and provided the additional input and comments noted:

1. Sandy Winters – also contributed to and reviewed the issues associated with Cultural Resources (topics 8 and 9) in the preceding cross-reference attachment

2. Earl & Joan Wetmore – were unable to attend the October 29 meeting but have added the observation that the original reason for bringing Canyon Creek spring water to the Kilarc Canal was to keep the Kilarc Canal from freezing in the winter because spring water is naturally warmer at that time. All the springs checked were basically the same, 2-3 degrees different at most. Temperature measurements were taken and submitted, along with air temperature, from upstream and downstream of the powerhouse, and further up the Kilarc Canal. The water was colder after it came out of the power plant than before it reached the power plant. The sun comes down hard on the creek and its rocks, where it can't reach the canal – some of the rocks in the creek get so hot you can't sit on them. (April 27, 2007 data: air temperature 88-degrees, readings taken between 4:45 and 6:10 p.m. – at diversion: 53-degrees, temperature rose only 1 degree by the time water arrived at Kilarc Forebay; temperature rose 5 degrees in natural channel by the time water arrived above the discharge from the powerhouse – the powerhouse discharge caused the water in the creek below the powerhouse to decline 5 degrees from the diversion temperature (e.g. from 53 degrees to 48 degrees), during a time when water temperature is critically high for the sensitive anadromous fish species downstream.

3. Linda Barneby was unable to attend the October 29 meeting, but reviewed the above list of comments and confirmed that she had seen Osprey fishing at Kilarc reservoir.

4. Maggie Trevelyan was unable to attend the October 29 meeting, but reviewed the above list of comments and confirmed that she is especially concerned about ground water and the hydrology concerns expressed in the below prepared list of issues.

5. Ruth Patrick, Kathy Roth, and Carla Winstear were all unable to attend the October 29 meeting, but reviewed the above list of comments and confirmed that they share the same concerns.

6. Dee & Spencer Allen attended the October 29 meeting and confirmed that the above list of comments reflects an accurate transcript of the concerns raised by Whitmore citizens.

7. Lee Peak did a 4-wheeler tour of the drainage area north of the Kilarc Reservoir and western end of the canal using the DLSA Figure E.2.6-2 Map 1 Old Cow Creek Study Area, Special Status Terrestrial Species Observed during 2003 and

2008 Surveys, and he observed that the alignment for Spillway No. 3 upstream of the spring-water supply for the residential property below is totally inaccurate (it does not in fact run uphill as the contour lines are correct).

Prepared List of Whitmore Community Stakeholders' Issues
Submitted at October 29, 2008 Meeting

ECOLOGY

There has been no known impact on the environment in the 104 years of operation. Fish, Wild Life, Riparian

HYDROLOGY

All of the area stakeholders rely on wells, or springs for their household water. No study of ground water has been conducted since 1984 and the results were that it was marginal. Many homes have been added since that time.

ANANDROMOUS FISH

A major road block to approval of relicensing Kilarc is the spawning of anandromous fish. There are no studies showing these species (Salmon & Steelhead) have ever spawned in the area above Whitmore falls, a natural barrier well below the Kilarc facility. Recent communication from Howard Brown of NMFS to M. Accituno of Entrix, July 16, 2008 states: "Critical habitat for Steelhead extends upstream to near the Whitmore Range Station and Whitmore Falls". Salmon have never been considered to spawn above the falls.

WILD LIFE

There is much wild life that inhabit the Kilarc Forebay: Bald Eagles, Osprey, Swallows, Water Snakes, Salamanders, Deer, and smaller animals. It is on the Pacific Flyway and is a small stopping place for Waterfowl. Ducks have even raised their ducklings there and have been observed teaching them to fly.

RECREATION

The Forebay/Reservoir is an outstanding local recreation area. The California DFG stocks the reservoir periodically with catch able trout. There is a picnic area, tables, BBQ stands, vault toilets, trash collection, hiking, and outstanding panoramic views.

FIRE PROTECTION

The local fire company supports retention as the reservoir is a source of water available for helicopter bucket refilling to suppress wild land fires in the area. This has helped in controlling numerous fires.

STEWARDSHIP COUNCIL GOALS

The Stewardship Council is chartered to divest the associated PG&E property. Yet, destroying these facilities before the Stewardship Council can complete their plans for divestiture is counter productive. PG&E has been authorized Millions of dollars (ratepayer money) to destroy the very entities that they are working to establish for connecting California youth with the outdoors. Millions more could be spent trying to replace what already exists.

LOCAL SUPPORT

The Community of Whitmore as well as surrounding Communities, the County of Shasta, and all stakeholders aware of the potential for decommissioning, are for retention. This has been shown in petitions and supporting signed flyers distributed in local papers. The Shasta Historical Society wants the 105 year old Power Station built by Italian stone masons preserved.

Document Content(s)

Thomas "Glenn" Dye
Chairman "Save Kilarc" Committee
Whitmore, CA www.savekilarc.org

March 1, 2009

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

Re: Statutory Background for Requiring an EIS for P-606 License Surrender

Dear Ms. Bose:

At the end of this month, PG&E will be submitting for FERC consideration its P-606 License Surrender Application. PG&E has been allowed two years for the development of this document, which time they have spent continuing to ignore input from the local community stakeholders. Concerns with the proposed dismantling of the Kilarc Development facilities have been expressed by a broad base of community members and our elected representatives, with the latest correspondence by each party (various parties have written many times) filed with the FERC (and available at http://frontiernet.net/~tdye526780/vision/community.htm or by following the links on the expanded www.savekilarc.org website to Our Vision for the Future of Kilarc and thence to "Our Community Writes") as follows:

February 12, 2009 - Jim & Linda Gow
February 12, 2009 - Michael Mogler
January 30, 2009 - Marlene Joslin
December 11, 2008 - Glenn Dye
November 7, 2008 - Laura Carnley for Whitmore Community Stakeholders
May 5, 2008 - Tom Kamp
April 25, 2008 - Maggie Trevelyan
December 10, 2007 - Art Tilles for the Whitmore Volunteer Fire Department
September 21, 2007 - Earl & Joan Wetmore
Elected Officials Representing Community Interests
January 11, 2008 - U.S. Senator Dianne Feinstein
October 26, 2007 - U.S. Congressman Wally Herger

Unless PG&E concedes that the Kilarc Development facilities should not be dismantled in the meantime, the members of the Save Kilarc Committee and the community it represents are convinced that an Environmental Assessment (EA) of the proposed project will not be legally sufficient, and an Environmental Impact Statement (EIS) must be prepared.

Statutory Background[1]

The National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321-4347, is our "basic national charter for the protection of the environment." 40 C.F.R. § 1500.1. NEPA's fundamental purposes are to guarantee that: (1) agencies take a "hard look" at the environmental impacts of their actions by ensuring that they "will have available, and will carefully consider, detailed information concerning significant environmental impacts;" and (2) "the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

To accomplish these purposes, NEPA requires all agencies of the federal government to prepare a "detailed statement" that discusses the environmental impacts of, and reasonable alternatives to, all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). This statement is commonly known as an environmental impact statement ("EIS"). *See* 40 C.F.R. Part 1502. An EIS must provide a "full and fair discussion of significant environmental impacts" of a proposed action, "supported by evidence that the agency has made the necessary environmental analyses." *Id*. at § 1502.1. A limited discussion of impacts is permissible only where the EIS demonstrates that no further inquiry is warranted. *Id*. at § 1502.2(b).

To determine whether the effects of an agency action may "significantly" affect the environment, thus requiring preparation of an EIS, an agency may first prepare an environmental assessment ("EA"). 40 C.F.R. § 1501.4(b). The objective of an EA is to "[b]riefly provide sufficient evidence and analysis for determining whether to prepare" an EIS. *Id.* at § 1508.9(a)(1). If the EA indicates that the federal action "may" significantly affect the quality of the human environment, the agency must prepare an EIS. 40 C.F.R. § 1501.4; 42 U.S.C. § 4332(2)(C). *See Kern v. United States Bureau of Land Mgmt*., 284 F.3d 1062, 1066-67 (9th Cir. 2002). "An agency's decision not to prepare an EIS will be considered unreasonable if the agency fails to supply a convincing statement of reasons why potential effects are insignificant." *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998).

The threshold for requiring preparation of an EIS is low. *See Natural Resources Defense Council v. Duvall*, 777 F. Supp. 1533, 1537-38 (E.D. Cal. 1991) (noting that "the [Ninth] Circuit has established a relatively low threshold for preparation of an EIS") (citations omitted). The Ninth Circuit has stressed that the evidence regarding the significance of the impacts need not be conclusive in order to compel the preparation of an EIS. Rather,

[1] Copied from COMMENTS on Draft Environmental Assessment, DeSabla – Centerville Project (FERC No. 803), Docket No. P-803-068, Applicant: Pacific Gas & Electric Co., Filed by: Chris Shutes, California Sportfishing Protection Alliance; Allen Harthorn, Friends of Butte Creek; Kelly Catlett, Friends of the River, Dave Steindorf; American Whitewater; and Cindy Charles, Golden West Women Flyfishers

> [A]n EIS must be prepared if substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor. The plaintiff need not show that significant effects will in fact occur, but if the plaintiff raises substantial questions whether a project may have a significant effect, an EIS must be prepared.

LaFlamme v. FERC, 852 F.2d 389, 397 (9th Cir. 1988) (citations omitted).

Level of analysis under NEPA

The need for an EIS on this project is an issue for which ample justification has been provided in the November 7, 2008 written comments of Community Stakeholders (FERC accession no. 20081110-5005, copy also available at www.savekilarc.org as referenced above), for PG&E to revise its Draft License Surrender Application. As noted on page 4, under item 2 of these comments, "The concerns raised by the community have NOT been addressed, and the burden of proof should not be on the community to determine PG&E's rationale for dismissing significant issues." FERC's regulations provide that an EIS must be completed for major federal actions that significantly affect the quality of the human environment. 18 CFR 380.6(b)[2] The assertion that the manner in which PG&E proposes to surrender this project will not significantly affect the environment is untenable. As noted in the cover letter to the Whitmore Community Stakeholders' comments, a determination of whether the impacts of this project are significant, thus requiring the preparation of an EIS, includes a consideration of

- Loss of local recreation that is especially suitable for youth and handicapped
- Destruction of a historic resource
- Water supply impacts from loss of groundwater recharge to springs and wells
- Loss of fire suppression capability puts our community and natural resources at risk
- Downstream water quality impacts on endangered fish
- Impacts to wildlife and natural resources, including wetlands and potentially endangered species
- Potential hazard of dangerous wildlife seeking water on residential and ranch properties
- Deterioration of local economy and property values with disruption to ecological balance and community benefits that have evolved over 100 years with the project

And, finally, Steelhead trout would also benefit from the Community's proposed alternative – it is NOT necessary to dismantle the historic Kilarc Diversion, Canal and Reservoir to save this endangered species.

[2] Ibid.

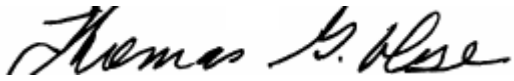
Alternatives considered under NEPA[3]

It is well established that the discussion of alternatives is the "heart" of the NEPA process. 40 C.F.R. § 1502.14; *Ctr. for Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). NEPA requires agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). Such an analysis must "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed project in order to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. § 1502.14(a). The existence of a viable but unexamined alternative renders an environmental impact statement inadequate. *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1994).

The lack of alternatives presented by PG&E is unfortunately characteristic of an approach PG&E takes repeatedly when its hydropower licenses come up for renewal – whether PG&E decides to pursue a new license, or, as in this case, ultimately decides to surrender its license. The alternatives presented are limited to small variations on the proposed action. Worse in this case, PG&E preemptively proposed its alternative to the powerful resources agencies and environmental groups for rubber-stamping, to make it impossible for other voices to be heard or considered before the FERC is presented with a "consensus" of all parties that PG&E does not dare to ignore. PG&E erroneously concludes that there can be no "no action" alternative because they must surrender their license. While it is true that the license must be surrendered, the "no action" alternative would in fact be to surrender the license without dismantling the facilities – or, "locking the door and walking away" as Mr. TJ Lovullo of your office stated when he came to speak to our community in January of last year.

We are hopeful that the FERC will make it clear to PG&E that continued refusal to pursue a consensus-based process that includes community stakeholders will not result in approval of their alternative as proposed. We are similarly hopeful that the FERC will continue to be pro-active, as you were in sending Mr. Lovullo to speak to our community in the middle of the period when PG&E should have been considering community input to the DLSA, even though the FERC is not required to be active at this stage in the process.

Sincerely,



Thomas "Glenn" Dye
Chairman "Save Kilarc" Committee
Retired Registered California Professional Engineer

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[3] Ibid.

Document Content(s)

Parks, Jeff@Waterboards

Subject: FW: Cultural Resources Comments Relevant to FERC P-606 (Kilarc) Water Quality Certification
Attachments: 20100329prnP606ShastaHist-5037(23604642).pdf; 20111121P606Sec106Review-5247(26583672).pdf; 20111121prnP606Sec106Review-5247(26583672).pdf

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From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 12, 2013 4:04 PM
To: Parks, Jeff@Waterboards [private]
Cc: [private]
Subject: Cultural Resources Comments Relevant to FERC P-606 (Kilarc) Water Quality Certification

Jeff - Attached are comments prepared in collaboration with Sandy Winters as a representative of the Shasta Historical Society, documenting in FERC Accession Nos. 20111121-5247 and 20100329-5037 that PG&E's analysis accepted by the FERC includes a grossly distorted assessment of the project Cultural Resources to justify a determination of no significant impact from their demolition.

KC Hydro
a collaboration of Davis Hydro LLC
& Sackheim Consulting
5096 Cocoa Palm Way
Fair Oaks, CA 95628

March 26, 2010

Mr. John Fowler
Advisory Council on Historic Preservation
Attn: Cheryl Foster-Curley
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 809
Washington, DC 20004

Milford Wayne Donaldson, SHPO
c/o Susan Stratton
Office of Historic Preservation
1416 9th Street, Room 1442-7
Sacramento, CA 95814

Re: Section 106 consultation; application for surrender of license for the Kilarc-Cow Creek Project (FERC No. 606)

Dear Messrs. Fowler and Donaldson, Ms. Stratton and Ms. Foster-Curley, and Representatives of Native American Tribes[1]:

We are intervenors in the subject Federal Energy Regulatory Commission (FERC or Commission) proceeding and have been parties to submission of the attached comments on the Pacific Gas and Electric Company (PG&E)-sponsored *Cultural Resources Inventory and Evaluation for the Kilarc-Cow Creek Hydroelectric Decommissioning Project, FERC No. 606, Shasta County, California*[2] and Section 106 consultation that has occurred in this proceeding.

In the attached letter dated April 29, 2008, we requested that "the Commission NOT designate PG&E as Non-federal representative" identifying that "The justification for denial of the above requests includes the fact that PG&E has consistently demonstrated a bias that prejudices the consideration of project alternatives as required under the National Environmental Policy Act. PG&E has stated repeatedly that "PG&E looks

[1] Native American Tribes to whom the letter from the Federal Energy Regulatory Commission (FERC) directed an undated letter posted to the FERC eLibrary as Accession No. 20100322-0013 (e.g. 13th document dated March 22, 2010 per the yyyymmdd numbering convention) are similarly provided a copy of this letter as a courtesy, although the authors of this letter do not presume to comment on other than the referenced non-native issues identified in this letter.
[2] Referenced excerpts from subject document are also attached.

forward to working with the Commission and other stakeholders on the decommissioning of the Project," where "decommissioning" is defined by PG&E as DISMANTLING facilities that many stakeholders oppose dismantling. Davis Hydro has promulgated Alternatives to Save Kilarc and Cow Creek Facilities, concurrently with PG&E's release of a Preliminary Proposed Decommissioning Plan dated September 10, 2007."

By letter to PG&E dated November 7, 2008,[3] the Whitmore Community Stakeholders commented on the version of the Cultural Resources Report found in PG&E's Draft License Surrender Application, specifically focusing on the analysis pertaining to recordation of the Kilarc hydroelectric system (excluding the powerhouse), including two sequential text pages (unnumbered) and pages 1-30 of the Department of Parks and Recreation Primary Record for Resource Name or #: 482-12-07H, Other Identified: Kilarc Canal, contributing to the finding, supported by the Office of Historic Preservation Determination of Eligibility and Finding of Effect for the Kilarc-Cow Creek Hydroelectric Decommissioning Project (FERC No. 606), by letter dated November 4, 2008[4], that "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."

We DISPUTE the concurrence with the PG&E recommendation for a finding of non-eligibility based on the shoddy documentation and biased analysis found in the document preceding the November 2008 determination. PG&E has corrected the errors identified by the Whitmore Community Stakeholders but failed to reconsider its findings. We bring to your attention the following changes and current report contents that begin to reflect the importance and integrity of the Kilarc hydroelectric system, with which we are more familiar, without prejudice against the performance of a similar re-analysis and determination for the Cow Creek system.

First, the report was corrected to reflect that the Kilarc Canal is an historic, NOT an archaeological resource (that happens to continue to serve its original function to this

[3] Referenced excerpts from subject letter are also attached.
[4] Subject letter and PG&E's transmittal thereof to the FERC are also attached.

day). "A total of 44 features were documented along the canal system between the main diversion dam on Old Cow Creek and the Kilarc Powerhouse."[5] The first three features described are significant and from the description would appear to be if not original, still historic construction, which remains serviceable with no identified modifications. "Feature 3 consists of the concrete flume sections that are present at irregular intervals along the Kilarc Canal system en route to the Kilarc forebay. The concrete flume sections are similar in construction, with a squaredoff U-shape in cross-section and are generally 4 to 6 feet wide, 3 feet deep and with 3 to 6 inch thick walls. Each section occurs in varying lengths along the course of the canal." Please note that Davis Hydro has prepared maps of habitat characteristics of the flumes (and consequently construction materials), while the GANDA historical report minimizes the extent of the concrete and earthen flume sections by combining them in a single brief feature description, while calling out separately (e.g. Features 19 – 21, 23 – 25, 28 and 31) each "section of modern wood and metal flume." The modern wood and metal flumes exist only where the canal crosses side-canyons and has required a non-concrete construction and more substantive maintenance, while the concrete flume sections have endured.

Feature 4 is the first characterized as a "modern wood and corrugated aluminum rectangular gauging station shack" with no reference as to the date it was installed or upgraded. We assert that, unless documented, it is not unreasonable to presume that this feature is likely to be more than 50 years old and historic. Furthermore:

- Feature 5 "consists of a small wooden ditch tender cabin. Formerly known as Kilarc Shack 2" where "Most of the floor and foundation have rotted away" but there is ample description of historic features and we presume that restoration of this historic cabin would require fewer resources than its destruction.
- Feature 18 is Kilarc Shack 3, in similar condition.
- Features 9 and 10 are a similar Kilarc Shack 1 and the Canyon Creeks siphon that is original to the project. Features 12 – 14 consist of a tunnel with

[5] Cultural Resources Inventory and Evaluation, Garcia and Associates (GANDA), Kilarc-Cow Creek Hydroelectric Decommissioning Project, March 12, 2009, page 45

wooden entrance and exit works and foot bypass trail, plus an abandoned flume alignment, with no reference to modern features.

- "Feature 16 consists of a large number of metal and concrete constructed drains. These drains occur at irregular intervals along the entire length of the Kilarc canal system."
- Feature 22 consists of an emergency spillway and associated gate valve that may not have been updated, although no documentation is provided regarding the period of its construction.
- "Feature 27 consists of a small wooden ditch tender cabin. This feature was not previously recorded. […]The historic-era artifacts observed include but may not be limited to; "Prince Albert" style tobacco tins, folded side-seam sanitary cans and coffee tins, brick fragments and heavy gauge fencing wire bundles. A 6-millimeter heavy gauge steel wire and 1 inch ceramic insulator have been installed above the entry way of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at other structures (Features 5, 10, 18) recorded along the Kilarc canal system."
- Feature 29 consists of a cross flume constructed of wood with concrete footing, possibly partially or wholly of historic-era construction.
- "Feature 32 consists of a section of modern metal flume that is associated with a series of two short tunnels. The tunnels are cut through solid volcanic tufa stone. The tunnels are likely the historic-era feature; the flume itself is made of modern steel construction and materials."
- Feature 33 consists of a wooden foot bridge/crossing and Features 34 and 35 are Spillway and Gate structures that we presume are all historic, given that none have been highlighted like the others as modern.
- Features 40 and 41 are the original Forebay Spillway and Forebay.
- Feature 43 consists of an historic-era riveted steel penstock and attached (modern/bolted) upright welded penstock vent or surge tower.
- Feature 44 consists of a segment of dry-stacked rock retaining wall.

We ask you, given the now well-documented descriptions above, to please reverse your determination that these are not valuable historic features "due to their lack of integrity."

Twenty-three distinct features described above remain in sufficiently good condition to depict the important history of this area.

Twenty-one numbered features (where individual numbers are in fact assigned to similar features,[6] including numerous short metal flume segments and crossing bridges, plus two minor elements visible in the historic Forebay and on the historic penstock, while the historic features with common characteristics have been combined and assigned only one number) have been modified in recent times.

Unexplored also is the possibility that the first section of the diversion was originally a headrace for a hydraulic mining operation. In the GANDA original report and revision, we never found a discussion of potentially historic features that we brought to the attention of PG&E, as identified in the final attached document. Very old piping found below the diversion works and the large washed faces visible from Old Cow Creek in the general area beyond the first tunnel suggest possible hydraulic mining. Neither of these are definitive as other explanations exist for the piping – such as the extensive gold-era canals on the north side of the Old Cow and earlier siphon piping over to the South and North Canyon drainage.

Your input will be invaluable to saving from demolition the facilities licensed to PG&E, because the FERC can, and we believe will, determine that demolition is NOT a necessary condition of PG&E's license surrender, and in fact would require substantial mitigation. We request that you convey your conclusions based on a revised analysis that takes into consideration the points we have raised when you respond to the FERC's letter

[6] Features 6 – 8 and 17 are modern, three metal flumes and a crossing bridge. Features 11, 15, 26, 30, 36, 38 and 39 also consist of modern metal and wood foot bridge/crossings with wood railing noted for the former. Features 19 – 21, 23 – 25, 28 and 31 each consists of a section of modern wood and metal flume. Feature 37 is described as "a modern metal trash collector mechanism or apparatus" – demonstrating the lack of familiarity of the writer with the common "trash rack" and automation technologies used to screen flowing water and keep the screens clear. Feature 42 consists of a modern metal pier (in the Kilarc Forebay Reservoir) and associated water intake.

requesting you review PG&E's application, and provide your comments and recommendations within 30 days (by approximately April 22, 2010).

Sincerely,

Kelly W. Sackheim, Principal
KC Hydro, a partnership of
Davis Hydro LLC and Sackheim Consulting

Sandra L. Winters, Volunteer
Shasta Historical Society

Attachments

Cc: filed electronically to FERC eLibrary and served to augmented P-606 Service List
Copied to Native American Representatives below:

Redding Rancheria
Attn: Tracy Edwards,
Chief Executive Officer;
and Barbara Murphy, Chair
2000 Redding Rancheria Road
Redding, CA 96001

Roaring Creek Rancheria
P.O. Box 52
Montgomery, CA 96065

Wintu Tribe of Northern California
Attn: Kelli Hayward
3576 Oasis Road
Redding, CA 96003

Madesi Band, Pit River Indians
Attn: Carol Cantrell,
Cultural Resource Representative
P.O. Box 203
Montgomery, CA 96065

United Tribe of
Northern California, Inc
Attn: Gloria Gomes, Chairperson
20059 Parocast
Redding, CA 96003

Pit River Tribe
Environmental Office
Attn: Sharon Elmore,
Cultural Information Officer
37118 State Highway 299 E
Burney, CA 96013

Winnemem Wintu Tribe
Attn: Caleen Sisk-Franco,
Tribal Chair
14840 Bear Mountain Road
Redding, CA 96003

Atsugewi Band, Pit River Indians
Attn: Bill George
P.O. Box 114
Hat Creek, CA 96040

Itsatawi Band, Pit River Indians
Attn: Reitha Amen
18342 Rory Lane
Cottonwood, CA 96002

CERTIFICATE OF SERVICE

I hereby certify that I have on this day served the foregoing document by first class mail postage prepaid or email upon each person designated on the official service list compiled by the Secretary of the Commission in this proceeding.

Dated at Fair Oaks, CA this 27th day of March 2010.

Kelly W. Sackheim

Kelly W. Sackheim, Principal
Sackheim Consulting
5096 Cocoa Palm Way
Fair Oaks, CA 95628

Davis Hydro, LLC.
27264 Meadowbrook Drive
Davis, California 95618
530 753-8864 Fax 530 753-4707
Email: dick@davishydro.com

April 29, 2008

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 – 1st Street, N.E.
Washington, DC 20426-0001

Filed electronically

Re: Kilarc-Cow Creek Hydroelectric Project, FERC Project No. 606
Request that the Commission NOT designate PG&E as Non-federal representative

Dear Secretary Bose:

With regard to Pacific Gas and Electric Company's (PG&E's) letter to you pertaining to "Non-federal representative designation" for subject project, dated April 23, 2008, stamped as filed April 24, and posted on e-library on April 28, 2008, by this letter, you are requested to deny all requests made in that letter.

Specifically, the Commission is requested

1) NOT to authorize PG&E to initiate consultation pursuant to 36 CFR §800.2(c)(4), as described in Section 106 of the National Historic Preservation Act, with the California State Historic Preservation Officer ("SHPO") and others regarding decommissioning of the Kilarc-Cow Creek Hydroelectric Project ("Project"), and

2) NOT to designate PG&E as its non-federal representative pursuant to 50 CFR §402.08 to conduct consultation with the National Marine Fisheries Service and the US Fish and Wildlife Service, including preparation of a biological assessment as necessary to comply with Section 7 of the Endangered Species Act.

The justification for denial of the above requests includes the fact that PG&E has consistently demonstrated a bias that prejudices the consideration of project alternatives as required under the National Environmental Policy Act. PG&E has stated repeatedly that "PG&E looks forward to working with the Commission and other stakeholders on the decommissioning of the Project," where "decommissioning" is defined by PG&E as DISMANTLING facilities that many stakeholders oppose dismantling. Davis Hydro has promulgated Alternatives to Save Kilarc and Cow Creek Facilities, concurrently with PG&E's release of a Preliminary Proposed Decommissioning Plan dated September 10, 2007. These Alternatives were re-released for discussion in January 2008. Updated versions of these Alternatives are logged on the www.kilarc.info website, with the latest dated March 26, 2008.

Thomas LoVullo, one of the FERC representatives who came to discuss the P-606 license surrender

with community stakeholders in January 2008 made it very clear that PG&E is not required to dismantle the project facilities upon license surrender. Davis Hydro, various ranchers, and the community of Whitmore have a vested interest in the future disposition of project facilities. We suggest that there are Alternatives that will both promote anadromous fish restoration and meet community objectives. These Alternatives were not available when PG&E first conducted an evaluation for the disposition of the project. The Alternatives are available now, and should be studied along side the PG&E-proposed Alternative for dismantling.

An objective evaluation of what is best is needed by a disinterested entity. Davis Hydro requests the opportunity to participate in consultation with the resource agencies responsible for preservation of the respective resources under Section 106 of the National Historic Preservation Act and Section 7 of the federal Endangered Species Act.

By letter dated April 24, 2008, addressed to PG&E and copied to the FERC's e-library, Davis Hydro submitted a Statement of Interest in Future Disposition of Kilarc Development Assets following PG&E Surrender of P-606 Hydropower License, by the date requested, in response to both of PG&E's March 10, 2008 Solicitations of Interest for Ownership and Management of Kilarc-Cow Creek Hydroelectric Project (FERC No. 606) property and facilities included in the Kilarc Development.

Davis Hydro continues to develop the Alternatives to PG&E's proposed dismantling plan. Davis Hydro is continuing to develop these plans that will be ready in time for consideration and study against the proposed deconstruction plan. We are gathering preliminary environmental information to support consideration of our plan for approval by the resource agencies. We request that our environmentally preferred Alternative license surrender plan be considered.

Sincerely,

Kelly W. Sackheim

Kelly W. Sackheim
Permitting and Compliance

cc: Rod McInnis
Regional Administrator
National Marine Fisheries Service
501 West Ocean Blvd
Long Beach, CA 90802

Steve Thompson
Regional Director
US Fish and Wildlife Service
2800 Cottage Way
Sacramento, CA 95825

Milford Wayne Donaldson
State Historic Preservation Officer
P.O. Box 942896
Sacramento, CA 94296

FERC P-606 Service List and other parties with whom Davis Hydro is already consulting

Community Stakeholders
info@savekilarc.org
or
c/o Carnley
P.O. Box 177
10471 Blue Mountain Ranch Road
Whitmore, CA 96096
calass@frontiernet.net

November 7, 2008

Stacy Evans, Project Manager
Pacific Gas and Electric Company
Power Generation
Mail Code N11C, PO Box 770000
San Francisco, CA 94117

Re: Written Comments due November 8 for PG&E to revise the DLSA and file the Final License Application with FERC

Dear Ms. Evans:

Members of the Whitmore Community are important stakeholders in the disposition of the Kilarc facilities upon PG&E's license surrender. We have repeatedly been ignored.

Citizen comments and other attachments to this letter demonstrate the significant, unmitigated impacts of your proposed "Decommissioning Plan." The concept for this plan was first introduced to us in March 2007 - after PG&E developed a March 2005 agreement for signature by a group of stakeholders from which the community was excluded. In September 2007, PG&E released a lengthy document describing your plan for review and comment. PG&E then incorporated the same plan, without taking into consideration comments received by the community, into your "Draft License Surrender Application" dated September 4, 2008. The plan, virtually unchanged since it was first conceived by PG&E, would be an unmitigated disaster for the Whitmore Community and is totally unnecessary.

A majority of the community concerns were first raised at your public meeting in March 2007, reiterated in September/October 2007 following the release of your plan to demolish valuable assets at great cost to us ratepayers, and continue to be completely ignored in your latest document.

Our latest comments are cross-referenced to the totally inadequate analysis in your DLSA in the first attachment to this letter. The attachment proves that there would be significant, unmitigated impacts of PG&E's decommissioning plan. These impacts

would be avoided by the feasible alternative to leave all Kilarc facilities in place for future use. Our community, with support from Davis Hydro, is prepared to take responsibility for the facilities PG&E will abandon and fully address in so far as possible the fish issues. The problem remains that PG&E is raising unnecessary obstacles to a win-win future situation.

PG&E states that the net book value of the Project is estimated to be approximately $5 million – and proposes to spend $14.5 million of OUR ratepayer money to destroy it. It makes much more sense for PG&E to donate the facilities, and allocate ratepayer funds authorized by the CPUC to foster the success of future project benefits. PG&E should NOT "be entitled to receive its net investment plus severance damages" (DLSA Section D.2 Amount Payable in the Event of Project Takeover). PG&E should not be compensated because it cannot continue to operate the project cost-effectively. PG&E should not be allowed to stand in the way of ratepayer and community interests.

Significant, unmitigated effects of the proposed dismantling plan, that would be addressed by developing and selecting a project alternative as required under NEPA, include:

- Loss of local recreation that is especially suitable for youth and handicapped
- Destruction of a historic resource
- Water supply impacts from loss of groundwater recharge to springs and wells
- Loss of fire suppression capability puts our community and natural resources at risk
- Downstream water quality impacts on endangered fish
- Impacts to wildlife and natural resources, including wetlands and potentially endangered species
- Potential hazard of dangerous wildlife seeking water on residential and ranch properties
- Deterioration of local economy and property values with disruption to ecological balance and community benefits that have evolved over 100 years with the project

Steelhead trout would also benefit from the proposed alternative – it is NOT necessary to dismantle the historic Kilarc Diversion, Canal and Reservoir to save this endangered species. The Proposed PG&E solution is based on returning fish to an area where they have never been seen, and will be very difficult to get to or grow in no matter whether there is hydro or not.

PG&E indicated that you would not respond to comments provided verbally when you presented your latest document. Therefore, 14 concerned local citizens attended a community meeting (see attached sign-in sheet) on October 29, 2008 to repeat concerns that we do not believe are adequately addressed in the PG&E document. One participant prepared for our meeting by preparing a written list of Pertinent Studies. A dedicated note-taker summarized the issues as they were raised. These concerns expressed repeatedly by our community are presented in the latter attachments.

Please do not ignore the community. A win-win solution can be achieved if PG&E will leave Kilarc facilities in place and support the community even slightly.

Sincerely,

Laura Carnley

Laura Carnley for
Whitmore Community Stakeholders

Attachments: cross-reference of comments to DLSA statements and omissions, lists of pertinent studies and community concerns raised in October 29, 2008 meeting, sign-in sheet of meeting participants and signatures and comments of stakeholders who concur with this letter

Enclosure: Excerpts from DLSA Appendix L, Cultural Resources Report pertaining to recordation of Kilarc hydroelectric system (excluding the powerhouse), including report cover, two sequential text pages (unnumbered) and pages 1-30 of Department of Parks and Recreation Primary Record for Resource Name or #: 482-12-07H, Other Identified: Kilarc Canal

cc: comments@kilarc-cowcreek.com
"Evans, Stacy" SxEf@pge.com
"Nevares, Steven" SAN3@pge.com

Kilarc-Cow Hydroelectric Project
Draft License Surrender Application Comments
c/o Darcy Kremin
2300 Clayton Road, Suite 200
Concord, CA 94520

Filed to P-606 in FERC e-library

any argument to the contrary. Change to an existing, stable environment may result in POTENTIALLY SIGNIFICANT adverse effects that PG&E has failed to even attempt to acknowledge. PG&E has only surveyed resources for a total of 5 days which is completely insufficient to characterize ecosystems that depend on the project features.

Topics 8 and 9. Historical Resources and Archaeological Resources

The community comments only on the Historical Resource, which is entirely public information. However, PG&E has stymied the assessment of its analysis by mischaracterizing historic resources as archaeological, and restricting release of the entire Cultural Report, presumably because of confidential location information for Native American Resources that has been buried in the same report.

5. The Community Stakeholders request that PG&E revise its license surrender application to address the Historical Resources separately from the Archaeological Resources, specifically releasing ALL non-confidential information in the Cultural Report (Appendix L) and more clearly cross-referencing in a single section of the DLSA (as requested in #3 above under General Comments), the findings and justification of the recorded features.

The DLSA provides a nearly 5-page historical context for the project area, of which 2 pages specifically address hydropower. The community also identified that Kilarc was the third powerhouse established in the region to replace wood-burning smelters – the whole system is historically important to the development of Shasta County. In the 20s through at least 1953, buildings adjacent to the powerhouse that have since been torn down served the local social life – and are not reflected in the short summary of the DLSA. The GANDA Cultural Resources Report (which has NO page numbers on the footers – page referenced is opposite Figure 26; the table of contents indicates Figure 27 is on the following page, but it is not) does identify that "Approximately 21 out of the 27 buildings existing at the site in 1919 had been removed by 1997 (PG&E 1979; Camp, Dresser & McKee 1997:4-1)."

The DLSA identified that "All resources identified within the APE were photographed and mapped with GPS equipment." (Page E.2-91) and "A total of seven architectural and historical resources were identified within or adjacent to the APE. All were recorded on Department of Parks and Recreation (DPR) standard forms, mapped and photographed. […] Table E.2.8.2-2 summarizes the architectural and historical resources described in this Draft LSA report." (Page E.2-92 with tables on Page E.2-166 [labeled only as Page 166 in the footer]; The Cultural Report identified as Appendix L to the DLSA was said to include confidential information and therefore was not released publicly. A single hardcopy of the Cultural Report was provided to the Shasta Historical Society.)

Page E.3-28 identifies the impact threshold criterion as "Cause a substantial adverse change in the significance of architectural and historical resources recommended for

eligibility in the NRHP or the CRHR." Given that the Kilarc Main Canal does not even appear as one of the seven architectural and historical resources identified in Table E.2.8.2-2, it becomes impossible to evaluate whether the Kilarc Main Canal meets this criteria. Nonetheless, the same criteria applies for archaeological resources (identified on page E.3-29).

A review of Tables E.2.8-2 and E.2.9-2 reveals that the Kilarc Main Canal (Temporary Number 482-12-07H), that presently serves as the active water conveyance structure delivering up to 52 cfs to the powerhouse is listed only in the latter table of *archaeological* resources.

6. The Community Stakeholders request that PG&E explain why a functioning feature integral to its current hydropower generation was characterized as an *archaeological resource.*

A review of section E.2.9 of the DLSA reflects that NO historical context is provided to support the discussion of historic site types in this section, rather than the preceding E.2.8. It is unclear why the Field Survey Results presented on page E.2-97 within section E.2.9 of the DLSA identify by number the features that appear to be indiscriminately assigned to either Table E.2.8-2 (the Kilarc Powerhouse [site 482-12-06H]) or Table E.2.9-2 (the Kilarc Inlet Canal and associated features [site 482-12-07H]) – except that PG&E does not propose to demolish the Powerhouse and would not be able to demolish the Kilarc Inlet Canal and associated features without mitigation if it were correctly characterized as eligible for listing and therefore a SIGNIFICANT adverse effect of the proposed decommissioning plan.

Table E.4.9-1. Recommendations for Archaeological Resources Identified within the APE provides the first indication of which such resources were deemed NRHP/CRHR Eligible – including only the Temporary Number for each resource, without the corresponding Name/Location. The Kilarc Main Canal was identified in Table E.9-2 with Temporary Number 482-12-07H, that was deemed "Not eligible" and nonetheless received a Recommendation for "No mitigation but avoid historic features where possible." – which appears commendable EXCEPT that PG&E's proposed plan involves complete removal of ALL features.

The GANDA report was consulted to determine WHY the Kilarc Main Canal was deemed "Not eligible" – one full page of text (across two pages, presented in the enclosure) proceed from "In summary, the Kilarc Powerhouse appears to [sic] eligible for the NRHP under Criteria A and C, and the CRHR under Criteria 1 and 3 at the state and local level." followed by the header for "Kilarc Hydroelectric System" that begins "The Kilarc hydroelectric system, including canals, dams, ditch tender cabins, bridges, flumes, siphons, tunnels, spillways, berms, a forebay, and a penstock, constructed in 1903-1904 by the Northern California Power Company, represents a local historic resource that provided hydroelectric power from a water diversionary system constructed throughout the Cow Creek watershed."

NOTE: the text incorrectly refers in the past tense that the LOCAL historic resource PROVIDED hydroelectric power. As described in the DLSA and above, the system is historically important to the development of Shasta County, not simply LOCAL interests (although these local interests clearly merit consideration as well!). And, the system continues to generate hydroelectric power, and according to Davis Hydro and the FERC, has the potential to continue generating following PG&E's license surrender.

The GANDA report concludes that "Although the Kilarc hydroelectric system has important historical associations and engineering significance, the system as a whole lacks integrity, and therefore the Kilarch hydroelectric system does not appear to be eligible to meet the criteria for listing on the NRHP or the CRHR." The GANDA report argues that the removal of associated buildings that were necessary for the many workers employed prior to the automation of the project, and "numerous" changes made to various components of the system, destroys the "integrity of location, design, setting, materials, workmanship and feeling and association" of the system "from an engineering and technological aspect." In short, the GANDA report argues that because PG&E has already destroyed important historic resources, PG&E should not be obligated to preserve the remaining features that ARE historic and highly valued by the community.

Why the "removal of associated buildings" detracts from the integrity of the Kilarc Canal "from an engineering and technological aspect" when the Kilarc Powerhouse (that is geographically closer to the associated buildings that no longer exist) is deemed eligible for listing, is a mystery, again – except that PG&E does not propose to demolish the Powerhouse and would not be able to demolish the Kilarc Inlet Canal and associated features without mitigation if it were correctly characterized as eligible for listing and therefore a SIGNIFICANT adverse effect of the proposed decommissioning plan.

7. The community challenges the finding that the remaining Kilarc hydroelectric system, especially including the water conveyance structures, is NOT eligible for listing, as supported by the evidence provided in the corresponding record (scanned copy attached – of 44 features photographed along the 3+ mile canal, only a dozen steel flumes and various bridges over the flume are deemed "modern"). The community requests a comprehensive revision to the analysis in the GANDA report and summary of findings presented in the DLSA to reflect that the Kilarc hydroelectric system, e.g. the Kilarc Canal and Forebay and associated structures, ARE features eligible for listing in the NRHP and the CRHR.

It is similarly unclear why, in the final paragraph on page E.2-97, within section E.2.9 of the DLSA, PG&E states "Site P-45-003241 was briefly recorded as a ditch pouring into the Kilarc Main Canal. It was re-recorded as the North and South Canyon Creek ditch, with a total of eight features." when the previous recordation number appears in Table E.2.8-1 (the prior section of the report) and a new number has been assigned and the feature identified as 482-12-10H in Table E.2.8-2.

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 94177

April 20, 2009

The Honorable Kimberly D. Bose, Secretary
THE FEDERAL ENERGY REGULATORY COMMISSION
888 First Street, N.E., Docket Room
Washington, D.C. 20426-001

Re: Submittal of *Determination of Eligibility and Finding of Effect for the Kilarc-Cow Creek Hydroelectric Decommissioning Project (FERC No. 606)* Letter

Dear Secretary Bose:

Enclosed is the requested copy of the November 4, 2008 letter from Mr. Milford Wayne Donaldson, California State Historic Preservation Officer (SHPO) to Ms. Stacy Evans, Pacific Gas & Electric (PG&E) Project Manager, documenting SHPO concurrence on the Determination of National Register of Historic Places Eligibility and Finding of Effect of the identified cultural resources for the Kilarc-Cow Creek Hydroelectric Project (FERC No. 606).

As requested by the Federal Energy Regulatory Commission (FERC), PG&E is submitting this additional filing of the attached letter for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606, License Surrender Application (LSA).

PG&E looks forward to continually working with FERC and other interested parties in the license surrender process.

If you have any questions regarding the LSA and attached letter, please contact me at (415) 973-4731.

Respectfully yours,

Stacy Evans
Project Manager
Attachment: November 4, 2008 Letter from SHPO

cc: Carlisa Linton-Peters
Jade Alvin

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
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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,

Stephen D. Mikesell for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

CULTURAL RESOURCES INVENTORY AND EVALUATION FOR THE KILARC-COW CREEK HYDROELECTRIC DECOMMISSIONING PROJECT, FERC NO. 606, SHASTA COUNTY, CALIFORNIA

Prepared for:

Pacific Gas and Electric Company

Prepared by:

GANDA

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Reviewed by:
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March 12, 2009
J482/12.1

other diversion on Mill Creek was also recorded (482-12-09H). P-45-003241 was briefly recorded as a ditch pouring into the Kilarc Canal. It was re-recorded as the North and South Canyon Creek ditch, with a total of eight features. A new site record has been prepared for 482-12-11/H, an older discovery of a prehistoric lithic scatter plotted at the NEIC, and for which no formal record existed.

All DPR forms are provided in Appendix C. Table 2 below summarizes the cultural resources described in this report.

Table 2: New and Updated Cultural Resources

Temporary Number	State Number	Site Type	Property Type	Name/Location	Attributes
482-12-01H	Not Available	Historic	Water systems	S. Cow Creek Powerhouse	Hydroelectric power-generation
482-12-02H	CA-SHA-1764H	Historic	Water systems	S. Cow Creek canal	Diversion, ditch, bridges, forebay, penstock
482-12-03H	None	Historic	Settlement	Cow Creek caretaker's cottage	Housing foundations, utility buildings, landscape, refuse deposits
482-12-04	None	Prehistoric	Lithic scatter	Not for Public Release	Obsidian flake scatter
482-12-05/H	None	Multi-component	Lithic scatter, refuse deposit	Not for Public Release	Obsidian flake scatter, historic artifact scatter
482-12-06H	None	Historic	Water systems	Kilarc Powerhouse	Hydroelectric power-generation
482-12-07H	None	Historic	Water systems	Kilarc canal	Diversion, ditch, bridges, wood shacks, forebay, penstock
482-12-08/H	None	Multi-component	Obsidian flake, refuse deposit	Not for Public Release	Obsidian flake, historic artifact scatter
482-12-09H	None	Historic	Water systems	Mill Creek ditch	Diversion, ditch
482-12-10H	P-45-003241	Historic	Water systems	N. and S. Canyon Creek ditch	Diversion, ditch, siphon
482-12-11/H	*No record* (Foster report THP #2-89-97-Sha	Multi-component	Lithic scatter, water systems	Not for Public Release	Obsidian flake scatter, historic improved spring

Site 482-12-01H

This historic resource consists of the South Cow Creek Powerhouse, described at the end of this section.

CA-SHA-1764H-(Site 482-12-02H)

This historic resource consists of the South Cow Creek Canal. It was originally recorded as CA-SHA-1764H by Laurence H. Shoup in 1989 (Shoup 1989). According to Shoup:

> "This historic resource consists of a historic timber crib diversion dam and related features. The main dam is the second one known to have been constructed at this location. The original dam was built in 1907 and was a rock dam. The present dam was built in the 1920's. The main South Cow Creek Diversion Dam is a timber crib dam backed by rock and concrete. Metal plates have been bolted to

Figure 5. Basalt biface platform.

An additional three obsidian flakes were found outside the recorded site boundary at the bottom of the road near the canal. It is likely that these flakes were washed down the road by rainwater from the graded area upslope.

Site 482-12-06H

This historic resource consists of the Kilarc Powerhouse and is described at the end of this section.

Site 482-12-07H

This historic resource consists of the Kilarc Canal system that includes the Kilarc Main Diversion Dam, the approximately 3.65 mile long canal and flume system, the 4-acre Kilarc forebay (reservoir) and the penstock that collects and delivers water to the Kilarc Powerhouse. A total of 44 features were documented along the canal system between the main diversion dam on Old Cow Creek and the Kilarc Powerhouse.

Feature 1 - Kilarc Main Diversion Dam
Feature 1 consists of the main water diversion dam and spillway that diverts water into the Kilarc Canal from Old Cow Creek. The spillway is a 10 foot high and 20 foot wide concrete wall perpendicular to Old Cow Creek that artificially raises the streambed water level. The top of the wall is 2 feet thick. The diversionary structure and dam is a V-shaped concrete structure which serves to divert and control the flow of water from the natural stream bed of Old Cow Creek to the opening of the main flume and aqueduct for the Kilarc water system. The concrete diversion structure is located on the southwestern side of the spillway which acts to force water into the head of the canal system. In this location the water is channeled into an artificial creek bed approximately 12 feet wide, flowing in a torrent towards a secondary spillway and gate valve (Feature 2) and intake into the concrete flume (Feature 3). The mouth of the diversionary structure is a water gate that is actuated by a crank and chain-driven flap. The diversion structure measures 6 feet wide by 10 feet tall.

Feature 2 - Spillway and Diversion
Feature 2 consists of a spillway and dam associated with the main water diversion and located a short distance downstream of the main water diversion (Feature 1). The spillway consists of a concrete dam about 12 feet long by 18 inches wide by approximately 6 feet high and associated retaining wall measuring roughly 15 feet long by 18 inches wide. Incorporated into the spillway is a 6 by 3 feet concrete cistern or water basin. The

mouth of the diversionary structure is a water gate that is actuated by a crank and chain-driven flap. This is the location of the intake into the first concrete flume on the Kilarc canal.

Feature 3 – Concrete Flumes
Feature 3 consists of the concrete flume sections that are present at irregular intervals along the Kilarc Canal system en route to the Kilarc forebay. The concrete flume sections are similar in construction, with a squared-off U-shape in cross-section and are generally 4 to 6 feet wide, 3 feet deep and with 3 to 6 inch thick walls. Each section occurs in varying lengths along the course of the canal.

Feature 4 - Gauging Station
Feature 4 consists of a modern wood and corrugated aluminum rectangular gauging station shack. The structure measures 6 feet (N-S) by 4 feet (E-W) and is 11 feet tall.

Feature 5 - Cabin
Feature 5 consists of a small wooden ditch tender cabin. Formerly known as Kilarc Shack 2, this feature is located approximately 25 feet south and upslope of the main Kilarc aqueduct. The structure measures 10 feet (E-W) by 12 feet (N-S), has a square plan and a gabled roof. The structure is wood framed with single windows on the west and north sides (cross-pattern sash with 6 panes that are no longer intact) that measure 24 inches wide by 18 inches tall. There is an open doorway on the west face that measures 2 feet wide by 6 feet 6 inches high. The walls, roof and floors are made from 1 by 10 inch fir boards. The roof and exterior walls are covered with vertically mounted split cedar shingles. The interior walls are covered with particle board. The roof covering is corrugated steel sheeting. Most of the floor and foundation have rotted away. A framed 2 foot by 2 foot wood stove footing is present on the floor, offset from the center of the structure with a 7-inch diameter stove pipe vent in the roof directly above it. The entire structure is anchored with round-head wire nails. A 6-millimeter heavy gauge steel wire and 1-inch ceramic insulator has been installed above the entry way of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at other structures (Features 10, 18, 27) recorded along the Kilarc canal system. No associated artifact scatter was observed, though small sections of 7-inch diameter stove-pipe were observed strewn about the interior and exterior of the structure.

Feature 6 - Crossing Bridge
Feature 6 consists of a modern wood crossing bridge. The bridge is constructed of 2-by-8 and 4-by-4 inch lumber and measures 12 feet long and 9 feet wide.

Feature 7 - Metal Flume
Feature 7 consists of a section of modern metal flume.

Feature 8 - Metal Flume
Feature 8 consists of a section of modern metal flume.

Feature 9 - Riveted Penstock
Feature 9 consists of metal siphon made of a 12-inch diameter riveted steel penstock pipe that delivers water into the Kilarc canal system from the North and South Canyon Creek ditch (see P-45-003241 /482-12-10H, Feature 8). The penstock itself has a deteriorating tar-coating and sits on a stacked stone pedestal where it abuts the concrete flume section of the Kilarc canal. The stacked stone pedestal is concrete mortared in 10 thin courses of local stone and measures 2 feet wide (N-S) by 4 feet wide (E-W) by 3 feet tall.

Feature 10 - Cabin/Supply Shack
Feature 10 consists of a small ditch tender cabin or supply shack. Formerly known as Kilarc Shack 1, this feature is located approximately 25 feet south and upslope of the main Kilarc flume, just above Feature 9. The structure rests on an artificially cut pad cut into the 25 degree slope. The structure measures 7 feet (E-W)

by 8 feet (N-S), has a square plan and an angled or sloping half-gabled profile. The pitch of the roof is approximately 10 degrees. The structure is wood framed with a single north-facing window (cross-pattern sash with 6 panes that are no longer intact) that measure 30 inches wide by 30 inches tall. There is an open doorway (hinges intact) on the east façade that measures 2 feet wide by 6 feet 6 inches high. The walls, roof and floors are made from milled 1 by 10 inch fir boards. The exterior walls are covered with vertically mounted split cedar shingles. The interior walls are covered with particle board. Most of the floor and foundation have rotted away. A framed 2 foot by 2 foot wood stove footing is present on the floor, offset from the center of the structure with a 7 inch diameter stove pipe vent in the roof directly above it. The roof covering is corrugated steel sheeting and split cedar shingles. The entire structure is anchored with round-head wire nails. A 6-millimeter heavy gauge steel wire and 1 inch ceramic insulator have been installed above the entry way of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at other structures (Features 5, 18, 27) recorded along the Kilarc canal system. No associated artifact scatter was observed, though small sections of 7-inch diameter stove-pipe were observed strewn about the interior and exterior of the structure.

Feature 11 - Foot Bridge
Feature 11 consists of a modern metal and wood foot bridge/crossing with wood railing.

Feature 12 - Tunnel
Feature 12 consists of a low-ceiling tunnel with a wooden flume running through it. The tunnel opening is approximately 7 feet wide and rises above the water level roughly 3 feet 6 inches. The tunnel has been blasted or bored through solid local bedrock.

Feature 13 - Foot Trail Tunnel Bypass
Feature 13 consists of a tunnel bypass foot trail. This trail is used to navigate over the large bedrock outcrop that Feature 12 goes through. The trail connects the upstream and downstream mouths of the tunneled canal sections. The trail climbs abruptly from the upslope edge of the canal and from the foot bridge Feature 11, proceeding over the crest of the hill and bedrock outcrop then gently contours the slope back to the aqueduct and concrete flume near the downstream mouth of the tunnel (Feature 12).

Feature 14 - Abandoned Flume Alignment
Feature 14 consists of a section of abandoned wood flume alignment. The abandoned alignment consists of a broad contouring 12 foot wide by 7 foot deep cut into the approximately 65 degree slope. A portion of the abandoned alignment displays a large V-cut excavated into the adjacent hillside measuring at least 15 feet deep and 20 feet wide. The abandoned wood flume alignment is heavily overgrown with local vegetation and portions of the alignment have been destroyed by significant erosion and landslide events. A rusted shovel head was found on this old alignment, near the mouth of the tunnel.

Feature 15 - Foot Bridge
Feature 15 consists of a modern metal foot bridge/crossing.

Feature 16 - Drains
Feature 16 consists of a large number of metal and concrete constructed drains. These drains occur at irregular intervals along the entire length of the Kilarc canal system. These drains consist of a 1-foot diameter culvert and associated concrete channel. These structures are designed to drain the water trapped from the upslope side of the concrete flumes. A 1-foot diameter culvert is positioned vertically then travels under the flume to pour into concrete channels down slope.

Feature 17 - Metal Flume
Feature 17 consists of a section of modern wood and metal flume.

Feature 18 - Cabin
Feature 18 consists of a small wooden ditch tender cabin. Formerly known as Kilarc Shack 3, this feature is located approximately 25 feet south and upslope of the main Kilarc aqueduct. The structure measures 12 feet (NE-SW) by 10 feet (NW-SE), and 12 feet high to the peak of the gabled roof. The structure has a square plan and gabled profile. The structure is wood framed with a single north-east facing window opening. The window opening measures 24 inches wide by 18 inches tall. There is an open doorway on the southeast façade that measures 2 feet wide by 6 feet 6 inches high. The walls, roof and floors are made from milled 1 by 10 inch fir boards. The exterior walls are covered with vertically mounted split cedar shingles. The interior walls are covered with particle board. The roof covering is split cedar shingles and corrugated steel sheeting. Most of the floor and foundation have rotted away. A framed 2 foot by 2 foot wood stove footing is present on the floor, offset from the center of the structure with a 7-inch diameter stove pipe vent in the roof directly above it. The entire structure is anchored with round-head wire nails. A 6-millimeter heavy gauge steel wire and 1-inch ceramic insulator has been installed above the entry way of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at other structures (Features 5, 10, 27) recorded along the Kilarc canal system. No associated artifact scatter was observed, though small sections of 7-inch diameter stove-pipe were observed strewn about the interior and exterior of the structure.

Feature 19 - Wood and Metal Flume
Feature 19 consists of a section of modern wood and metal flume.

Feature 20 - Wood and Metal Flume
Feature 20 consists of a section of modern wood and metal flume.

Feature 21 - Wood and Metal Flume
Feature 21 consists of a section of modern wood and metal flume.

Feature 22 - Spillway and Gate
Feature 22 consists of an emergency spillway and associated gate valve. The system is also designed to let excess water drain out of the canal system in the event of possible overflow.

Feature 23 - Wood and Metal Flume
Feature 23 consists of a section of modern wood and metal flume.

Feature 24 - Wood and Metal Flume
Feature 24 consists of a section of modern wood and metal flume.

Feature 25 - Wood and Metal Flume
Feature 25 consists of a section of modern wood and metal flume.

Feature 26 - Foot Bridge
Feature 26 consists of a modern metal foot bridge/crossing.

Feature 27 - Cabin
Feature 27 consists of a small wooden ditch tender cabin. This feature was not previously recorded. The structure is located approximately 20 feet west of the main Kilarc aqueduct. This cabin is the first structure to be located on the right bank of the canal. The structure measures 10 feet 6 inches (E-S) by 12 feet (N-S), and 12 feet 6 inches high to the peak of the gabled roof. The walls themselves are 7 feet high. The structure has a

square plan and gabled profile. It is wood framed with a single southeast facing window opening measuring 24 inches wide by 18 inches tall. The window is designed to slide inside the wall of the structure (cross-pattern sash with 6 panes that are no longer intact, mortises and wood peg construction).

There is an open doorway on the southeast façade that measures 2 feet 6 inches wide by 6 feet 6 inches high. The walls, roof and floors are made from milled 1 by 10 inch fir boards. The exterior walls are covered with vertically mounted split cedar shingles. Modern carved graffiti was observed on exterior. The interior walls are covered with particle board. The roof covering is split cedar shingles and corrugated steel sheeting. Most of the floor and foundation have rotted away. A framed 2 foot by 2 foot wood stove platform is present on the floor, offset from the center of the structure with a 7 inch diameter stove pipe vent in the roof directly above it. The entire structure is anchored with round-head wire nails. The cabin has a generally west-facing back porch, an attribute not observed on the other recorded cabins along the canal.

The porch is constructed of milled 2 x 4 and 4 x 4 inch planks and measures approximately 3 feet wide by 14 feet long and stands about 4 above the ground surface. The porch forms an L-shape, beginning at the front entryway, wrapping around the west façade. The support posts for the porch are mounted on roughly 1 by 1 foot stone footings. The floor of the porch is littered with firewood, lumber scraps, at least 2 lead-solder hole-n-top sanitary cans and 1 folded side-seam coffee tin. The cabin is associated with a historic period refuse deposit located adjacent to and on the west-facing down slope of the cabin.

The historic-era artifacts observed include but may not be limited to; "Prince Albert" style tobacco tins, folded side-seam sanitary cans and coffee tins, brick fragments and heavy gauge fencing wire bundles. A 6-millimeter heavy gauge steel wire and 1 inch ceramic insulator have been installed above the entry way of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at other structures (Features 5, 10, 18) recorded along the Kilarc canal system.

Feature 28 - Metal Flume
Feature 28 consists of a section of modern metal flume.

Feature 29 - Cross Flume
Feature 29 consists of a cross flume constructed of wood with concrete footing, possibly of historic-era construction. The cross-flume is constructed of milled 2-by-4 inch lumber and measures 2 feet 6 inches wide by 1 foot high (or deep). The upright side walls are 4 inches wide and 2 feet deep.

Feature 30 - Foot Bridge
Feature 30 consists of a modern metal foot bridge.

Feature 31 - Cross Flume
Feature 31 consists of a modern metal cross-flume.

Feature 32 - Metal Flume
Feature 32 consists of a section of modern metal flume that is associated with a series of two short tunnels. The tunnels are cut through solid volcanic tufa stone. The tunnels are likely the historic-era feature; the flume itself is made of modern steel construction and materials.

Feature 33 - Foot Bridge
Feature 33 consists of a wooden foot bridge/crossing.

Feature 34 - Spillway and Gate
Feature 34 consists of an emergency spillway and associated gate valve. The system is also designed to let excess water drain out of the canal system in the event of possible overflow. This feature is located on the main Kilarc flume approximately 4000 feet east of the Kilarc Forebay. The structure measures roughly 10 feet wide with 2-foot sidewalls where it connects with the flume. The outlet width narrows to approximately 4 feet at the tapered northern end, with a corresponding decrease in the height of the sidewalls. The outlet is controlled by a hand-operated crank lever that raises or lowers a tongue-and-groove fixed wood plank that serves as a water gate.

Feature 35 - Spillway
Feature 35 consists of an emergency spillway, associated gate valve and metal foot bridge/crossing. The spillway system is also designed to let excess water drain out of the canal system in the event of possible overflow.

Feature 36 - Foot Bridge
Feature 36 consists of a modern metal and wood foot bridge/crossing with concrete footings.

Feature 37 - Trash Collector
Feature 37 consists of a modern metal trash collector mechanism or apparatus.

Feature 38 - Foot Bridge
Feature 38 consists of a modern metal and wood foot bridge/crossing with concrete footings.

Feature 39 - Foot Bridge
Feature 39 consists of a modern metal and wood foot bridge/crossing with concrete footings.

Feature 40 - Forebay Spillway
Feature 40 consists of the main Kilarc forebay spillway. This feature is designed to evacuate the overflow of the Kilarc forebay.

Feature 41 - Forebay
Feature 41 consists of the Kilarc Forebay, a 4-acre reservoir that collects water before entering the penstock en route to the Kilarc Powerhouse.

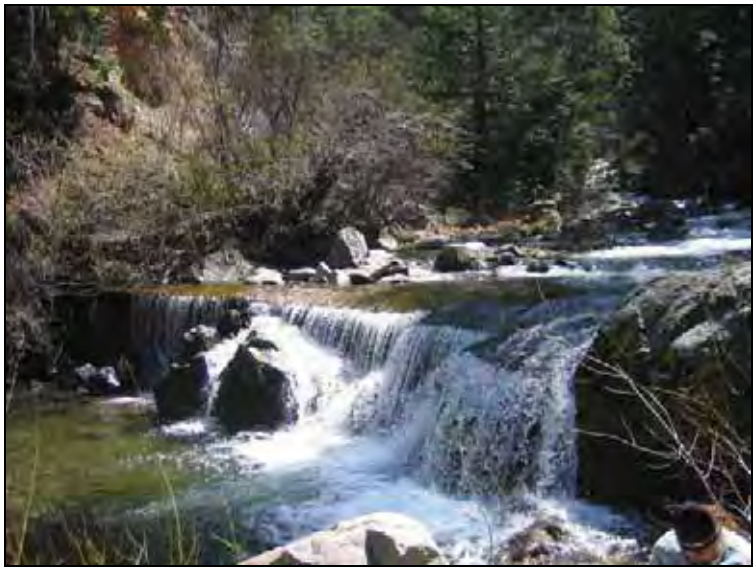
Feature 42 - Intake
Feature 42 consists of a modern metal pier and associated water intake. From this location water enters the large historic-era riveted steel penstock intake on its way to the Kilarc Powerhouse down slope.

Feature 43 - Penstock
Feature 43 consists of an historic-era riveted steel penstock and attached (modern/bolted) upright welded penstock vent or surge tower. It is a large rivet, large diameter steel penstock pipe, riveted in 8-foot sections with 1-inch rivets. The Kilarc Penstock is a 4,801-foot long partially buried pipe. It is made of riveted steel with a diameter that varies from 48 inches to 36 inches and a plate thickness varying from 0.19 to 0.25 inches. The maximum flow capacity is 43 cfs.

Feature 44 - Rock Wall in the Kilarc Forebay Dam
Feature 44 consists of a segment of dry-stacked rock retaining wall. This feature is located slightly below the southern edge of the forebay dam. It consists of at least six courses of dry stacked local field stone; it measures 3 to 4 feet in height and is approximately 82 feet long.

Feature 1:
This feature is the Main Water Diversion into the Kilarc Canal from Old Cow Creek. The spillway is a 10 feet high and 20 foot wide concrete wall perpendicular to Old Cow Creek that artificially raises the streambed water level. The top of the wall is 2 feet thick. The diversionary structure and dam is a V-shaped concrete structure which serves to divert and control the flow of water from the natural stream bed of Old Cow Creek to the opening of the main flume and aqueduct for the Kilarc water system. The concrete diversion structure is located on the southwestern side of the spillway that acts to force water into the head of the canal system. In this location the water is channeled into an artificial creek bed approximately 12 feet wide, flowing in a torrent towards a secondary spillway and gate valve (Feature 2) and intake into the concrete flume (Feature 3). The mouth of the diversionary structure is a water gate that is actuated by a crank and chain driven flap. The diversion structure measures 6 feet wide by 10 feet tall. From this point, the diverted water flows approximately 3.65 miles through a system of canals, flumes and penstock to the Kilarc forebay and recreation area.

Feature 1: Kilarc Main Diversion, Gate and Gate Operator. Facing: Southeast
(Photo acc. # 482-12-1-30)



Feature 1: Kilarc Diversion Dam. Facing: Northeast
(Photo acc. # 482-12-1-31)

Feature 2:
Spillway and dam associated with the Main Water diversion located a short distance downstream of the main water diversion (Feature 1). The spillway consists of a concrete dam about 12 feet long by 18 inches wide by approximately 6 feet high with 8 inch thick walls and associated retaining wall (upstream on right bank) measuring roughly 15 feet long by 18 inches wide. Incorporated into the spillway is a 6 by 3 foot concrete cistern or water basin. The mouth of the diversionary structure is a water gate that is actuated by a crank and chain driven flap. This is the location of the intake into the first concrete flume on the Kilarc canal.

Feature 2: Diversion Dam. Facing: Northeast
(Photo acc. # 482-12-1-39)

Feature 3:
This feature is the concrete flume that is present in intervals along sections of the Kilarc canal system en route to the Kilarc forebay. The concrete flume sections are a squared-off U-shape in cross-section and are generally 4 to 6 feet wide, 3 feet deep with 3 to 6 inch thick walls and occur in varying lengths along the course of the canal.

Feature 3: Concrete Canal. Facing: West
(Photo acc. # 482-12-2-52)

Feature 4:
The feature is a modern wood and corrugated aluminum gabled frame gauging station shack. The structure measures 6 feet (N-S) by 4 feet (E-W) and is 11 feet tall.

Feature 4: Gauging Station structure. Facing: Southwest
(Photo acc. # 482-12-1-42)

Feature 5:
This feature is a small wooden ditch tender cabin. Formerly known as Kilarc Shack 2, this feature is located approximately 25 feet south and upslope of the main Kilarc aqueduct. The structure measures 10 feet (E-W) by 12 feet (N-S), has a square plan and a gabled profile. The structure is wood framed with a single window on the west and north sides (cross-pattern sash with 6 panes that are no longer intact) that measure 24 inches wide by 18 inches tall. There is an open doorway on the west face that measures 2 feet wide by 6 feet 6 inches high. The walls, roof and floors are made from 1 by 10 inch fir boards. The roof and exterior walls are covered with vertically mounted split cedar shingles. The interior walls are covered with particleboard. The roof covering is corrugated steel sheeting. Most of the floor and foundation have rotted away. A framed 2-foot by 2 foot wood stove footing is present on the floor, offset from the center of the structure with a 7-inch diameter stovepipe vent in the roof directly above it. The entire structure is anchored with round-head wire nails. A 6-millimeter heavy gauge steel wire and 1-inch ceramic insulator have been installed above the entryway of the structure to provide electricity or possibly telegraph communications. This wire has been connected to adjacent trees and has been observed at all structures (Features 5, 10, 18, 27) recorded along the Kilarc canal system. No associated artifact scatter was observed, though small sections of 7-inch diameter stovepipe were observed strewn about the interior and exterior of the structure.

Feature 5: "Kilarc Shack 2" Ditch Tender Cabin. Facing: Northeast
(Photo acc. # 482-12-1-60)

Subject: P-606 AIR Item 9-Cultural Resources
From: "Kelly W. Sackheim" <kelly@kchydro.com>
Date: Wed, 25 Nov 2009 08:50:59 -0800
To: "Whitman, Lisa" <LxWt@pge.com>
CC: Richard Ely <dick@davishydro.com>

Lisa - per our telephone conversation the other day, attached is information that Dick provided for me to review and forward to you. Don't hesitate to call if you have any further questions, and have a great holiday.

Kelly
ph: 916/962-2271
fax: 916/880-5597

Whitman, Lisa wrote:

> Thank you, Kelly.
>
> Lisa Whitman
> Pacific Gas & Electric Company Mail Code N11D
> P.O. Box 770000
> San Francisco, CA 94177-0001
> Phone: 415.973.7465/Fax: 415.973.5121/Cell: 415.265.9971
> lxwt@pge.com

AIRinfo9CulturalResources.doc	**Content-Type:** application/msword **Content-Encoding:** base64

Ref: FERC Additional Information Request of PG&E – Accession #20091116-0148

Cultural Resources

9. **Comments filed in response to scoping indicate that the upper portion of the Kilarc canal may have originally been constructed as a hydraulic mining source. While the *Cultural Resources Inventory and Evaluation for the Kilarc-Cow Creek Hydroelectric Decommissioning Project, FERC No. 606, Shasta County, California*, addresses the existence of hydraulic mining water sources in the area prior to construction of the Kilarc facility, it does not specifically address the use of any portion of the Kilarc canal as a mining water source. Also, the Kilarc canal system, with the exception of the powerhouse, has been determined not eligible for listing on the National Register of Historic Places (NRHP) due to the lack of physical historic integrity of the resource. Has use of the canal for mining been specifically explored? If so, was this information part of the analysis and evaluation of the resource for listing on the NRHP?**

The referenced filed comments were made by Davis Hydro (DH) staff.

In the opinion of DH, the upstream section of the Kilarc headrace from the diversion down to the cornice a half mile downstream on the far side of the tunnel in particular may have been used as water for hydraulic face mining on the slope in the area on the downstream side of the tunnel. There are signs of hydraulic mining there.

We do not have good pictures of these faces as the focus of our pictures have been on the spawning gravel and juvenile fish habitats. However, see Photo 100_7542_exposure.JPG, below, for a poor view of one of the areas to which we are referring.

(smaller file-size version inserted at left, all pictures available for download upon request to kelly@davishydro.com)

Photo was taken on 07-DEC-08, 9:48:34AM at
N40 41 02.8. W121 49 02.6
at an elevation of 2679 ft.

Features are visible from parts of the Roseburg property.

A second observation is made of extensive, very old piping found in the area that may have either of two explanations:

1. It is the remains of an earlier siphon predating the current one, OR

2. This was part of low pressure hydraulic mining works. See pictures below. These were taken on 07-DEC-08 9:53:00AM at N40 41 01.5 W121 49 04.4 at an elevation of 2662 ft.





The third reference is that Richard Ely and Todd Wroe found residual structures that look exactly like a gold settlement sluice way next to the stream bed. However, we regret for unknown reasons, no notes connect that recollection to any photographs or GIS points.

Finally, there are extensive canaling and unnatural similar erosion on the North side of the Old Cow. For example in the area just west of the "impassable Falls" there are easily seen canal works and extensive un-natural erosion downstream that suggests hydraulic mining. These are not connected in any way to the upstream works possibly fed from the first part of the Kilarc Diversion.

Document Content(s)

KC LLC
5096 Cocoa Palm Way
Fair Oaks, CA 95628

November 21, 2011

Kimberly D. Bose, Secretary
(Attn: CarLisa Linton-Peters, FERC Environmental Coordinator)
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Filed Electronically

Ref: P-606 Kilarc-Cow Creek Hydroelectric Project

Subject: Request that FERC Conclude Appropriate Section 106 Review before Issuing Order Accepting P-606 License Surrender

Dear Ms. Bose:

We have been active participants in the P-606 license surrender process from before the first license surrender kick-off meeting was held in early 2007. The Shasta Historical Society supported the preparation of the Cultural Resources Report found in Pacific Gas and Electric Company's (PG&E's) Draft License Surrender Application by sharing records and answering questions of the document preparers.

By letter dated March 26, 2010 addressed to the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO)[1] assigned FERC Accession No. 20100329-5037, we stated that "We DISPUTE the concurrence[2] with the PG&E recommendation for a finding of noneligibility based on the shoddy documentation and biased analysis found in the document preceding the November 2008 determination."

We were heartened to learn recently, as documented in the enclosure to this letter, that there is a precedent for the ACHP to intervene, and even lead to the reversal of a FERC Order to irreversibly modify an historic facility, so that an historic hydroelectric facility could be restored to operation. We believe that timely action in collaboration with the

[1] Downloadable directly from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13803516
[2] Letter from the SHPO to PG&E dated November 4, 2008 with reply reference of FERC0508022A/FERC080922A, a copy of which may be found under FERC Accession No. 20090420-5109 downloadable directly from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13708956

ACHP, before FERC makes a final determination on the dismantling of the P-606 project as proposed by PG&E, would yield a similarly beneficial result.

Sincerely,

Kelly W. Sackheim, Principal
KC LLC

Sandra L. Winters, Volunteer
Shasta Historical Society

Enclosure

Cc by e-mail to the ACHP: Charlene Dwin Vaughn, assistant director; Kelly Fanizzo, NRCS program analyst/attorney advisor; and Lee A. Webb, Department of Energy liaison of ACHP, and Cheryl Foster-Curley for the SHPO

5096 Cocoa Palm Way
Fair Oaks, CA 95628
KC LLC
kcllc@kchydro.com
ph: 301/401-5978
fax: 916/880-5597

CERTIFICATE OF SERVICE

I hereby certify that I have on this day served the foregoing document by email upon each person designated on the official service list compiled by the Secretary of the Commission in these proceedings for receipt in this manner.

Dated at Fair Oaks, CA this 21st day of November 2011.

Kelly W. Sackheim

Kelly W. Sackheim
5096 Cocoa Palm Way
Fair Oaks, CA 95628

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New York: Treatment of the Mechanicville Hydroelectric Plant

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New York: Treatment of the Mechanicville Hydroelectric Plant

***Agency:* Federal Energy Regulatory Commission**

The fate of the Mechanicville Hydroelectric Plant, possibly the only remaining pre-1900 facility with its original equipment intact, is currently being negotiated. In this case, a Federal agency accepted the license surrender from the current owner of this National-Register property prior to concluding Section 106 review—a possible foreclosure because the agency had determined that the proposed surrender would constitute an adverse effect. ACHP took the unprecedented step of filing a motion to intervene in this proceeding.

The Mechanicville Hydroelectric Plant includes a powerhouse, an earth embankment, a concrete non-overflow dam, and a 700-feet-long concrete gravity overflow dam. The plant was listed in the National Register of Historic Places in 1989 for its demonstration of exemplary significance in the fields of industry, architecture, and engineering. It is important in the development of hydroelectric generation because it may be the only remaining pre-1900 facility with its original equipment intact and was the longest continuously operating hydroelectric project in New York until operation ended in 1997.

The joint licensees for the property, Niagara Mohawk Power Corporation, which owns the plant, and Fourth Branch Associates, proposed to surrender their license to the Federal Energy Regulatory Commission (FERC). Niagara Mohawk met with State agencies, including the New York State Historic Preservation Officer (SHPO), regarding disposition and treatment of the historic property, but neither ACHP nor FERC attended the meetings.

In 2000, ACHP took the unprecedented step of filing a motion to intervene in the FERC proceeding. As an intervener, ACHP was ensured of receiving all project documentation during the proceeding, and could, if necessary, file for a rehearing.

In 2001, at FERC's behest, Niagara Mohawk submitted a plan for the short and long term treatment of the project. ACHP, the SHPO, and Fourth Branch Associates provided comments on the plan. Fourth Branch Associates submitted a competing treatment plan for the project. That same year, FERC issued a Draft Environmental Assessment (EA) for review and comment. The draft EA included FERC's finding that surrender of the license would be an adverse effect. The SHPO, ACHP, Niagara Mohawk and FBAM provided comments.

In February 2002, FERC issued an Order Accepting License Surrender for the Mechanicville Project. In the final EA, which was attached to the order, FERC found that surrender of the license would be an adverse

effect. One of the conditions stipulated that Niagara Mohawk must, within 90 days of the order, prepare and file for FERC approval a plan and schedule to document the Mechanicville Project's historic resources per Federal standards. Niagara Mohawk was to prepare the plan after consultation with the SHPO and ACHP.

In April 2002, Niagara Mohawk began consulting with the SHPO regarding the scope and content of the documentation effort in order to comply with FERC's order. ACHP and Fourth Branch Associates filed for rehearing on the basis that Section 106 review has not been appropriately concluded. ACHP declined to participate formally in consultation with Niagara Mohawk because of FERC's failure to correctly conclude Section 106 review.

The company plans to complete these responsibilities by December 2002. That next month, FERC issued an Order Granting Rehearing for Further Consideration for the Mechanicville project. FERC expects to issue an order on the merits of this proceeding soon.

In the meantime, Niagara Mohawk stated that according to the structural analysis that was recently completed for the project, safety is a real concern. A hard winter and the attendant ice could cause the hydroelectric plant's dam to fail. To address this issue, Niagara Mohawk will fill the forebay and tailrace water passages with concrete to maintain and improve the structural stability of the powerhouse.

According to the company, it appears that the New York Canal Corporation will take ownership of the dam. The dam and powerhouse share walls, but the State agency does not want ownership of the powerhouse itself. A local developer is interested in using the former powerhouse as a restaurant and brew pub, and Niagara Mohawk says it is hopeful that information and displays about this historic property can be incorporated into the design.

Staff contact: Laura Henley Dean

Posted June 6, 2002

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New York: Transfer of Ownership of the Mechanicville Hydroelectric Plant

***Agency:* Federal Energy Regulatory Commission**

As reported in the Spring 2002 *Case Digest,* the Federal Energy Regulatory Commission accepted the surrendered license for a private historic hydroelectric plant before an agreement could be reached on the treatment of the National Register-listed property.

FERC's actions before concluding the Section 106 review process has created significant procedural problems that must be addressed before the plant can be transferred to New York State.

In accordance with FERC's regulations, in April 2002 ACHP requested a rehearing of the case because it did not have evidence that FERC executed an agreement as required by Section 106 of the National Historic Preservation Act. At that time ACHP also requested that FERC consider specific issues regarding mitigation and the involvement of consulting parties and the public, and advise ACHP about how FERC planned to proceed.

Mechanicville Hydroelectric Plant, New York (photo courtesy of Fourth Branch Associates and NY State Office of Parks, Recreation, and Historic Preservation)

In August 2002, FERC denied ACHP's request for a rehearing, asserting that FERC substantially complied with Section 106 review because it had required the plant owner to document the historic property and to use reversible techniques to decommission the plant.

FERC also stated that it terminated consultation through its November 2001 notice requesting review and comments on a Draft Environmental Assessment of the project, even though the notice did not explicitly state that consultation was being terminated. FERC's failure to follow the procedures that are set forth in ACHP's regulations could result in a challenge by parties with an interest in the project.

ACHP is currently evaluating the situation and possible steps to be taken with FERC. For background information on this case, see the Spring 2002 *Case Digest* at www.achp.gov/casesspg02NY2.html.

Staff contact: Laura Henley Dean

Posted November 7, 2002

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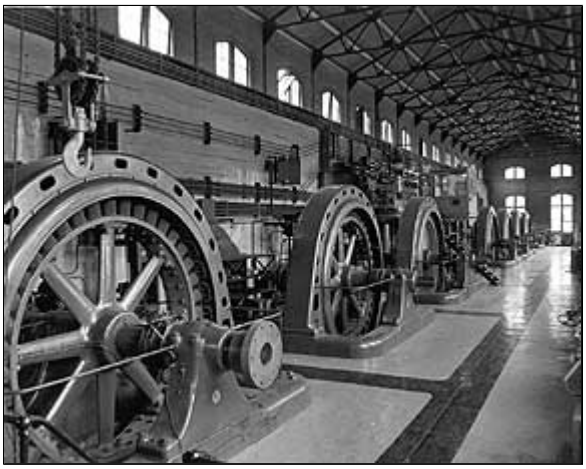
New York: Transfer of Ownership of the Mechanicville Hydroelectric Plant

Agency: Federal Energy Regulatory Commission

As reported in the Spring and Fall 2002 *Case Digests,* the Federal Energy Regulatory Commission accepted the surrendered license for a private historic hydroelectric plant before an agreement could be reached on the treatment of the property.

The plant, listed in the National Register for exemplary significance in the fields of industry, architecture, and engineering, may be the only remaining pre-1900 facility with its original equipment intact. Its fate is still being considered.

In fall 2002, after the Federal Energy Regulatory Commission (FERC) denied the ACHP's request for a rehearing of FERC's order accepting the surrendered license for the National Register-listed Mechanicville Hydroelectric Plant, the ACHP filed a request that FERC reconsider the denial.



Mechanicville Hydroelectric Plant, Mechanicville, NY (photo courtesy of Fourth Branch Associates and New York State Office of Parks, Recreation, and Historic Preservation)

In December 2002, FERC held a technical conference to consider alternatives to filling the hydroelectric plant's forebay and tailrace water passages with concrete to maintain and improve the structural stability of the powerhouse.

In February 2003, FERC submitted an agreement to the ACHP and the New York State Historic Preservation Officer that called for recordation of the historic property. Both agencies declined to sign the agreement, and in March 2003, FERC denied the ACHP's request for reconsideration and terminated consultation.

However, through arbitration, the co-licensees for the hydroelectric plant reached a settlement regarding the fate of the project. In the settlement, the licensee that owns the historic property would give the

plant and financial support to the other licensee, which would rehabilitate the plant and resume operation.

This development is very encouraging, but FERC must first accept the terms of the settlement. Careful consideration of the proposed rehabilitation and reuse of the hydroelectric plant will begin in April 2003 with a presentation to FERC and the other consulting parties by the licensee or co-licensees. For background information on this case, see the spring and fall 2002 *Case Digests* at www.achp.gov/casearchive/.

Staff contact: Laura Henley Dean

Posted August 15, 2003

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New York: Transfer of Ownership of the Mechanicville Hydroelectric Project

***Agency:* Federal Energy Regulatory Commission**

As reported in previous *Case Digests,* the Federal Energy Regulatory Commission accepted surrender of the license for a privately owned historic hydroelectric project before a proper agreement could be reached on the treatment of the property.

The project, including a powerhouse, is listed in the National Register for exemplary significance in the fields of industry, architecture, and engineering. The ACHP requested that FERC reconsider or stay its acceptance of the license surrender so that consultation to resolve adverse effects could resume.

The first step toward a resolution was reached when the co-licensees, who had been in dispute since the license was issued, reached a settlement in April 2003.

In May 2003, the ACHP chairman made a direct written appeal to the chairman of the Federal Energy Regulatory Commission (FERC), urging that FERC approve the licensees' settlement agreement and withdraw its termination.

Preparations begin for rehabilitation of the Mechanicville Hydroelectric Project, Mechanicville, NY (photo Fourth Branch Associates)

The following month, FERC approved an offer of settlement that would transfer the Mechanicville hydroelectric project from its owner to the project's co-licensee. If the licensee can meet certain conditions such as establishing an escrow account that will cover the cost of safety repairs, then the Mechanicville hydroelectric project will be rehabilitated and resume operation.

FERC and the ACHP agreed that transfer of the project license would not alter the finding of effect when the license was first issued. FERC, however, determined that its approval of rehabilitation and remediation plans is a separate undertaking also requiring Section 106 review.

Accordingly, the ACHP, FERC, and the New York State Historic

Preservation Officer concluded Section 106 review by executing a Memorandum of Agreement in August 2003. For background information on the Mechanicville hydroelectric project case, see the *Case Digest* archive at www.achp.gov/casedigest.html.

Staff contact: Laura Henley Dean

Updated November 20, 2003

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Document Content(s)

KC LLC
5096 Cocoa Palm Way
Fair Oaks, CA 95628

November 21, 2011

Kimberly D. Bose, Secretary
(Attn: CarLisa Linton-Peters, FERC Environmental Coordinator)
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Filed Electronically

Ref: P-606 Kilarc-Cow Creek Hydroelectric Project

Subject: Request that FERC Conclude Appropriate Section 106 Review before Issuing Order Accepting P-606 License Surrender

Dear Ms. Bose:

We have been active participants in the P-606 license surrender process from before the first license surrender kick-off meeting was held in early 2007. The Shasta Historical Society supported the preparation of the Cultural Resources Report found in Pacific Gas and Electric Company's (PG&E's) Draft License Surrender Application by sharing records and answering questions of the document preparers.

By letter dated March 26, 2010 addressed to the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO)[1] assigned FERC Accession No. 20100329-5037, we stated that "We DISPUTE the concurrence[2] with the PG&E recommendation for a finding of noneligibility based on the shoddy documentation and biased analysis found in the document preceding the November 2008 determination."

We were heartened to learn recently, as documented in the enclosure to this letter, that there is a precedent for the ACHP to intervene, and even lead to the reversal of a FERC Order to irreversibly modify an historic facility, so that an historic hydroelectric facility could be restored to operation. We believe that timely action in collaboration with the

[1] Downloadable directly from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13803516
[2] Letter from the SHPO to PG&E dated November 4, 2008 with reply reference of FERC0508022A/FERC080922A, a copy of which may be found under FERC Accession No. 20090420-5109 downloadable directly from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13708956

ACHP, before FERC makes a final determination on the dismantling of the P-606 project as proposed by PG&E, would yield a similarly beneficial result.

Sincerely,

Kelly W. Sackheim, Principal
KC LLC

Sandra L. Winters, Volunteer
Shasta Historical Society

Enclosure

Cc by e-mail to the ACHP: Charlene Dwin Vaughn, assistant director; Kelly Fanizzo, NRCS program analyst/attorney advisor; and Lee A. Webb, Department of Energy liaison of ACHP, and Cheryl Foster-Curley for the SHPO

5096 Cocoa Palm Way
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KC LLC
kcllc@kchydro.com
ph: 301/401-5978
fax: 916/880-5597

Parks, Jeff@Waterboards

Subject: FW: Comments re: Anadromous Fishery/Habitat Upstream of Whitmore Falls for FERC P-606 (Kilarc) Water Quality Certification

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 12, 2013 6:07 PM
To: Parks, Jeff@Waterboards [private]
Cc: [private]
Subject: Comments re: Anadromous Fishery/Habitat Upstream of Whitmore Falls for FERC P-606 (Kilarc) Water Quality Certification

Jeff - Thanks for getting the documents submitted at the scoping meeting up so quickly. The last sentence about additional comments being posted soon needs to be revised to reflect April 10, 2013 is NOT the Scoping Comment Deadline - but I totally understand things are a little rough as they move quickly.

Before I get to the meat of the subject, I've gotten additional feedback from one of the cc's to my prior e-mail:
On 4/12/2013 3:50 PM, Tom wrote Re: Comment of Todd Wroe and Tom Kamp re: Groundwater for FERC P-606 (Kilarc) Water Quality Certification:

> Kelly,
>
> Just to inform you my spring and water supply was permitted and signed off my the county a few years ago.
>
> Thanks,
>
> Tom Kamp

Now, the subject Comments re: Anadromous Fishery/Habitat Upstream of Whitmore Falls for FERC P-606 (Kilarc) Water Quality Certification:

Due to the large file sizes, I am not attaching the supporting FERC filings, but you may find filed on FERC eLibrary under P-606 the FERC Accession Nos.
20100817-4007 - Transcript of the August 17, 2010 Public Hearing held in Whitmore, CA re Kilarc-Cow Creek Hydroelectric Project under P-606 -- Bob Carey's comments start on line 13 of the 49th page of the FERC-generated .pdf
20091116-0236 - comment submitted by Biologist Robert Carey of Vestra Resources, research article on "Impact of environmental factors on fish distribution assessed in rangeland streams"

Of note: On page 50 of the transcript, Bob Carey stated,
"Prior to 2002 all the resource agencies
4 involved had considered Whitmore Falls an impassable
5 barrier. I want to stress that the DEIS should really
6 be using the best available science in making their
7 determinations. And the 2002 memo that came out
8 really doesn't do that very well."

In other words, the resource agencies allege that more habitat in the Kilarc by-pass reach is necessary to accommodate steelhead that have never been observed upstream of Whitmore Falls, but MIGHT be able to arrive based on a 2002 memo. However, the 2002 memo doesn't provide a good argument for revising the assumption that Whitmore Falls is an impassable barrier.

I have heard Mike Berry of California Fish & Wildlife (formerly CDFG) present in several of the FERC public hearings a metaphor that similarly poorly represents a possible justification for asserting that more habitat in the Kilarc by-pass reach is necessary. Mike Berry has spoken of the Kilarc project area, including the by-pass reach, being like a mansion where the resident fish are limited by the project diversion to occupying only the bathroom. In fact, the Kilarc project area may more properly be characterized like a 10-storey apartment building, with 15 residential units per floor, where only the bottom floor (say, between the FERN Road overcrossing of the natural channel and the powerhouse discharge of up to 50 cfs) have been outfitted with utilities, and thus the other 9 floors are not habitable. In this apartment building, fewer than half of the available ground-floor units are actually occupied, because there are no fish traveling up over Whitmore Falls to take up residency.

Now, using the same analogy, it is possible to ask - would augmenting the minimum instream flows from the current 2-3 cfs to, say, 30 cfs that are required of the Olsen hydroelectric project that is located between the project area and Whitmore Falls, result in the 10-storey apartment building being habitable in the upper storeys? It is known that there is an acknowledged impassable barrier about 1/2-way up the by-pass reach -- so, at best, the anadromous fish would need to occupy (have sufficient habitat to accommodate the population) the lower half of the apartment building. Is there any evidence whatsoever in the public record identifying how much habitat would be created in that zone by increasing the flow by up to 50 cfs that is the capacity of the Kilarc Canal? I do not believe there is.

Now, I have also heard that resident trout would also benefit from additional habitat upstream of the impassable barrier, and thereby potentially contribute to the resident (clearly not exclusively "native" and more likely predominantly hatchery-based, after 50 years of planting fish!) and migrating population - but I am similarly unaware of any quantifiable data to support this hypothesis. In the absence of data, would it make any sense to irreversibly remove the Kilarc Canal? I trust the State Water Board to render an unbiased opinion.

Thank you for considering these issues in your scope of analysis.

Kelly
ph (NEW): 916-877-5947

Parks, Jeff@Waterboards

Subject: FW: Whitmore Community & Save Kilarc Committee Comments Relevant to P-606 (Kilarc) Water Quality Certification
Attachments: KCtoWaterBoardCondition1.pdf

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 12, 2013 6:38 PM
To: Parks, Jeff@Waterboards
Cc: [private]
Subject: Re: Whitmore Community & Save Kilarc Committee Comments Relevant to P-606 (Kilarc) Water Quality Certification

Jeff - Attached is "all new" text, expressing that the Water Board may consider attaching the following
Mandatory Condition: Water quality downstream of the Kilarc Development shall be maintained to preserve habitat in support of the recovery of anadromous fish species of concern -
to every alternative that may be considered for authorization by the FERC.

And, I've attempted to provide the supporting rationale and implementation/monitoring information.

If this is a helpful approach for you, we can provide our additional requests and recommendations in a similar framework.

Kelly

KC Pittsfield LLC
Meeting Energy Needs with Renewable Power Development and Conservation

April 12, 2013

Scoping Comment for the California State Water Board Water Quality Certification for the FERC P-606 Kilarc-Cow Creek Hydroelectric Project License Surrender

The April 10, 2013 Scoping Meeting revealed three elements that will be important to the granting of state water quality certification and ultimate implementation of PG&E's license surrender:

1. There must be an adequate foundation of studies and analysis upon which the water quality certification will be based (in contrast to the inadequate studies concluded by the FERC, and the FERC staff's failure to make its recommendations consistent with its own studies for an environmentally superior alternative that would meet PG&E's objectives),

2. Reasonable alternatives must not be excluded (in contrast to the FERC having limited its analysis to alternatives that would be financially infeasible because the FERC allowed PG&E to refuse to entertain the possibility that any other party may obtain a license to continue operating its facilities following license surrender), and

3. The State Water Board intends to issue its draft mandatory conditions of water quality certification at the same time that it issues its EIR.

Consistent with the above three elements, attached hereto is a proposed Mandatory Condition #1, with supporting justification.

Sincerely,

Kelly W. Sackheim

Kelly W. Sackheim

5096 Cocoa Palm Way
Fair Oaks, CA 95628
www.kchydro.com
KC Pittsfield LLC
phone: 916/877-5947
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Proposed Condition #1 for State Water Quality Certification

As a condition of its Water Quality Certification, the California SWQCB shall require that
Mandatory Condition: Water quality downstream of the Kilarc Development shall be maintained to preserve habitat in support of the recovery of anadromous fish species of concern.

Objective/Beneficial Use to be Achieved: There should be no degradation of the known anadromous fish habitat in Old Cow Creek downstream of Whitmore Falls, and the main stem of Cow Creek below that, which is presently limited by elevated water temperatures.

Performance Standard: The temperature of water discharged from the P-606 Project Boundary to Old Cow Creek shall not be permitted to rise above the temperature achieved by

a) Retaining no less than the project-related flows at elevation and under cover of shade as provided by delivery from the Kilarc Diversion via the Kilarc Canal and Forebay, and
b) Further cooling the water before discharge by removing heat with the generation of hydroelectric power at the existing Kilarc Powerhouse.

Adaptive Management Procedure: The FERC may be encouraged to require that studies be performed as a condition of a new license that would be granted to a new hydropower licensee for use of the water resource of the Kilarc Development to determine

a) the actual contribution of the project to reducing water temperature and
b) the characteristics of anadromous fish populations that would benefit,

so that a future evaluation can be made of the trade-offs between

a) operating a hydroelectric facility to achieve this benefit and
b) any other options that may be available to provide a greater contribution to the recovery of anadromous fish species utilizing this same water resource.

Feasible Option for Achieving Standard: Several parties have expressed an interest in applying for a new FERC license to continue to operate the Kilarc hydroelectric facilities. Davis Hydro established the Kilarc Foundation and developed detailed plans to undertake research to support the recovery of anadromous species, including propagation in the Kilarc Canal. KC Pittsfield LLC has proposed to make beneficial use of water flowing through sections of the Kilarc Canal that are not appropriate for fish research and propagation with the installation of open-channel hydroelectric turbines that are still being refined. PG&E may be required to finance the eventual, rather than immediate, removal of structures.

Parks, Jeff@Waterboards

Subject: FW: FERC filings re: Open Channel Turbines Relevant to P-606 (Kilarc) Water Quality Certification
Attachments: KColdCow_PPapp.pdf; 20130418OrderOnRehearing-3008(28312850).doc

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Thursday, April 18, 2013 9:57 AM
To: Parks, Jeff@Waterboards
Cc: [private]
Subject: FERC filings re: Open Channel Turbines Relevant to P-606 (Kilarc) Water Quality Certification

Jeff - The FERC's rejection of the applications for the Kilarc Open Channel Turbines project was based on form rather than substance, so I've already submitted a new application for an Old Cow Creek Open Channel Turbines project. Both are attached.

Needless to say, the construction impacts associated with the dismantling of PG&E's canal, in addition to the construction of new facilities for the proposed open channel turbines would be an unnecessary adverse environmental effect of allowing PG&E and destroy a facility in lieu of allowing future beneficial re-use.

Hence, I would propose the Water Board consider attaching the following:
Mandatory Condition: Impacts of dismantling of PG&E's canal and construction of substitute facilities for reasonably foreseeable future beneficial use of the water resource shall be avoided by allowing facilities to be recommissioned rather than dismantled.

Kelly

p.s. I see that the Water Board website at the link below has not yet been updated with the comments I submitted last week. If you could also have posted your presentation from the hearing there, it may be more accessible for those working over the weekend to prepare comments by your noon Monday deadline.

Initial Statement

In accordance with CFR Title 18 CHAPTER I—Subpart I—Sec. 4.81, before the Federal Energy Regulatory Commission:

Application for Preliminary Permit

(1) KC Pittsfield LLC applies to the Federal Energy Regulatory Commission for a preliminary permit for the proposed

Old Cow Creek Open-Channel Turbines Hydro Project

as described in the attached exhibits. This application is made in order that the applicant may secure and maintain priority of application for a license for the project under Part I of the Federal Power Act while obtaining the data and performing the acts required to determine the feasibility of the project and to support an application for a license or exemption from licensing.

As defined in CFR Title 18 CHAPTER I—Subpart IV – Sec. 4.33, (3), the proposed project would NOT develop, conserve, and utilize, in whole or in part, the same water resources that would be developed, conserved, and utilized by a project for which an initial development application has been filed.

I, Kelly W. Sackheim, subscribe and verify under oath that the information in this original application for preliminary permit is truthful.

(2) The location of the proposed project is:
State or territory: California
County: Shasta
Township or nearby town: Whitmore,
T. 33 N, R. 1 W, S. 25-27, 33 and 34, Mount Diablo Meridian
Stream or other body of water: Old Cow Creek

(3) The exact name, business address, and telephone number of the applicant are:

KC Pittsfield LLC
5096 Cocoa Palm Way
Fair Oaks, CA 95628
Phone: 301-401-5978

The exact name and business address of each person authorized to act as agents for the applicant in this application are:
Kelly Sackheim, 5096 Cocoa Palm Way, Fair Oaks, CA 95628
fax: 603-571-5947
pitts@kchydro.com

(4) KC Pittsfield LLC is a New Hampshire-registered limited liability company and is not claiming preference under section 7(a) of the Federal Power Act.

(5) The proposed term of the requested permit is 36 months.

(6) *If there is any existing dam or other project facility, the applicant must provide the name and address of the owner of the dam and facility. If the dam is federally owned or operated, provide the name of the agency.*

The project is proposed to provide new generation utilizing flows diverted from Old Cow Creek immediately upstream of the existing P-606 diversion, that exceed the flows utilized by that project, including minimum instream requirements. New infrastructure, including a diversion and canal, would be installed parallel to the P-606 project facilities unless and until those facilities are decommissioned without being dismantled.

Many members of the nearby Whitmore, Oak Run, Millville, Palo Cedro and Shingletown communities have expressed great interest in the continued operation of hydroelectric facilities in this area, but there are no local government agencies that may have interests. There are no cities, towns, or similar political subdivisions within a fifteen mile radius of the project.

Federal and State government agencies that may have interests are: None.

Exhibit 1. Description of the Proposed Project

Exhibit 1 must contain a description of the proposed project, specifying and including, to the extent possible, the information identified in the following 6 numbered sections.

(1) *The number, physical composition, dimensions, general configuration and, where applicable, age and condition, of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, that would be part of the project*

The existing approximately 3-mile-long Kilarc Canal has transported water from Old Cow Creek to the Kilarc Forebay since 1903. Several segments of the canal have nature-like conditions while other segments are concrete-sided and/or gunite-lined. Davis Hydro has proposed to establish and operate a Steelhead research facility utilizing primarily the nature-like segments of the canal. The P-14433 and P-14434 Kilarc Open-Channel Turbines preliminary permit applications proposed to introduce open-channel turbines recently piloted by Hydrovolts into those segments of the canal that are not occupied by fish. If necessary, the turbines may be removed easily during certain periods to facilitate fish passage.

The disposition of the Kilarc Canal remains unknown pending the granting of PG&E's P-606 License Surrender. The applicant for this preliminary permit is proposing to divert water that is already surplus to the P-606 project into a new conduit that would run parallel to PG&E's facilities, unless and until PG&E were granted authorization, or perhaps even mandated, to leave portions of these facilities in place for future beneficial use as an environmentally superior alternative to the original proposal to dismantle.

(2) *The estimated number, surface area, storage capacity, and normal maximum surface elevation (mean sea level) of any reservoirs, whether existing or proposed, that would be part of the project*

The new diversion would utilize only water that is surplus to PG&E's existing diversion to a 50 cfs-capacity canal. In the long term, it is anticipated that that the diversion would not exceed the historic diversion by PG&E. The existing canal descends from slightly above to slightly below 3800 feet msl. New canal would be configured to accommodate the minimum turbine specifications of 6-foot depth and 13-foot width. The discharge to Old Cow Creek would most likely be located at existing overflow sites along the PG&E's Kilarc Canal and Forebay.

(3) *The estimated number, length, voltage, interconnections, and, where applicable, age and condition, of any primary transmission lines whether existing or proposed, that would be part of the project [in accordance with 16 U.S.C. 96(11)]*

The distributed-generation scale of each turbine would allow for integration of generation with new distribution lines that will be required for the proposed research facilities.

(4) *The total estimated average annual energy production and installed capacity*

(provide only one energy and capacity value), the hydraulic head for estimating capacity and energy output, and the estimated number, rated capacity, and, where applicable, the age and condition, of any turbines and generators, whether existing or proposed, that would be part of the project works

Up to 5 new Hydrovolts C-2 (medium) canal open-channel turbines with an average generating capacity of 2 kW may be installed initially in 3 distinct segments of the canal. The velocity (substitute for hydraulic head for estimating capacity and energy output) of the 50 cfs (average flow delivered to Kilarc forebay for subsequent utilization by the P-606 turbines) at each turbine site is anticipated to range from 0.6 to 0.8 feet-per-second.

(5) *All lands of the United States that are enclosed within the proposed project boundary described under paragraph (e)(3) of this section, identified and tabulated on a separate sheet by legal subdivisions of a public land survey of the affected area, if available. If the project boundary includes lands of the United States, such lands must be identified on a completed land description form, provided by the Commission. The project location must identify any Federal reservation, Federal tracts, and townships of the public land surveys (or official protractions thereof if unsurveyed). A copy of the form must also be sent to the Bureau of Land Management state office where the project is located.*

No lands of the United States are enclosed within the proposed project boundary.

(6) *Any other information demonstrating in what manner the proposed project would develop, conserve, and utilize in the public interest the water resources of the region*

This project will contribute to the development and refinement of open-channel hydroelectric generating technologies and serve to provide economical, green, renewable energy that will be used in the local area. Cooling associated with maintenance of flows at elevation and hydroelectric generation would benefit downstream habitat used by endangered anadromous fish that is constrained by elevated temperatures.

Exhibit 2. Studies

Exhibit 2 is a description of studies conducted or to be conducted with respect to the proposed project, including field studies and estimated costs.

(1) *General Requirement (Feasibility Studies and any new roads built to conduct studies)*

Given the absence presently of proximate electric interconnection opportunities and the very small scale of generation, the project feasibility will be dependent on either the concurrent development of the proposed Steelhead research facility that would share infrastructure costs and benefit from the electricity generated or potential underwriting by Hydrovolts or other parties that may benefit from having a demonstration/pilot project in northern California to further promote refinement and expansion of the use of open-channel turbine technologies.

(2) *Work Plan for New Dam Construction including (i) description of disturbance that may be caused by studies; and (ii) a completion schedule within the permit timeframe; where the studies would require foundation exploration in the field.*

No new dam construction is proposed.

(3) *Waiver to requirements of (2) immediately above may be granted by the Commission upon a showing by the applicant that activities to be conducted under the permit would not adversely affect cultural resources or endangered species and alterations would be minor and restored.*

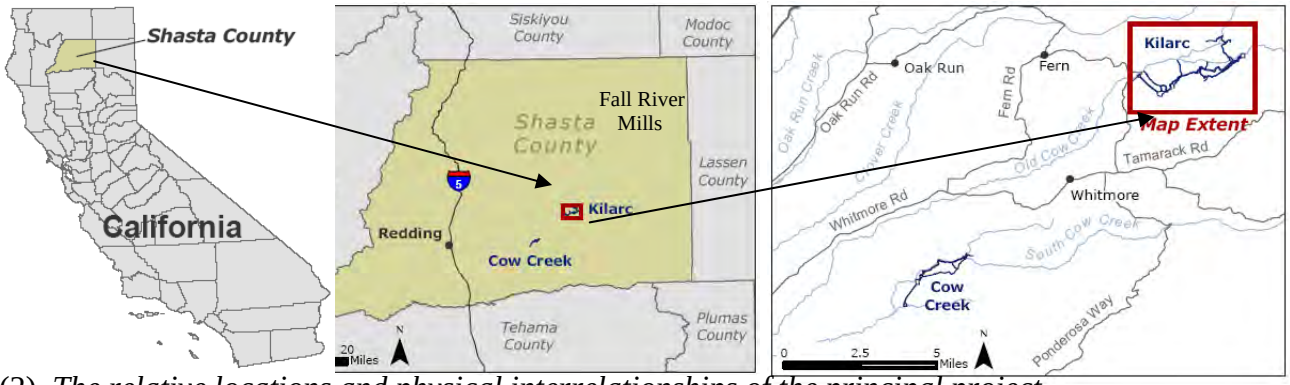
No construction activities are proposed under the permit.

(4) *Statement of Costs associated with Studies described in this Exhibit 2 and sources and extent of financing available.*

Study requirements are minimal based on Kelly Sackheim's involvement in the P-606 license surrender process for over six years, and the extensive documentation associated with the P-606 license surrender process and Steelhead research facility proposal.

Exhibit 3. Maps

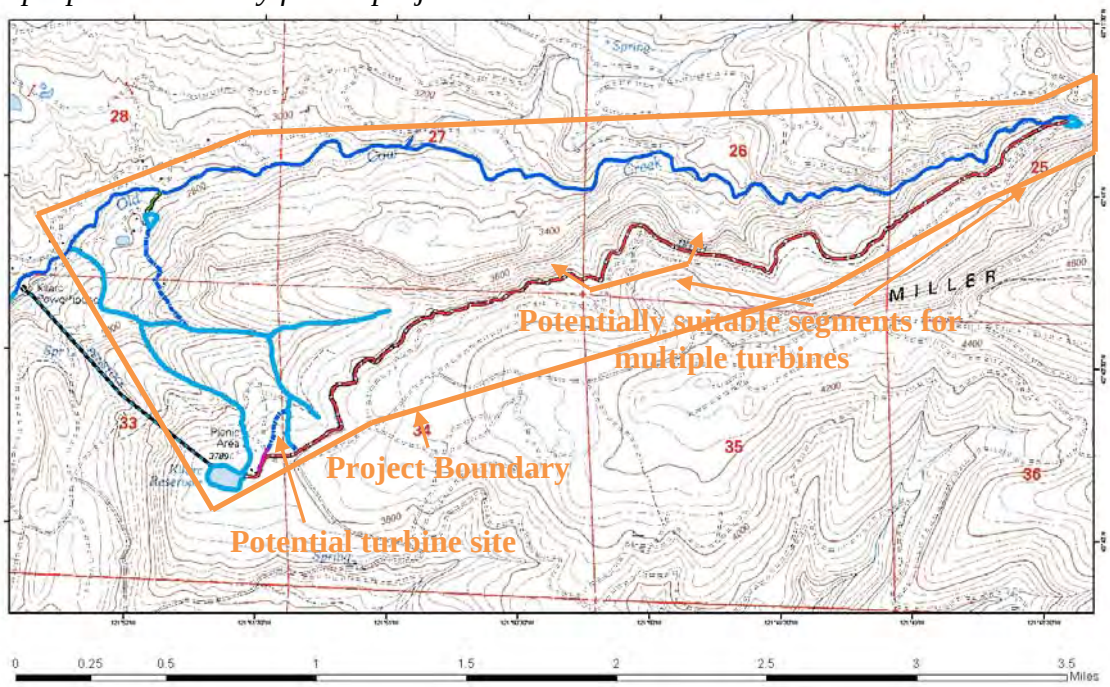
(1) *The location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any permanent monuments or objects that can be noted on the maps and recognized in the field*



(2) *The relative locations and physical interrelationships of the principal project features described in Exhibit 1 to this application*

AND

(3) *A proposed boundary for the project*



(4) *Relationship to the National Wild and Scenic Rivers System*

No areas within or in the vicinity of the proposed project boundary are known to be included in or have been designated for study for inclusion in the National Wild and Scenic Rivers System.

(5) *Relationship to the Wilderness Act*

The project is not known to be located within any area that has been designated or recommended for designation as wilderness area or designated as wilderness study area.

143 FERC ¶ 61,047
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;
Philip D. Moeller, John R. Norris,
Cheryl A. LaFleur, and Tony Clark.

Fall River Valley Community Service District Project No. 14433-001
KC Pittsfield LLC Project No. 14434-001

ORDER ON REHEARING

(Issued April 18, 2013)

1. On January 17, 2013, Commission staff issued an order dismissing competing preliminary permit applications submitted by Fall River Valley Community Service District (Fall River) and KC Pittsfield LLC (KC Pittsfield) for the Kilarc Open-Channel Turbines Hydro Project No. 14433-000 and the Kilarc Open-Channel Turbines Hydro Project No. 14434-000, respectively.[1] These applications proposed to study the feasibility of developing hydropower on Kilarc Canal, a feature of Pacific Gas and Electric Company's (PG&E) licensed Kilarc-Cow Creek Project No. 606, located near the town of Whitmore in Shasta County, California. On February 19, 2013, KC Pittsfield filed a timely request for rehearing of Commission staff's dismissal.[2]

Background

2. The Commission issued a license for PG&E's 4.6-megawatt Project No. 606 in 1980, with an expiration date of March 27, 2007.[3] The project includes two developments, Kilarc and Cow Creek. As pertinent to this order, the Kilarc

[1] *Fall River Valley Cmty. Serv. Dist.*, 142 FERC ¶ 62,042 (2013).

[2] KC Pittsfield seeks rehearing of Commission staff's dismissal of both Fall River's and KC Pittsfield's applications. However, under section 313(a) of the Federal Power Act, a request for rehearing may be filed only by a party to a proceeding. 16 U.S.C. § 825*l* (2006). KC Pittsfield is not a party to Fall River's proceeding. Therefore, its request for rehearing of the dismissal of Fall River's permit application for Project No. 14433-000 is rejected.

[3] *See Pacific Gas and Electric Co.*, 10 FERC ¶ 62,112 (1980).

Development consists of: (1) three small diversion dams (North Canyon Creek, South Canyon Creek, and Kilarc Canal Diversion Dams); (2) a 13-foot-high earthfill dam (Kilarc Dam) impounding a 4.5-acre forebay (Kilarc Forebay); (3) 4.7 miles of canal, including the 3.65-mile-long Kilarc Canal; (4) a 4,801-foot-long penstock (Kilarc Penstock); (5) a powerhouse (Kilarc Powerhouse) containing two generating units with a total rated capacity of 3.23 megawatts; and (6) a short 60-kilovolt transmission line.

3. As licensed, Kilarc Canal, which has a capacity of about 50 cubic feet per second (cfs), receives water from three sources. At the head of Kilarc Canal, the Kilarc Canal Diversion Dam diverts water from Old Cow Creek into Kilarc Canal. In addition, water from North Canyon Creek diverts at the North Canyon Creek Diversion Dam into the North Canyon Creek Canal, which carries water to South Canyon Creek. Water from South Canyon Creek diverts at the South Canyon Creek Diversion Dam into the South Canyon Creek Canal, which flows into the South Canyon Creek Siphon and then into the Kilarc Canal downstream of the Kilarc Canal Diversion Dam. The Kilarc Canal delivers these aggregated water supplies to the Kilarc Forebay, where the impounded water flows through the Kilarc Penstock to the Kilarc Powerhouse. From the powerhouse, water discharges into Cow Creek about four miles downstream from the Kilarc Canal Diversion Dam.

4. The deadline to file applications to relicense the project was March 27, 2005. On March 31, 2005, PG&E notified the Commission that it would not seek a new license for the project based on its determination that decommissioning the project was a viable and cost-effective alternative to relicensing.[4] On April 7, 2005, the Commission solicited applications from potential applicants other than the licensee.[5] When no one timely filed a license application,[6] PG&E submitted its surrender application, proposing to remove the North Canyon Creek, South Canyon Creek, and Kilarc Canal Diversion Dams and

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[4] *See* March 31, 2005 letter filed by PG&E in Project No. 606-000. In 2002, PG&E had filed a notice of intent to file an application for a new license for the Kilarc-Cow Creek Project. However, following consultations with stakeholders, PG&E decided to surrender its license and partially remove the project facilities. This decision was the result of an agreement between PG&E, state and federal resource agencies, and non-governmental organizations.

[5] *See* 18 C.F.R. § 16.25 (2012). That section provides that an applicant must file, within 90 days, a notice of intent to submit a relicense application and must file its relicense application no later than 18 months after filing its notice of intent. 18 C.F.R. § 16.25(b) (2012).

[6] On June 27, 2005, Synergics Energy Services filed a timely notice of intent to file a relicense application, but never submitted its application.

thus dewater Kilarc Canal. PG&E also proposes to remove Kilarc Dam and fill in Kilarc Forebay. The surrender proceeding is pending before the Commission.[7]

5. On July 13, 2012, KC Pittsfield filed an application for a preliminary permit to study the feasibility of the Kilarc Open-Channel Turbines Hydro Project No. 14434-000. The project would develop the energy potential of Kilarc Canal's 50-cfs flow by using up to five two-kilowatt (kw) open channel turbine generators, which would be placed in three segments of Kilarc Canal, for a total capacity of 10 kw. The proposed project would include the Kilarc Canal Diversion Dam and the Kilarc Canal and would operate on a run-of-release basis.

6. On January 17, 2013, Commission staff issued an order dismissing KC Pittsfield's permit application, explaining that it would not issue a preliminary permit for a project that would use facilities proposed to be surrendered and removed. Citing to the Commission's order in *Thermalito Afterbay Hydro, LLC (Thermalito)*,[8] the order stated that the Commission would not accept preliminary permit or development applications for the site until after the Commission acts on the surrender proceeding.

7. On February 19, 2013, KC Pittsfield filed a timely request for rehearing.

Discussion

8. KC Pittsfield argues Commission staff erroneously relied on *Thermalito.* It contends that in *Thermalito* "the water resource itself would potentially be unavailable to the permit applicant" due to the licensee's potential future use of the water, whereas here it is the project facilities that carry the water that might not be available.[9]

9. We disagree. The facts in *Thermalito* support Commission staff's dismissal of KC Pittsfield's permit application. In both cases, whether the water resource proposed for development by a permit applicant would actually be available for development would depend on the outcome of pending proceedings (i.e., a relicense proceeding in *Thermalito* and a license surrender proceeding here). Because PG&E proposes to remove the dams, dewater Kilarc Canal, and fill in Kilarc Forebay, KC Pittsfield's proposal is wholly dependent on the outcome of PG&E's surrender proceeding, and we accordingly affirm

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[7] *See* PG&E's March 13, 2009 Filing in P-606-027. On August 16, 2011, Commission staff issued a Final Environmental Impact Statement (FEIS) for the surrender, recommending adoption of PG&E's surrender proposal. *See* FEIS at Section 4.4.

[8] *Thermalito Afterbay Hydro, LLC*, 132 FERC ¶ 62,008 (2010), *reh'g denied*, 133 FERC ¶ 61,053 (2010).

[9] Rehearing Request at 2-3.

the dismissal of KC Pittsfield's permit application.[10] Should the outcome of the surrender proceeding result in the project facilities remaining in place, KC Pittsfield or any other applicant can file a preliminary permit application for the site.

10. Citing to *KW Sackheim Development*,[11] KC Pittsfield asks instead that the Commission issue a preliminary permit to it with a condition that if PG&E proposes to develop the same incremental capacity of the Kilarc Canal, then KC Pittsfield would lose its permit priority to develop that capacity. However, such a condition is inapplicable here as PG&E proposes to surrender the project facilities, not develop them.[12]

11. For the above reasons, we affirm the dismissal of KC Pittsfield's preliminary permit application for Project No. 14434.

The Commission orders:

(A) The request for rehearing filed by KC Pittsfield LLC in Project No. 14433 on January 17, 2013, is rejected.

(B) The request for rehearing filed by KC Pittsfield LLC in Project No. 14434 on January 17, 2013, is denied.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.

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[10] *See also Skokomish Indian Tribe*, 71 FERC ¶ 61,023, at n.11 (1995). In that case, the Commission noted that section 4.32(j) of the Commission's regulations, 18 C.F.R. § 4.32(j) (2012), provided another possible basis for dismissing the permit application. That section provides that "any application, the effectiveness of which is conditioned upon the future occurrence of any event or circumstance, will be rejected."

[11] 130 FERC ¶ 62,130 (2010) (issuing permit for project proposing to develop incremental hydropower of licensed project undergoing pre-filing stages of the Commission's relicensing process).

[12] KC Pittsfield also raises questions regarding the adequacy of Commission staff's analysis in the FEIS for the Project No. 606 surrender proceeding. However, those issues are not relevant to this proceeding, and to the extent they have been raised in the Project No. 606 proceeding, they will be addressed there.

Parks, Jeff@Waterboards

Subject: FW: The Davis Hydro Alternative Relevant to P-606 (Kilarc) Water Quality Certification
Attachments: TheDavisHydroAlternative.pdf

From: Kelly W. Sackheim [mailto:kelly@kchydro.com]
Sent: Friday, April 19, 2013 12:27 PM
To: Parks, Jeff@Waterboards; Dick@DavisHydro.com
Cc: [private]
Subject: The Davis Hydro Alternative Relevant to P-606 (Kilarc) Water Quality Certification

Jeff - While Dick Ely is back working on operating sites in Maryland, New Hampshire, and Vermont, he asked me to forward to you the attached brief synopsis of the most relevant aspects of the Davis Hydro Alternative, that has been evolving and presented in substantial detail in multiple FERC filings. You may want to review FERC Accession Nos. 20110114-5162, 20080707-5045, 20080425-5015, 20070919-0009, 20070731-5001, 20070517-0080, and 20070427-5112 (details of DH Alternative itself), and 20080828-0200 (erroneous facts and flawed logic of PG&E), 20090331-5019, 20080917-5001, 20070926-5034, 20070926-0057, 20070917-5001, 20070531-3003, (comments related to DH Alternative), filed on P-606 for additional detail. Please let us know if you have further questions as you undertake development of the draft EIR and conditions of Water Quality Certification.

Kelly

p.s. Could you tell us if there have been any other comments filed since the scoping meeting that have NOT been filed on FERC eLibrary? And, perhaps provide a copy by e-mail today, if it is not possible to get such comments up on the Water Boards website before your Monday deadline? I would like to facilitate your work by providing corrections or any additional information that may clarify the flaws and deficiencies in the data and arguments that may be made by other commenters.

Mr. Parks,

The following comment is submitted as a component of the Scope of work of your investigations so as to see that there is an alternative to demolition. We request you consider a process that permits serious evaluation of alternatives such as described below. We request you consider and include in your analysis off-site effects of the demolition through the businesses involved and through the off-site environmental destruction that will be effects directly and indirectly triggered as alternative power facilities are constructed and this project decommissioned. All these businesses create environmental damage and through normal economic input/output (I/O) multipliers this damage is spread worldwide. FERC is well aware of the limitations of their analysis and this gives an opportunity for California to show how it should be done.

As a viable Alternative, please consider:

The Davis Hydro Alternative

The following schematic description is presented as a template for a Davis Hydro License to operate in Project P-606. Davis Hydro has an interest in operating only the Kilarc facility as a profit-making entity that will provide significant fisheries and community benefit for the area. This description is intended as schematic representation of the proposed alternative addressing the known constraints and goals of all parties.

In summary, these potential components comprise the Davis Hydro Alternative which will evolve as more facts and agency and community desires become clear. The best option(s) will be presented to the FERC and the state at the appropriate time. Simply put, Davis Hydro is interested in participating and is flexible on the appropriate structure.

Definitions:

<u>Davis Hydro</u>

Davis Hydro is Davis Hydro LLC, (DH) a company owning significant shares in four small hydro sites in the North East. On the Cow, DH will form and managing a new California LLC for the sole purpose of owning and/or operating, for profit and the other benefits, the Kilarc Hydroelectric project. DH is engaged in and will directly support fish-related research and resource habitat enhancements directly.

The Kilarc Foundation

The Kilarc Foundation (Foundation) is a non-profit foundation set up in 2010 to help and enhance anadromous (salmon and steelhead) and recently catadromous (eels) fish resources. It is currently funded by Davis Hydro to work on fish potentially impacted by their operations. The Foundation's work would be expanded and directed by people appropriate for the site – in this case Cow Creek anadromous fish. The Foundation's activities include conservation, habitat enhancement, and research for these fish. Resource Agency people are wanted as Board members or Project advisors.

The Land Title Holder

This entity will own the land on which the Kilarc facility operates.

The Local Oversight Entity

An independent entity might best represent community and fish resource interests. This entity could direct conservation, research, and community activities. This role is similar to managers of conservation easements management group such as Western Shasta RCD or the Shasta Land Trust. It would be logical to have a representative on the Kilarc Foundation Board.

FERC

The Federal Energy Regulatory Commission (FERC) regulates all aspects of hydropower generation. Power generation is possible only with compliance of all FERC License conditions. License conditions govern operation, environmental mitigation, community operation, resource agency, and utility interactions.

Sample Schema

In the simplest scheme, the P-606 License is divided into two areas. Davis Hydro applies for a license to operate the Kilarc Site. The FERC terms and conditions of the license require significant efforts by DH to address resource problems in both the Old Cow and the South Cow areas. These can be addressed through the Kilarc Foundation which is directed by agency and community representatives.

In a more complex FERC license scheme, the P-606 FERC Project is split into two projects for analysis and disposition. The Kilarc Fee Title is controlled by Cal Fire or similar entity. An independent Conservation Supervisor such as Sierra Land Trust. Davis Hydro as the hydro operator responds to the needs of both as directed in its License.

Other arrangements are possible, and workable. For example: The Kilarc Foundation is the FERC License & Fee holder, and hires Davis Hydro as the Operator.

In all models, Davis hydro is responsive to Community and Resource issues as dictated by FERC either directly – as is the conventional model, or through the Kilarc Foundation and described here. For the moment, Dr. Ely continues to serve as an initial Kilarc Foundation Director, until other more interested in the fish are found by the Kilarc Board. Currently, the Foundation is working on American Eel passage reflecting funding and agency support at the east coast hydro sites. Hopefully, this will change to more work on local anadromous fish with Kilarc Funding.

The Kilarc Foundation under Dr. Ely will:

Provide a specific forum for balancing community and resource goals,
Act directly to effect habitat and species genotype improvement projects,
Study ways to genetically and epigenetically enhance anadromy,
Seek matching grant funding amplifying what is generated from the hydro operations.

With Kilarc Project funding, Dr. Ely will take a smaller role focusing on research and project implementation. New local board members will be elected.

Other issues:

<u>Funding:</u> Currently Davis Hydro is funding the work at the Kilarc Foundation. The Kilarc project will, under FERC mandate expand that significantly as the Kilarc Project generates profits. It is intended that a target of 1/3 of the profits the Kilarc Project will go directly to the Foundation to be used as directed by its Board.

<u>South Cow:</u> Davis Hydro is willing and as part of its license, if asked, would provide funding through the Foundation to address all issues on the South Cow. Locally, and only in partnership with local landowners, these efforts would include mechanisms to address local proposals such as:

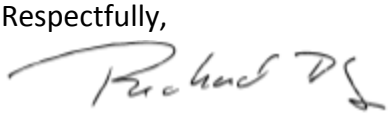
Coanda screened intakes and fish passages on the South Cow,
Ditch lining to reduce water loss -- providing more water where needed,
Fencing and fish habitat enhancements where permitted,
Funding ditch tending to conserve water and reduce runoff.

The conflicting interests of the fish, the fishermen, ranchers and community need to be resolved with a solution that minimizes the concessions made by any party. However, under hydropower funding and FERC mandates, we can provide a solution that meets nearly everyone's goals while continuing to generate green power and greatly improving fish resources and habitat.

Off Project: The FERC measured its project environmental impact so narrowly that it did not account for most of the project effects that occur off-site. I hope the environmental effects of in house work done on-project (the lab, the research, the small hatcheries, juvenile habitat creation, etc.) are tiny relative its works off-site on behalf of the fish. This summer we will be mapping illegal and unscreened diversions on the upper Sacramento building on the work done by the State and Federal government. This work will be a parallel effort to the state diversion screening effort, but done quietly and privately. We will also be mapping small spawning grounds, for future insemination with ancestral stock. We hope to be an independent public voice addressing bass predation. We continue to work on understanding the genetic and epigenetic causes of behavior and seek by funding research ways to enhance desired behaviors and have it proliferate

In summary, Davis Hydro is willing to take over the operation and license problems of the Kilarc site and do so in a way that will fund environmental improvements not only for the local fish and community, but directly through emissions reductions and fisheries research to the whole state and nation. We are flexible and dedicated to a project that maintains green power at the Kilarc site and using its generation for environmental enhancement. We do not care what form that takes. It is clear to us that it make no sense to tear down an existing green power source that may easily be shown to be directly benefitting the fish downstream, and can and will be used to benefit the fish indirectly through the Foundation.

Respectfully,



Richard Ely,
Principal, Davis Hydro,
Director (pro tem), The Kilarc Foundation

Parks, Jeff@Waterboards

Subject: FW: Comment Letter - Kilarc-Cow NOP
Attachments: CommentLetter-Kilarc-CowNOP.pdf; Tetrick-ADU_Tech_Solution_with_Topo_Map_4-20-2013.pdf

From: bnotnats@aol.com [mailto:bnotnats@aol.com]
Sent: Sunday, April 21, 2013 5:48 PM
To: Parks, Jeff@Waterboards; Parks, Jeff@Waterboards
Cc: Mejia, Carlos@Waterboards
Subject: Comment Letter - Kilarc-Cow NOP

Jeff,

This email succeeds the one that I sent to you on April 17. Also, we had sent a duplicate copy certified mail so please disregard that one too, as it was the same as the one sent via email on Aprip 17th.

I apologize in advance for any inconvenience this may cause your staff.
Should you have any questions, please do not hesitate to contact me.

Best regards,

Bob Stanton
[private]

Robert J. and Debra L. Stanton
26948 South Cow Creek Road
Millville, California 96062
(530) 547-4001
bnotnats@aol.com

Comment Letter – Kilarc-Cow NOP

Sent Certified Mail

April 17, 2013

Mr. Jeffrey Parks
Jeff.Parks@waterboards.ca.govhide
jparks@waterboards.ca.gov
Water Resources Control Engineer
State Water Resources Control Board
Sacramento, CA 95814

Re: Abbott Ditch Users and deleterious affect decommissioning will have on their pre-1914 water rights adjudicated in Cow Creek Adjudication Decree No. 38577 dated August 25th, 1969

Dear Mr. Parks,

It was nice talking with you and Carlos Mejia at the public scoping meeting in Palo Cedro, CA, last Wednesday, April 10th. Your candor and concern in addressing our interests were encouraging. For some reason our water rights were never seriously considered in any public document filed by either PG&E or FERC. It has been a long seven years of uncertainty regarding our water rights and whether they would either be preserved, diminished, or destroyed. It is my sincere hope that the State Water Resources Control Board ("Board") includes the interests of the Abbott Ditch Users ("ADU") in their 401 Water Quality Certification ("WQC").

We have a one-sixteenth interest in Abbot Ditch and have exercised our water rights since acquiring the property in 1998. The Board has on file information regarding our individual *"Statement of Water Diversion and Use S016862 for Diversion from South Cow Creek in Shasta County"* that was filed on June 20, 2010. We have a letter from the

Board's Division of Water Rights signed by Bob Rinker, Manager, Fee and Data Management Unit confirming that the Division has reviewed and accepted our Statement related to our pre-1914/Court Decree #38577 claim.

Brief History

In 1852 Erastus Wagoner settled in the South Cow Creek Valley. Wagoner Ranch is now commonly known as Tetrick Ranch. Ranches along South Cow Creek ("SCC") predate the power project by many decades, and their lands were removed from Public domain long before Northern Light & Power ("NLP") began planning the project in 1904 and finalized it in 1907. In 1908 NLP sold the South Cow Creek Powerhouse ("SCCP") to Sacramento Valley Power ("SVP") and in 1912 SVP sold it to Northern California Power ("NCP"). In 1919 PG&E purchased the SCCP from NCP.

In 1907 when the SCCP was developed, the ADU entered into an agreement with NLP that permitted them to utilize our water rights for power prior to delivering the ADU water to Hooten Gulch, a natural channel that merges with SCC a short distance downstream from the head gate to Abbott Ditch. As a result, the ADU ceased to divert from their legal point of diversion on SCC in 1907. From 1907 to 1919 either NLP, SVP, or NCP delivered a continuous flow of water to Abbott Ditch via Hooten Gulch until PG&E acquired NCP in 1919. From that point forward PG&E has delivered a continuous flow of water to the Abbott Ditch via Hooten Gulch. It is believed that the pre-1907 Abbott diversion is located on Tetrick Ranch in a location where the SCC stream bed has been eroded down nearly 15 feet over the years due to natural erosion.

Over the years there has been confusion regarding the legal point of diversion of Abbott Ditch. Even topographical software such as Garmin and National Geographic show the Abbott Ditch point of diversion incorrectly on SCC downstream from the confluence of SCC and Hooten Gulch. In this location water would have to travel uphill to reach Abbott Ditch. Clearly these maps are in error. Also, many have believed the correct point of our diversion to be the pre-1907 location on SCC. But this too is not the correct location.

Fortunately, there is no longer any confusion as to the location of the diversion the ADU have received water from since 1907 as it is now defined in Adjudication Decree No. 38577 ("Adjudication") as **Diversion 73**. On January 30, 2012, per case number **68-38577,** Shasta County Superior Court Judge Jack Halpin ruled that:

"Erik Poole's motion to amend or modify the Cow Creek Adjudication Decree Legal description of the Abbott ditch Point of Diversion in Schedule 2 is granted."

Apparently a clerical error in the Adjudication had our diversion in the wrong location: there are many diversion locations that are also described incorrectly in Schedule 2, including PG&E Diversion 64; the South Cow Creek dam for the powerhouse.

While prior to Judge Halpin's decision Diversion 73 was incorrectly positioned in the Adjudication, ADU rights with respect to Diversion 73 from SCC have always been legally well phrased in the Adjudication. In the Board's May 1965 report regarding the Adjudication it clearly documents and understands that for Diversion 73 water is not physically & directly taken from South Cow Creek as evidenced in part by this quote:

"Water available for diversion consists principally of water discharged into Hooten Gulch through the South Cow Powerhouse tailrace…"

ADU and PG&E

Until Judge Halpin's January 30, 2012 decision to correct the location of Diversion 73 in the Adjudication, it was believed by many, including PG&E and myself, that the ADU's legal point of diversion was at SCC, not Hooten Gulch. In which case, one could have argued that the ADU were responsible for maintaining this pre-1907 diversion on SCC over the past 106 years: this pre-1907 diversion is the aforementioned diversion where the SCC stream bed is now 15 feet below the bank due to 106 years of erosion. However, in light of Judge Halpin's ruling, that argument is no longer persuasive.

Additionally, NLP developed a dam at its current location (Diversion 71) which prevented ALL flows up to 40 cubic feet per second ("CFS') from going down Wagoner Canyon, were SCC flows after the SCC Forebay. So, in the event water flows fell below 40 CFS in any given year, PG&E had the right, and the means, to divert 100% of the water in SCC to the SCCP - during irrigation season it is not uncommon for the flows in SCC to decline below 40 CFS. So, during years of low water flows - primarily late summer - ALL water in South Cow Creek was being diverted to the SCCP, leaving no water available at the pre-1907 Abbott diversion. No doubt this is one reason the ADU of 1907 permanently moved their diversion to Hooten Gulch, and why the Adjudication did as well.

My understanding is that PG&E views their water rights to be superior to those of the ADU because theirs are exercised upstream from the ADU's rights. This is interesting because both the ADU's water rights and PG&E's water rights came from the same source, Wagoner Ranch, so I do not understand how they can be superior…delivered first, yes, but superior, no. In reviewing NLP's original notice of appropriation from 1906, it is very clear what the purpose was: to deliver water to the upper end of the South

Cow Creek Valley for irrigation and power production to the Wagoner Ranch. It's hard to imagine that the Adjudication allows for any upstream user to destroy the delivery system of any downstream user. One thing is certain; nobody foresaw that the infrastructure of the SCCP would ever be dismantled. There's no doubt that this has been a factor which has complicated matters for both the ADU and PG&E throughout this process.

I am deeply concerned that PG&E continues along their pre-Halpin path of standing firm on their position that they have no legal responsibility for ensuring that the ADU's water rights are preserved, while at the same time the ADU believes strongly that PG&E is responsible for preserving their water rights. This chasm between PG&E and the ADU is likely the main reason an agreement has not yet been reached. It is unfortunate because we were close, but now time has run out as the CEQA process has recently begun and we will be closely watching the process to ensure we are not damaged in any way.

Past comments made by the Board regarding the ADU's water rights

Based on the Board's filings before FERC, it appears willing to take steps to advance a settlement as the Board made clear in there August 25, 2010 comments on FERC's draft EIS ("DEIS"):

"*… the protection of the State's water rights holders is at issue, as well as consistency of the outcome with the State's law*.

Therefore, regardless of whether PG&E is given permission by FERC to remove Project diversions on South Cow Creek, no removal would be performed until the water rights of downstream users are *protected and maintained*. The adjudicated location of downstream water rights and the dispensation of PG&E's water rights post-surrender are a matter for the Shasta Court and the Board to decide.

The Board has expressly stated that the resolution of the ADU's water rights by an appropriate state agency or court is a pre-condition for any decommissioning of Project 606.

<u>ADU solutions explored since the FERC rejection of the Shasta County, ADU, Evergreen Shasta, LLC and Tetrick Ranch proposal as Interveners</u>

Pump Station Option:

Twelve-sixteenths of the ADU's water rights are held by fourth and fifth generation ranchers whose ancestors settled our valley in the late 1800s, and those ADU lease land from three-sixteenths of the remaining four-sixteenths of the ADU's interests. In other words, fifteen-sixteenths of the land currently being irrigated by Abbott Ditch is grazed by livestock owned by those fourth and fifth generation ranchers.

The primary source of income for these ranchers is from the sale of their livestock. If these ranchers are forced to bear the financial burden of maintaining a pump station, paying for power from PG&E to operate the pumps, and maintaining Abbott Ditch – to say nothing of installation and permitting costs - their ranches would be unsustainable and they would discontinue irrigating, thereby rendering the ADU's water rights worthless.

Certainly this option would neither preserve nor maintain the ADU's water rights, it would destroy them.

Gravity Fed Option – North Side of South Cow Creek:

Constructing a diversion on the north side of SCC, which is the opposite side that Abbott Ditch is on, would require permits to construct a bridge in order to gain access to the north side from the south side. There would be construction costs for the new bridge, permits for a new diversion, roads for access, and new easements would need to be negotiated. And since Abbott Ditch is on the south side of SCC, water coming from the north side would require an apparatus to be constructed that would transport the water from the north side, either over or under SCC, to the south side for delivery to a new head gate somewhere along Abbott Ditch, which would mean even more permits and more construction costs.

And after all of that, once the water emerges on the south side of SCC from the north side, there is high probability its altitude will not be high enough to reach Abbott Ditch. Why? Because in order to circumvent Tetrick Ranch (a prerequisite for this option) the water must cross SCC downstream from Diversion 73 at Hooten Gulch.

The ADU believe this option to be too complex, too costly, far inferior - and perhaps even impossible – when compared to a gravity fed option on the south side of SCC, where an existing and time tested delivery system is already in place.

Gravity Fed Option – South Side of SCC known as Technical Solution

Given the fact that Diversion 73 is located at Hooten Gulch, and that a natural channel ("East Channel") already exists on the Tetrick Ranch which connects SCC to Hooten Gulch just upstream from Diversion 73, we believe the only reasonable, feasible and least expensive way to deliver gravity fed water to Diversion 73 is through this East Channel.

Any new water conveyance facility agreed to by PG&E and the ADU/Tetrick will need to be supported by the resource agencies and approved. Also, this conveyance facility would need to be in place prior to any discontinued flow of water supplied to Hooten Gulch from the SCCP tailrace due to dismantling the SCCP infrastructure.

In my opinion, this gravity fed solution from the south side of SCC is our only viable option. To this end, my hope is that the Board will facilitate meetings between key resource agencies, PG&E, and the ADU so that we can all begin forging a path towards preserving the ADU's Adjudicated pre-1914 gravity fed water rights.

For a more complete review of Technical Solution please see attached file titled **"Tetrick-ADU_Technical_Solution"**

In conclusion, we would like to thank you and Board in advance for your consideration on the most urgent matter. Should you have any questions please feel free to contact us.

Respectfully submitted,

Robert J. Stanton
Chartered Financial Analyst
Certified Public Accountant (retired)

Debra L. Stanton

26948 South Cow Creek Road
Millville, California 96062
(H) 530-547-4001
(C) 530-356-5445

April 20, 2013

Technical Solution to Resolve Tetrick Ranch / ADU Loss of Water from Decommissioning Project No. 606

Problem:

The proposed PG&E and FERC solution described as the preferred alternative in the Final Environmental Impact Statement (FEIS) for the decommissioning of FERC P-606 includes removing the Cow Creek powerhouse and eliminating the facilities that deliver the associated tailrace water that currently feeds Hooten Gulch. However this water supplies the Tetrick Ranch and Abbott Irrigation Ditch. Removal of the water from the tailrace also degrades the wetland-aquatic-riparian habitat along 0.5 miles of Hooten Gulch, which is known to support listed steelhead during portions of the year. The Tetrick Ranch and Abbott Ditch Users (ADU) as landowners and water rights holders have developed a solution to the problems associated with loss of habitat for listed anadromous salmonids and the FEIS failure to maintain water delivery to the ADU.

Solution:

The proposed project would re-establish approximately 1,200 feet of the historic east channel of South Cow Creek so that it once again flows into Hooten Gulch and thus continues to provide water to the historic and current Abbott Diversion. This solution also maintains flow in an additional 1,200 feet (approximately) of Hooten Gulch downstream of the confluence of the restored east channel that would be lost under the preferred alternative in the FEIS.

Project Elements would include:

- Construct a rock weir to deliver water from the existing east channel of South Cow Creek into a restored historic channel that contained flows prior to channelization of the main stem of South Cow Creek in the 1940's.
- The project would restore the aquatic and riparian habitat and adjacent floodplain within the historic channel (1,200 feet) such that fish habitat value is optimized and wetland habitat would be created.
- The boulder weir would be designed to allow fish passage and feature a failsafe diversion that allowed peak flows to continue to the main stem of South Cow Creek should they exceed the capacity of the restored channel.
- The newly restored channel banks would be stabilized with on-site rock, planted with native riparian vegetation and fenced to exclude livestock as necessary.

- The Project would maintain existing aquatic habitat in the lower quarter mile of Hooten Gulch by reestablishing historic flow from the restored east channel of South Cow Creek (this portion of Hooten Gulch would be dried up following the planned removal of the P-606 facilities).
- Reestablishing this flow in Hooten Gulch via restoration of the historic east channel minimizes changes to the existing water delivery pattern and maintains the Abbott Ditch Diversion 73 in its original and current location as corrected by the Shasta County Superior Court, January 30, 2012, per case number **68-38577.**
- The project would install a fish screen and ladder at the currently unscreened and un-laddered Hooten Gulch diversion dam (Diversion 73).
- Because the restored east channel will be designed as optimum fish habitat, screens are not needed at the inflow and outflow of the channel and fish will be encouraged rather that prevented from using this habitat.
- Adequate flow will be maintained in the restored channel because PG&E bypasses will be restored causing increased year-round flow in South Cow Creek.

Project Components:

- Fish screen and ladder at the Abbott Diversion
- Restoration and maintenance of up to 2,500 linear feet of salmonid habitat with a 1-3% gradient, substrate optimized for spawning, and stable, vegetated banks.
- Create and maintain up to 3 - 5 acres additional acres of wetlands
- A fish passable and failsafe rock weir design at the inflow of the re-established channel
- Fencing to eliminate bank damage from livestock
- Additional shade in the restored areas

Project Benefits:

- The FERC and CEQA process for the South Cow Creek portion of the PG&E proposed P-66 decommissioning can be solved with this project's approval.
- The historic and current diversion point of the Abbott Ditch remains unchanged.
- Project work could begin during periods of low flow as early as August 2014.
- No new screened diversion will need to be constructed in the main stem of South Cow Creek which is prone to flooding.
- No new roads or power lines will be required to operate a mechanical screen.
- Land owner cooperation.
- Additional 2,500 linear feet of ideal gradient for fish habitat.
- Maintains 1,200 linear feet of Hooten Gulch or fish and aquatic habitat.

Project Process:

- Buy-in of the stakeholders
- Settlement with PG&E
- Buy-in of resource agencies
- Project design benefits listed salmonids
- 1600 permit
- CEQA

Project Timeline:

- Stakeholder review of proposed project
- Settlement conference

Existing Channel

Restored East Channel

VESTRA

SOURCE: BING 2011

0 175 350 700 Feet

FIGURE 1
TETRICK RANCH TECHNICAL SOLUTION
RESTORED EAST CHANNEL
TETRICK RANCH
SHASTA COUNTY, CALIFORNIA

P:\GIS\70935\70935_ProposedChannel.mxd

Parks, Jeff@Waterboards

From: hswriter@frontiernet.net
Sent: Thursday, April 18, 2013 8:42 PM
To: Parks, Jeff@Waterboards
Cc: laurie.warnerherson@cardno.com; Mejia, Carlos@Waterboards

Comment on State Water Board NOP on Kilarc-Cow Project Proposed license Surrender FERC #606

April 18, 2013

Jeffrey Parks
Water Resource Control Engineer
Water Quality Certification Program
Division of Water Rights
State Water Resources Control Board
(916) 341-5319

Thank you for conducting a much needed review of the PG&E Kilarc decommissioning proposal.

My first concern over the project is that the EIS ignored all environmental impacts outside the immediate area of the decommissioning. An adequate environmental review of the project can not be achieved without considering cumulative and comprehensive impacts. For example, if the Abbot Ditch were no longer flowing, what would happen to the animals and plants that have depended on that water source for over a hundred years?

At the State water board scoping meeting on April 10th, 2013, I submitted a letter. The letter was to Kimberley D. Bose, Secretary of FERC dated January 20th, 2012 This letter is in regards to PG&E promising the South Cow Creek Ditch Association in 2002 that they would surrender their shares on the German Ditch (off of South Cow Creek) back to our ditch association upon decommissioning. (attached documents missing from my submission are available on FERC's website).

The issue of PG&E deceiving us and trying to put us off until it is too late is clearly spelled out in my letter of January 20th, so I will not repeat the same facts. At the scoping meeting you stated your agency has authority regarding water rights. I ask that your agency protect our association's pre-1914 water rights by making it a mandatory condition that PG&E provide the promised legal conveyance of their shares on the German Ditch to the South Cow Creek Ditch Association before decommissioning.

California is the leader in alternative energy. The Federal Energy Regulatory Agency's scope of alternatives was grossly inadequate for our state's needs. The scope was limited only to options PG&E itself considered financially feasible. PG&E said there were no financially feasible options for its company. The two alternative energy companies eager to take over the facility were not only ignored as an alternative,but discouraged.

I support the following mandatory condition:

Mandatory Condition: Impacts of dismantling of PG&E's canal and construction of substitute facilities for reasonably foreseeable future beneficial use of the water resource shall be avoided by allowing facilities to be recommissioned rather than dismantled.

Salmon have never been seen above the Whitmore Falls. Fish experts have testified it is impossible for salmon, especially in their condition coming back to spawn, to jump over the falls. The 'possible' existence of salmon above the falls has been studied extensively. The ever present Steelhead trout have been ignored in the Kilarc EIS. Steelhead trout live in Kilarc lake, Old Cow Creek and South Cow Creek. I see them every year when the German Ditch (off of South Cow Creek) is closed for two days for maintenance. A thorough study of the Steelhead is necessary for a complete study.
Thank you warmly for your help to ensure our community is fairly treated.

Sincerely,

Heidi Strand
P.O. Box 172,
Whitmore,CA 96096
hswriter@frontiernet.net
(530)472-1355

April 20, 2013

COMMENTS FROM THE TETRICK RANCH REGARDING SOUTH COW CREEK PORTION OF FERC PROJECT 606.

The FERC decommissioning process of the Project has been most interesting to date, but it is this SWRCB proceeding that is the important one in light of the FERC Staff's failure to deal with the rights of the water holders and the future use of water resulting from the proposed PG&E decommissioning of Project No. 66 by dismantling the entire Project water system, in its FEIS. Unfortunately, FERC's process has not produced a resolution that will allow for the continuing use and disposition of water in the South Cow Creek Project No. 606 area. Instead, FERC Staff stated in its P-606 FEIS decision: "Whether or not the Proposed Action (of decommissioning proposed by PG&E) would violate the water rights of others is a matter to be determined by the State of California, not the Commission." FEIS at 33. Instead of deferring any evaluation until the issue of adequate protection of the water right holders was addressed, the FERC Staff ignored the issue and the important issue of the "future disposition of PG&E's abandoned water rights," as unknown; and relied on its unsupported conclusion that it was "unlikely that another entity would have an opportunity to attain the abandoned water rights in the future." These critical issues affecting State water rights and uses must be addressed in this proceeding, where FERC concedes they are properly to be determined.

Thus, we look forward to the CEQA process and urge that the State of California compel PG&E and the resource agencies to do the right and lawful thing for the residents of Shasta County, and the landowners of South Cow Creek Valley. We appreciate that the California State Water Resource Control Board is the lead agency on this process and trust that the "beneficial uses" of the water from South Cow Creek will be legally and fairly considered.

As you know, the Project has been in place for over 100 years. It is important to understand the significance of the history of the Project. Before a decision is made to undo what has become a natural "part of the environment", it is vital to understand who, when, how, and why certain things were done in the first place. Below is a brief history of the South Cow Creek side of the Project. These findings are a compilation of many sources, including but not limited to the testimony of several "long-timers" from the So. Cow Creek valley such as Art Abbott, Bud Farrell and others, FERC applications c. 1927, and 1976, SWRCA records, title information, Shasta Historical Society archives, and Shasta County records.

1) Background – "Pre-Project" Condition South Cow Creek Portion of FERC PROJECT 606

a) Long prior to Northern Light and Power constructing Project 606, "the Project", Wagoner, in 1852, settled South Cow Creek Valley and began developing and diverting 2000 miner inches (40 CFS) from South Cow Creek for irrigation of South Cow Creek Valley.

b) Prior to the Project, Wagoner designed, built, and used an elaborate ditch system across Wagoner (now Tetrick) Ranch, starting from upper S. Cow Creek, and extending along the

hillsides of the ranch, eventually watering the east channel of South Cow Creek and Hooten Gulch. The physical evidence of these many ditches still remain today as a constant reminder of the past. (Pictures can be provided upon request.) These ditches were abandoned when Wagoner worked out a deal with Northern Light and Power to generate hydro-electric power, and thus continue watering Hooten Gulch.

2) History – <u>Timeline Facts and Findings - South Cow Creek Plant</u>

a) Wagoner, predecessor to the Tetrick Ranch, settled most of South Cow Creek Valley in 1852 and developed an elaborate water delivery system from South Cow Creek to Hooten Gulch. The delivery system included several diversions, flumes, and ditches that diverted and directed water from South Cow Creek to Hooten Gulch to what is now known as Diversion 73. From Diversion 73, waters then flowed into a ditch that irrigated much of the 400 irrigable acres of the South Cow Creek Valley with a ditch system.

b) Wagoner filed a Notice of Appropriation for over 2000 miner inches in the 1880's.

c) Wagoner sells lands in west end of South Cow Creek Valley to Hunt and Farrell (ADU) in 1890's.

d) Wagoner makes agreement with Edward Smith of Northern Light and Power, "NLP", to sell 5 acres of land for a powerhouse in the middle of his ranch in 1907. Agreement enables NLP to develop hydroelectric plant and deliver Wagoner water to South Cow Creek Valley via Hooten Gulch, for Wagoner's beneficial "***use and enjoyment of the lands***", without expiration. *(See Indenture Wagoner-Smith dated July 20, 1907, <u>Appendix 1</u>).*

e) Edward Smith, Northern NLP, filed a Notice of Appropriation in 1906 for non-consumptive water rights to be delivered to the Wagoner Place (Hooten Gulch) at the upper end of the South Cow Creek Valley. *(See Smith - Notice of Appropriation dated December 3, 1906, <u>Appendix 2</u>).*

f) NLP constructed South Cow Creek dam and diversion in 1907. There was no minimum bypass developed for fish or for Wagoner senior water rights because most of Wagoner water was delivered to the South Cow powerhouse and Hooten Gulch. Only water that leaked from the dam and the ditches provided water into bypass reach through Wagoner canyon when flows in South Cow Creek were less than 40 cfs. In other words, the dam was ***terminus*** until flows in South Cow Creek were greater than 40 cfs. *(See 1965 California State Water Boards Study, Page A-90, excerpt, <u>Appendix 3</u>).*

g) NLP sells South Cow facility to Sacramento Valley Power, SVP, in 1908.

h) SVP sells South Cow facility to NCP in 1912.

i) According to PG&E and FERC records, documents between NCP, NCPC and SVP were sparse.

j) PG&E acquires South Cow and Kilarc Power plants through a merger with NCP in 1919.

k) PG&E files license application with FERC in 1927.

l) PG&E claims in its application for license to FERC, it has the right to divert water citing the history of NCP, SVP and the fact that there water was appropriated in 1906-8 in the license application. *(See Smith - Notice of Appropriation 1906, Appendix 2)*.

m) PG&E in its application for license to FERC claims that prior to 1911 there was no "water commission act". PG&E states in their Application to FERC in 1927, Exhibit E, Page 4:

> "*All of the water rights now possessed and used by applicant in connection with the aforesaid canals and power plants were vested and accrued long prior to the enactment of the first water commission act of the State of California. No certificate of approval, permit or license by any board or officer was required as a condition precedent to the appropriation and use of the water by the laws of the State of California prior to the enactment of the first water commission act in the year 1911."*

n) In the 1924 Filing with FERC, PG&E states in Exhibit H, Statement of Effect of Operation on the Normal Flow of the Stream:

> "*Above Cow Creek power-house, the forebay…has little or no effect on the stream flow as only minor regulation is possible. The water stored is beneficial for power and* ***partly for irrigation purposes*** *but has no value in flood control or navigation purposes."*

o) In both the 1927 and 1974 FERC applications, PG&E contends that documents and records from the previous owners, NLP, SVP and NCPC are sparse or nonexistent.

p) May 1, 1936 - Wagoner quitclaims 2,000 miner inches to Abbott, Ellis, Jones and Hunt Estates Company.

q) 1937 PG&E initiates lawsuit against upper South Cow Creek water users.

r) 1940's -1970's - US Army Corp of Engineers (ACOE) did significant construction in South Cow Creek. They eliminated the natural braided stream beds and created a main channel that prevented the east channel from flowing continuously to Hooten Gulch.

s) 1965 Water Board Study sites that a majority the water for Diversion 73 "consists principally of water discharged into Hooten Gulch through the South Cow Creek tailrace". *(See Appendix 3).*

t) 1969 Adjudication – includes tailrace water as "natural flow": The 1969 Decree defines "Natural Flow" as it relates to the beneficial interests of the Tetrick Ranch and the ADU. *(See 1969 Adjudication excerpt, Appendix 5).*

u) In the PG&E 1974 Application to FERC under Section IV Page 16, Section B, Fish Water Releases and Stream Operating Criteria: "There are currently ***no minimum flow release requirements*** at either of the two main Project diversion dams, Kilarc and South Cow Creek, for the maintenance of aquatic life." This further verifies that PG&E was diverting the first of 40 CFS of stream flows from South Cow Creek for the benefit of both hydro and water delivery to the Wagoner Ranch/South Cow Creek Valley and that Diversion 64 was terminus.

v) In the 1974 FERC document, Section V, Page 22, Unavoidable Adverse Environmental Effects, "The generating facilities are now ***part of the environment***, and benefit the public by providing electric power."

w) In the 1974 FERC Application, Section V, Page 25, E. Finite Resources states "All fish are renewable as long as small populations are maintained."

x) 2001 PG&E pre-consultation package (Entrix) states on Page 79 - "The flow in the canal empties into the South Cow Creek Forebay. At this point, the water enters the penstock and flows to the powerhouse. The powerhouse releases water to Hooten Gulch, a tributary of South Cow Creek. Flow in Hooten Gulch provides the water supply for the Abbott Ditch. ***Therefore, without flow through the powerhouse, Abbott Ditch water rights could not be met. Currently, the Licensee schedules powerhouse outages through the powerhouse based upon the Abbott Ditch water needs".***

y) 2005 MOU…..Pre-decision made without consulting any of the stakeholders involved. NOAA Fisheries, NMFS on their website announced an "historic early decommissioning agreement with PG&E", (2005 MOU), and claims that " over 40 miles of additional habitat will be open to anadromous fish that have been closed off for over 100 years". As landowners and stakeholders who know that there is fish bypass on South Cow Creek and the barriers at Whitmore Falls and OC11, it is clear this claim is unfounded. We have yet to see the evidence for such claim and request the SWRCB to seek clarification on this claim.

3) Situation analysis

a) PG&E's non consumptive water rights were established by earlier agreements with its predecessors. (Smith, NLP, SVP,NCPC) The Notice of Appropriation filed in 1906 by Edward Smith of NLP, that PG&E relied upon in their filings with FERC states that water is to be diverted at South Cow Creek via pipeline "to the intended point of use" to the Wagoner place. The purpose and intent of the Appropriation is clear. Wagoner settled the South Cow Creek Valley in 1852 and established his Appropriation for over 2,000 miner inches long before Edward Smith showed up. NLP developed a dam, Diversion 64, at its current location that prevented all flows up to 40 CFS from going down Wagoner Canyon and Wagoner's other points of diversions. After PG&E acquired the facilities in 1918, they claim in their two filings with FERC, 1927 and 1974, that their water rights were established by their predecessors and then set forth in the 1969 Decree. Given the fact that PG&E is in power production business and they never intended to cease high head hydroelectric operations, it was apparently never considered even in the Decree that the PG&E diversion and water delivery system to Hooten Gulch would cease. PG&E claims in its applications to FERC that all records prior to 1918 are sparse.

b) PG&E should be denied its License Surrender Application and should not be able to abandon their water rights without an "in place" physical solution to water delivery to the Wagoner Ranch. The Wagoner Ranch transferred water rights, established ranching practices, and constructed a 100KW small hydro plant with a "conduit exemption", and other improvements in reliance and dependence upon its beneficial interests in the water flows in Hooten Gulch consistent with the 1907 Indenture, Appendix 1. The ADU has irrigated its lands, have acquired lands and established improvements and their livelihood on water they own delivered by PG&E since 1907 through the South Cow Creek Powerhouse and Hooten Gulch.

c) Costs of permitting and constructing new diversions on private lands in 2013 are much different, if not impossible, than in 1904. If Wagoner understood that PG&E could cut and run at any time, turn off the water and leave their transmission lines and wires, he would have not agreed to sell his land and would have required the utility to construct a sustainable diversion somewhere else. Additionally, the land owners that have invested in the South Cow Creek Valley have done so in reliance and dependence on the water delivery system that has been in place for over a century. It appears that the landowners of the South Cow Creek valley were misled by the public utilities and the agencies over the past 100 years and during the 1969 Adjudication process because it was never assumed that the Diversion 64 would be removed.

4) Technical Solution

a) Both the Tetrick Ranch and the ADU have developed a proposed solution, "Technical Solution", (TS) for water delivery to Diversion 73 in the event the Project is to be decommissioned. Please see Appendix 6 for detail.

b) We are requesting that the CSWRCB hold a mandatory settlement conference with the parties required for approval on or before June 1, 2013. In our view the TS is a pragmatic solution and would cost an estimated $2.5-million to complete all phases, including right of ways for construction and maintenance, fees, permits, studies, design, engineering and construction. If the affected parties can agree, then the TS should be included as a part of any FERC surrender order. In the absence of agreement, SWRCB should notify FERC that it requests, as a mandatory condition, that PG&E be required to construct and pay for such a Technical Solution or its equivalent such that the water users are not adversely affected. Furthermore, it is essential that the resource agencies agree in advance that they will entertain such a resolution and promptly process the TS. Finally, PG&E should be required to take all steps necessary to assure that the water users continue to enjoy the uninterrupted and continuous water deliveries to their homes and properties to avoid economic harm.

Tetrick Ranch By: _____ Date April 20, 2012
Steve Tetrick

By: _____ Date April 20, 2012
Bonnie Tetrick

Appendix 1

Indenture Wagoner-Smith 1907

Deed 582

William G. Wagoner, et al

To Dated July 20th 1907.

J. Edward Smith.

This Indenture, made this 20th day of July, one thousand nine hundred and seven, between William G. Wagoner, Eliza Ann Wagoner, Sr., Eliza Ann Wagoner, Jr., and Charlotte Mary Ellis, (formerly Charlotte Mary Wagoner), all of the county of Shasta, state of California, the parties of the first part, and J. Edward Smith, of said county and state, the party of the second part, Witnesseth:

Whereas, Erastus Wagoner was in his lifetime the owner of the following described real estate and property, to wit: the Northeast quarter and East

D 96

half of the Northwest quarter of section 7, township 31 North, range 1 West M.D.M., and of an undivided one half interest in the Southeast quarter and the South half of the Northeast quarter and East half of the Southwest quarter of section 6, township 31 North, range 1 West M.D.M.; of which last described property, to wit: the Southeast quarter and South half of the Northeast quarter and East half of the Southwest quarter of section 6, as aforesaid, the said William G. Wagoner was and is the owner of the other undivided one half interest; and, whereas, the said Erastus Wagoner died, leaving a last will and testament which has been duly admitted to probate in the Superior Court of the State of California in and for the County of Shasta, whereby he gave and bequeathed the use and income of all his said real estate, as above described, to his surviving wife Eliza Ann Wagoner <who is hereinbefore designated as Eliza Ann Wagoner, Sr.> during her life, and upon her death the said property to become the property of said William G. Wagoner; and, whereas, the said estate of Erastus Wagoner, deceased, is still pending in said Superior Court in process of administration; and, whereas, the said party of the second part is desirous of purchasing, taking and acquiring the title in fee of that certain tract, piece or parcel of land comprising a portion of the above described lands, and hereinafter particularly described, for the purpose of using the same as a site for a power plant and for use in connection with the generation and transmission of electricity and electrical power, together

with the rights and privileges, as hereinafter set forth;

Now, Therefore, the said parties of the first part for and in consideration of the sum of ten dollars <$10>, gold coin of the United States of America, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, do by these presents grant, bargain, sell, convey and confirm unto the said party of the second part, and to his heirs and assigns, forever, all that certain tract, piece or parcel of land, situate, lying and being in said County of Shasta, state of California, in section six <6> township thirty-one <31> north, range one <1> west M. D. M., particularly bounded and described as follows, to wit:

Starting from a point two thousand four hundred and twenty-two and six-tenths <2422.6> feet west and one thousand nine hundred and seventy-two <1972> feet north of the southeast corner of said section six; running thence north eight degrees west four hundred feet to the north west corner, marked with a stake; thence north eighty-two degrees east five hundred and forty and two-tenths feet to the northeast corner, marked with a stake; thence south eight degrees east four hundred feet to the south east corner, marked with a stake; thence south eighty-two degrees west five hundred and forty and two-tenths feet to the southwest corner and place of beginning, also marked with a stake; said tract containing five acres or thereabouts;

Also the necessary right of way for roads, wagon roads, ditches, pipe lines and aqueducts

and for the erection of poles and stringing of wires to and from said site over and across the lands of the said parties of the first part, with discharge and outlet through Hooten Gulch for the water after it leaves the wheels of the plant or point of use, said rights and privileges to be used with as little damage as is practicable to the use and enjoyment of the lands of said parties of the first part.

Together with the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof.

To Have And To Hold the said premises, together with the appurtenances, unto the said party of the second part, and to his heirs and assigns, forever.

In Witness Whereof the said parties of the first part have hereunto set their hands and seal the day and year first above written.

Signed, sealed and delivered in the presence of Mrs C. Erickson. Mrs G W Telzer

William G. Wagoner <Seal>
Eliza x Ann Wagoner Sr. <Seal>
(Her mark)
Eliza Ann Wagoner Jr. <Seal>
Charlotte Mary Ellis <Seal>

State Of California, }
County of Shasta }

On this 20th day of July in the year one thousand nine hundred and seven before me, A. H. Smith, a Notary Public in and for the County of Shasta, personally appeared William G Wagoner known to me to be the person whose name is subscribed to the within instrument, and he duly acknowledged to me that he

executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my Official Seal at my office in the County of Shasta, the day and year in this certificate first above written.

A. W. Smith.
Notary Public In and For The County Of Shasta, State Of California.

NOTARIAL SEAL

State of California,
Fall River Mills } ss
County of Shasta

On this 12th day of August in the year one thousand nine hundred and seven, before me, August H. Fetzer, a Notary Public in and for the County of Shasta, personally appeared Eliza Ann Wagoner, Sr. of Millville, in the county of Shasta, State of California known to me to be the person whose name is subscribed to the within instrument, and she acknowledged to me that she executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my Official Seal at my office in the County of Shasta, the day and year in this Certificate first above written.

August H. Fetzer.
Notary Public in and for the County of Shasta State of California.

NOTARIAL SEAL

State Of California,
County of Shasta } ss.

On this 26th day of August in the year one thousand nine hundred and seven before me, A. H. Smith, a Notary Public in and for the County

of Shasta, personally appeared Eliza Ann Wagoner, Jr. known to me to be the person whose name is subscribed to the within instrument, and she duly acknowledged to me that she executed the same.

In Witness Whereof I have hereunto set my hand and affixed my Official Seal at my office in the County of Shasta, the day and year in this certificate first above written.

A. W. Smith.
Notary Public In and For The County Of Shasta, State of California

State Of California } ss.
County of Shasta }

On this 30th day of August in the year one thousand nine hundred and seven before me, A W Smith, a Notary Public in and for the County of Shasta, personally appeared Charlotte Mary Ellis known to me to be the person whose name is subscribed to the within instrument, and she duly acknowledged to me that she executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my Official Seal at my office in the County of Shasta, the day and year in this certificate first above written.

A. W. Smith.
Notary Public In and For The County of Shasta, State Of California.

Recorded At Request Of George O. Perry Sep. 26 1907 at 15 min past 10 o'clock A. M.

A. L. Webb
County Recorder.

Appendix 2

Smith - Notice of Appropriation – 1907

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Notice Of Appropriation

Notice Is Hereby Given that the undersigned, J Edward Smith, has this day appropriated and claims the water flowing in South Cow Creek to the extend of three thousand inches, measured under a four inch pressure.

That the purpose for which he claims said water is for the generation of electricity and electrical power for heating, lighting, mechanical and manufacturing purposes, for supplying cities, towns and villages with heat, light and power, for public uses and for purposes of irrigation.

The place of intended use is to be first at the place known as the John E Hamilton place on South Cow Creek in the County of Shasta, State of California, and second on the place known as the Wagoner place at the upper end of South Cow Creek valley in said County of Shasta, State of California.

into the natural channel of South Cow Creek and flow down said South Cow Creek to the place known as the St Vrain place there to be again taken out of the natural channel of said South Cow Creek by means of a ditch of equal or greater size than above specified and conveyed by said ditch to the head of a pipe line near the said place known as the Wagoner place and by said pipe line to the intended point of use on said Wagoner place.

Dated this 3rd day of December A.D. 1906.

Witnesses:

A. W Smith

J. Edward Smith.

Locator.

Appendix 3

1965 California State Water Board Study, Page A-90, excerpt:

Leakage through the diversion dam and from the ditch which runs along the hillside parallel to the creek maintain a live stream in South Cow Creek in the reach between the diversion dam and Hooten Gulch.

Appendix 4

1965 California State Water Board Study

1965 Water Board Study sites that a majority the water for Diversion 73 “consists principally of water discharged into Hooten Gulch through the South Cow Creek tailrace”:

Diversion 73 is the Abbott Ditch from the south side of the east channel of South Cow Creek within SW$\frac{1}{4}$ of SW$\frac{1}{4}$ of Section 6, T31N, R1W.

A concrete and flashboard dam 6 feet high and 30 feet long diverts the water into a ditch 7 feet wide and 2 feet deep. Water available for diversion consists principally of water discharged into Hooten Gulch through the South Cow Creek Powerhouse tailrace, although a small amount is also contributed by the eastern channel of South Cow Creek and return flow from lands irrigated by the Wagoner Ditch (Diversion 72).

Appendix 5

1969 Adjudication – includes tailrace water as “natural flow”:

5. Natural Flow

The term "natural flow" means such flow as will occur at any point in a stream from the runoff of the watershed which it drains, from springs and seepage which naturally contribute to the stream, and from waste and return flow from dams, conduits, and irrigated lands, as distinguished from water released directly from storage for rediversion and use, or water imported from another watershed which is released directly to the natural channel for conveyance to place of beneficial use.

Appendix 6

Technical Solution

April 2013

Technical Solution to Resolve Tetrick Ranch / ADU Loss of Water from Decommissioning Project No. 606

Problem:

The proposed PG&E and FERC solution described as the preferred alternative in the Final Environmental Impact Statement (FEIS) for the decommissioning of FERC P-606 includes removing the Cow Creek powerhouse and eliminating the facilities that deliver the associated tailrace water that currently feeds Hooten Gulch. However this water supplies the Tetrick Ranch and Abbott Irrigation Ditch. Removal of the water from the tailrace also degrades the wetland-aquatic-riparian habitat along 0.5 miles of Hooten Gulch, which is known to support listed steelhead during portions of the year. The Tetrick Ranch and Abbott Ditch Users (ADU) as landowners and water rights holders have developed a solution to the problems associated with loss of habitat for listed anadromous salmonids and the FEIS failure to maintain water delivery to the ADU.

Solution:

The proposed project would re-establish approximately 1,200 feet of the historic east channel of South Cow Creek so that it once again flows into Hooten Gulch and thus continues to provide water to the historic and current Abbott Diversion. This solution also maintains flow in an additional 1,200 feet (approximately) of Hooten Gulch downstream of the confluence of the restored east channel that would be lost under the preferred alternative in the FEIS.

Project Elements would include:

- Construct a rock weir to deliver water from the existing east channel of South Cow Creek into a restored historic channel that contained flows prior to channelization of the main stem of South Cow Creek in the 1940's.
- The project would restore the aquatic and riparian habitat and adjacent floodplain within the historic channel (1,200 feet) such that fish habitat value is optimized and wetland habitat would be created.

- The boulder weir would be designed to allow fish passage and feature a failsafe diversion that allowed peak flows to continue to the main stem of South Cow Creek should they exceed the capacity of the restored channel.
- The newly restored channel banks would be stabilized with on-site rock, planted with native riparian vegetation and fenced to exclude livestock as necessary.
- The Project would maintain existing aquatic habitat in the lower quarter mile of Hooten Gulch by reestablishing historic flow from the restored east channel of South Cow Creek (this portion of Hooten Gulch would be dried up following the planned removal of the P-606 facilities).
- Reestablishing this flow in Hooten Gulch via restoration of the historic east channel minimizes changes to the existing water delivery pattern and maintains the Abbott Ditch Diversion 73 in its original and current location as corrected by the Shasta County Superior Court, January 30, 2012, per case number **68-38577.**
- The project would install a fish screen and ladder at the currently unscreened and un-laddered Hooten Gulch diversion dam (Diversion 73).
- Because the restored east channel will be designed as optimum fish habitat, screens are not needed at the inflow and outflow of the channel and fish will be encouraged rather that prevented from using this habitat.
- Adequate flow will be maintained in the restored channel because PG&E bypasses will be restored causing increased year-round flow in South Cow Creek.

Project Components:

- Fish screen and ladder at the Abbott Diversion
- Restoration and maintenance of up to 2,500 linear feet of salmonid habitat with a 1-3% gradient, substrate optimized for spawning, and stable, vegetated banks.
- Create and maintain up to 3 - 5 acres additional acres of wetlands
- A fish passable and failsafe rock weir design at the inflow of the re-established channel
- Fencing to eliminate bank damage from livestock
- Additional shade in the restored areas

Project Benefits:

- The FERC and CEQA process for the South Cow Creek portion of the PG&E proposed P-66 decommissioning can be solved with this project's approval.
- The historic and current diversion point of the Abbott Ditch remains unchanged.
- Project work could begin during periods of low flow as early as August 2014.
- No new screened diversion will need to be constructed in the main stem of South Cow Creek which is prone to flooding.

- No new roads or power lines will be required to operate a mechanical screen.
- Land owner cooperation.
- Additional 2,500 linear feet of ideal gradient for fish habitat.
- Maintains 1,200 linear feet of Hooten Gulch or fish and aquatic habitat.

Project Process:

- Buy-in of the stakeholders
- Settlement with PG&E
- Buy-in of resource agencies
- Project design benefits listed salmonids
- 1600 permit
- CEQA

Project Timeline:

- Stakeholder review of proposed project
- Settlement conference

Existing Channel

Restored East Channel

VESTRA

SOURCE: BING 2011

0 175 350 700 Feet

FIGURE 1
TETRICK RANCH TECHNICAL SOLUTION
RESTORED EAST CHANNEL
TETRICK RANCH
SHASTA COUNTY, CALIFORNIA

P:\GIS\70935\70935_ProposedChannel.mxd

April 20, 2013

Kilarc-Cow Creek Hydroelectric Project License Surrender (Proposed Project)

Comments from Coalition

1. As interveners in the FERC Project 606, the "Project", Shasta County, Evergreen Shasta Power, LLC, the ADU, and the Tetrick Ranch, "the Coalition" hereby requests that all evidence, comments, and alternatives that were presented to FERC by the Coalition in the FEIS proceeding should be included in the CEQA process record. They are relevant to understanding the background of the Coalition, to evaluating the PG&E proposal to surrender its license at the FERC, and to resolve and protect the water rights of the affected parties and the public interest. A list of these documents and their electronic links is attached as "Attachment A" herein. We ask that they be made a part of this proceeding's record. It should also be noted that the alternative proposed by ESP and Shasta County to the FERC is still open for consideration. See Offer of Settlement of Tetrick Ranch, the Abbott Ditch Users, Shasta County, Sierra Pacific Industries, Inc., and Evergreen Shasta Power, LLC under P-606 dated 1/22/2010 elibrary accession number 201200122-5126.

2. The Coalition had multiple non-public meetings with the SWRCB, CDFG, NMFS, CDNR, PG&E, Congressmen, Senators, environmental law firms, and several NGO's to discuss other alternatives and proposals. The Coalition's plan and several options attempted to balance and make tradeoffs among holders of water rights, protection of existing water delivery systems, maintaining renewable energy, provision for local and regional fire suppression, public recreation, and habitat enhancement. The proposals and options included maintaining the Kilarc plant and decommissioning the South Cow plant, land trades, mitigation, and acquisition proceeds to PG&E and other such offers in exchange for maintaining all or part of the Project. PG&E informed us that if the resource agencies would buy in to any of our alternatives, that they would work with us to attempt to settle matters. While the agencies seemed interested at these meetings in the benefits of the mitigation and lands being offered, they made it very clear that they would not accept any alternative that retained hydro power in any part of the Project. Certain key people at the resource agencies stated that they agreed with the merits of our proposed alternatives, but stated that a decision had already been made and that they stood by the 2005 MOU that would decommission the entirety of the FERC Project 606 (Kilarc/South Cow Creek).

3. This pre-decision by the signatories of the MOU without offering the adjoining and affected landowners, water right holders a place at the table, has caused much frustration and dismay throughout the FERC process. It is our hope that the SWRCB will take a broader view of the matters at stake and seriously consider abrogating the 2005 MOU in that the terms of the 2005 MOU are not being met by the proposed License Surrender Application.

4. Over 8 years have gone by since the 2005 MOU and there are still no details and nothing has materialized. The transcripts of the public meetings held by FERC Staff make it clear that water supply issues and alternatives have not been addressed.

5. The 2005 MOU should have included the landowners and water right holders such as Sierra Pacific Industries, the ADU and the Tetrick Ranch. Any revised MOU or re-established MOU should include the members of this Coalition.

6. The Coalition requests that the SWRCB instruct FERC to add conditions reconsider and redraft the FEIS; and adopt the SWRCB recommendations as a condition.

Tetrick Ranch By: _____ Date April 20, 2012
Steve Tetrick

By: _____ Date April 20, 2012
Bonnie Tetrick

Attachment A

Project 606 FERC filings by Tetrick Ranch, Shasta County, the Abbott Ditch Users, Evergreen Shasta, and Erik Poole.

Title	Date	eLibrary Accession Number
Comments on Final Environmental Impact Statement of Tetrick Ranch under P-606.	10/14/11	20111014-5044
FOIA Responses from NMFS and U.S. Fish & Wildlife Service submitted by Tetrick Ranch and Evergreen Shasta Power, LLC under P-606-027.	11/16/10	20101116-5054
Motion to Correct Erroneous Statements in PG&E "Answer" and Statement of Corrections and Request for Waiver, if Necessary; or in the Alternative, Motion of Tetrick Ranch and Evergreen Shasta Power, LLC to Reject PG&E's "Answer" under P-606-027.	10/12/10	20101012-5319
Comments on DEIS of Erik Poole / ADU under P-606.	8/25/10	20100825-5065
Motion to Intervene of Evergreen Shasta Power, LLC under P-606.	8/25/10	20100825-5089
Comments of Tetrick Ranch and Evergreen Shasta Power, LLC, on Draft Environmental Impact Statement for the Kilarc-Cow Creek Hydroelectric Project License Surrender and Proposed Decommissioning under P-606.	8/25/10	20100825-5114
Shasta County submits request to reschedule the public meeting until mid-August re: the DEIS Kilarc-Cow Creek Project under P-606.	7/6/10	20100706-0023
Shasta County Board of Supervisors' notice of public hearing under P-606.	7/6/10	20100708-0022
Comment of County of Shasta (CA) under P-606.	6/30/10	20100630-5086
Response of Tetrick Ranch under P-606.	6/24/10	20100624-5128
Reply Comments of Evergreen Shasta Power, LLC, Tetrick Ranch, Abbott Ditch Users, Shasta County, and Sierra Pacific Industries, Inc. under P-606.	2/22/10	20100222-5104
Motion to Intervene Out-of-Time of Evergreen Shasta Power, LLC under P-606.	1/22/10	20100122-5121

Title	Date	eLibrary Accession Number
Motion Requesting Settlement Process and for Prompt Action under P-606.	1/22/10	20100122-5124
Offer of Settlement of Tetrick Ranch, the Abbott Ditch Users, Shasta County, Sierra Pacific Industries, Inc., and Evergreen Shasta Power, LLC under P-606.	1/22/10	20100122-5126
Comments of Erik Poole re: Kilarc- Cow Creek License Surrender Proceedings under P-606.	1/19/10	20100119-0033
Follow-Up Comments of Erik Poole to 20091230-5001 under P-606. Letter dated: 1/8/2010.	1/14/10	20100114-5007
Response of Erik Poole under P-606.	12/30/09	20091230-5100
Response of Tetrick Ranch to Comments of California Department of Fish and Game under P-606.	12/30/09	20091230-5103
County of Shasta submits response to the Request for Information from Robert H. Grieve, of the Commission 's Division of Hydropower Administration and Compliance dated 12/16/09 re: Kilarc-Cow Creek Hydroelectric Project under P-606.	12/24/09	20100104-0103
Response to Data Request of Shasta County, California under P-606.	12/16/09	20091216-5110
Comments of Evergreen Shasta Power, LLC re: Kilarc & Cow Creek under P-606.	11/16/09	20091116-0231
Comments of an Individual re: Kilarc- Cow Creek Hydroelectric Project under P-606.	11/16/09	20091116-0237
Comment of Tetrick Ranch, et al. under P-606.	10/30/09	20091030-5063
Comment of Shasta County under P-606.	10/19/09	20091019-5093
Scoping Comments and Information submission of Tetrick Ranch and the Abbott Ditch Users re: Pacific Gas and Electric Co under P-606.	10/16/09	20091016-5088
Answer and Supplemental Comments of Tetrick Ranch and Abbott Ditch Users, etc. under P-606.	8/25/09	20090825-5082

Title	Date	eLibrary Accession Number
Comment of Tetrick Ranch, et al. under P-606.	7/14/09	20090714-5093
Motion to Intervene of Tetrick Ranch under P-606	7/13/09	20090713-5165
Tetrick Ranch requests a meeting with FERC in connection with Pacific Gas and Electric Company's Kilarc-Cow Project under P-606.	6/15/09	20090619-0071
Comments of Steve & Bonnie Tetrick re: Pacific Gas and Electric Company's Kilarc-Cow Creek Project under P-606.	6/12/09	20090612-5142
Comments on P-606 PG&E DLSA submitted by Erik Poole on behalf of the Abbott Ditch Water Users (ADU) under P-606.	11/7/08	20081107-5043
Comments of Mr. and Mrs. Steven Tetrick, owners of the Tetrick Ranch, regarding Pacific Gas and Electric's South Cow Creek power house under P-606.	9/25/07	20071016-0041
Erik Poole requests that he be added to the mailing list for information re: filings and submissions for Pacific Gas and Electric Company's Kilarc-Cow Creek Hydroelectric Project under P-606.	5/29/07	20070601-0026
Comments of Shasta County Department of Resource Management concerning the First Stage Consultation Package dated June, 2002 re: Kilarc-Cow Creek Hydroelectric Project Relicensing under P-606.	7/23/02	20020812-1261
Shasta County submits change of address to update the official mailing list re: Pacific Gas & Electric Co., et al. under P-2667, et al.	5/9/02	20020514-0157

APPENDIX C-2

Written Comments Sub at Meeting

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Northern Region
601 Locust Street, Redding, CA 96001
http://www.dfg.ca.gov

ARNOLD SCHWARZENEGGER, Governor
JOHN McCAMMAN, Acting Director

December 10, 2009

ORIGINAL

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

Comments on Scoping Meeting for Kilarc-Cow Creek Project, Federal Energy Regulatory Commission (FERC) No. 606, Old and South Cow Creeks, Shasta County

Dear Secretary Bose:

The Department of Fish and Game (Department) received the Notice of Scoping Meetings and Environmental Site Review and Soliciting Scoping Comments (Notice) dated September 15, 2009. The Notice identified a Public scoping meeting on October 19, 2009 and an Agency Scoping Meeting on October 22, 2009. Additionally, there were two days of site tours conducted on October 20 and 21, 2009. The Department participated in the October 20, 2009 Kilarc-Cow Creek Tour and attended the Agency Scoping Meeting. The Department respectfully offers the following comments.

Scoping Meeting

At the October 22, 2009, Agency scoping meeting, Department staff stated our official position for the FERC record. We clearly stated the Department was signatory to the Memorandum of Understanding (MOU) for decommissioning of the Kilarc-Cow Creek Project (Project), and the Departments position is support of decommissioning as described in the Surrender Application filed by Pacific Gas and Electric Company (PG&E) to FERC.

Comments have been filed since the October Scoping Meeting that Department staff was unprepared or disinterested in proposed alternatives to PG&E's decommissioning. The Department would like to address those comments. On January 8, 2007, FERC denied Synergic's request for an extension of time based on the fact that Synergic's had not made sufficient progress to justify an extension of time. On May 31, 2007, FERC also denied Davis Hydro, LLC's Notice of Intent to become an applicant for a license. PG&E was then required to prepare and file a

license surrender application by March 26, 2009, in compliance with FERC regulations that provide for the disposition of project facilities (18 CFR §16.25(c)) because no entity had filed a timely application. The purpose of the Scoping Meetings were to discuss the Surrender Application (Project) before FERC. Consequently, the Department's comments were focused on the purpose of the meeting, not the alternatives filed with FERC.

Alternatives

The Department has thoroughly reviewed the Davis Hydro, LLC and the Evergreen Shasta Power, LLC alternatives (Alternatives). After reviewing the Alternatives, the Department is not compelled to change our position and continues to support the proposed PG&E Surrender Application. PG&E would have likely had increased minimum instream flow (MIF) requirements under a new license in order to adequately protect, mitigate for damages to, and enhance the fish and wildlife resources for the Project. These new requirements were part of PG&E's determination that decommissioning was a viable and cost-effective alternative to relicensing. Neither of the proposed Alternatives provide increased flow in the bypass reaches. An economic analysis to demonstrate how either Alternative would be self sustaining under increased flow conditions should be presented.

The Department believes that the Davis Hydro Alternative is experimental, does not use proven fisheries management practices, does not provide adequate scientific literature in support, and does not include adequate MIF below the diversion to protect, and mitigate for damages to the resources. The proposed breeding, return system, and other components of their fish restoration proposal are untested and are unlike anything utilized in successful fish culture or restoration operations, and therefore cannot be supported by the Department as mitigation for the Project.

The Evergreen Shasta Power Alternative proposes improvements in Hooten Gulch for fish passage, spawning and rearing habitat. It also proposes improvements in spawning and rearing habitat in South Cow Creek below the mouth of Hooten Gulch. Hooten Gulch is a seasonal stream and without the augmentation of water from the tailrace of the powerhouse, would be dry part of the year. Hooten Gulch lacks the complexity (i.e. sinuosity, cover, riffle, run, and pool sequences, etc.) found in a perennial stream like South Cow Creek. In order to reasonably discuss the suitability of the bypass reach for anadromous fish production, Department staff,

National Marine Fisheries Service (NMFS) staff, Tetric Ranch owner, and their consultant walked approximately one and a half miles of the lower South Cow Creek on November 16, 2009. After seeing the reach, we believe when the natural hydrograph is returned to South Cow Creek, there will be exceptional habitat for steelhead migration, spawning, and rearing throughout the reach. The Department staff observed the current lack of flow in the bypass reach creates less than ideal habitat conditions and creates potential fish passage issues. Adequate increased flow will remedy these problems.

Cow Creek is an important watershed for the recovery of steelhead (*Oncorhynchus mykiss*). NMFS agrees with this as indicated in their Draft Recovery Plan for the Sacramento River where Cow Creek has been identified as Core 1 for steelhead. The Core 1 populations are those populations identified as a high priority for recovery actions based on a variety of factors. South Cow Creek is specifically unique in the Cow Creek watershed for steelhead recovery because it one of the few tributaries that has optimum migrating, spawning, and rearing habitat throughout the reach and several miles of high quality spawning habitat upstream of the bypass reach. Unlike South Cow Creek, some of the other tributaries in the Cow Creek watershed, such as Clover Creek, have an impassable natural barrier at the same elevations as lower South Cow Creek.

Abbott Ditch

The parties signatory to the MOU recognized as part of the desired conditions, "Other water right holder's rights are preserved." The Department supports a new Abbott Ditch diversion, at the historic location as documented in the 1969 Cow Creek Adjudication (Adjudication). The Adjudication identifies the Abbott Ditch diversion to be located at Sec. 6, T31N, R1W from lower South Cow Creek approximately 3.5 miles downstream of PG&E's current diversion. Department staff has been to the approximate historic diversion location twice this year, and believe it is an appropriate and feasible site for a new diversion.

As part of the National Environmental Policy Act (NEPA) analysis, the Department encourages FERC staff to evaluate the Abbott Ditch diversion, at the historic point of diversion, separate from the Evergreen Shasta Power alternative. The Department is concerned without analyzing these separately; the Abbott Ditch users (ADU) will not get the appropriate mitigation (i.e. a new diversion at the historic location), and may instead have their request rejected as part of a new hydro-project that does not provide adequate increased flow in the current bypass reach. The Department looks forward to working with the ADU and any other parties during the construction and permitting process of a new diversion.

The Department reiterates our support of the decommissioning plan as described in the Surrender Application filed by PG&E to FERC.

Sincerely,

MARK STOPHER
Acting Regional Manager

ec: Messrs. Kenneth Moore, Mike Berry and Matt Myers
Ms. Donna Cobb,
kmoore@dfg.ca.gov; mberry@dfg.ca.gov; mmyers@dfg.ca.gov; and dcobb@dfg.ca.gov

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

October 15, 2009

In response refer to:
FERC P-606:DKW

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

Subject: Scoping Comments of the National Marine Fisheries Service regarding PG&E's Kilarc-Cow Creek Hydroelectric Project, FERC P-606.

Dear Secretary Bose:

NOAA's National Marine Fisheries Service (NMFS) has received a copy of the Federal Energy Regulatory Commission's Notice of Scoping Meetings and Environmental Site Review and Soliciting Scoping Comments, dated September 15, 2009. NMFS offers the following comments in response.

NMFS has previously provided Comments, Recommended Terms and Conditions, and a Motion of Intervention (filed July 7, 2009) in response to the Federal Energy Regulatory Commission's (FERC) Notice of Application Ready for Environmental Analysis. Because our July 7, 2009, filing still accurately reflects our position regarding project decommissioning and license surrender, NMFS requests that FERC refer to those comments during its preparation of the Environmental Assessment.

NMFS remains committed to working cooperatively with Pacific Gas and Electric (PG&E) and other stakeholders in the decommissioning process. Decommissioning, as described in the Final License Surrender Application, remains the most viable alternative for maximizing benefits for anadromous fish. NMFS was one of the signatories of the Early Decommissioning Agreement along with PG&E, the California State Water Resources Control Board, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the National Park Service, Trout Unlimited and Friends of the River - establishing a framework for a decommissioning and restoration scenario for this Project. NMFS remains committed to the principles outlined in the Early Decommissioning Agreement.

If you have any questions regarding these comments, please contact David White at (707) 575-6810.

Sincerely,

Steve Edmondson
Northern California Habitat Supervisor
Habitat Conservation Division

cc: Service List P-606

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Gas and Electric	)	Project No.606
	)	
	)	
Kilarc-Cow Creek Hydroelectric Project	)	
	)	

Certificate of Service

I hereby certify that I have this day caused the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in the proceeding. Dated this 15th day of October, 2009.

David White

David White
National Marine Fisheries Service

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

November 4, 2009

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

Subject: Comments Regarding Scoping Site Visits to Kilarc and South Cow Creeks, October 20 and 21, 2009, FERC P-606.

Dear Secretary Bose:

The National Marine Fisheries Service (NMFS), along with representatives of the Federal Energy Regulatory Commission (FERC), Pacific Gas & Electric (PG&E), other resource agencies, stakeholders and the public, participated in two days of site visits to PG&E's Kilarc and South Cow power facilities and related conveyance structures. The following are NMFS' comments in response to observations made during the site visits which included brief presentations from Tetrick Ranch and Davis Hydro concerning their proposed alternatives.

As described in their presentation, the Tetrick Ranch alternative includes leaving the South Cow Creek Powerhouse in place, increasing the diversion through Hooten Gulch (the powerhouse tailrace), and developing a salmonid restoration area in Hooten Gulch. It includes improving fish ladders and screens at the South Cow Creek diversion and constructing them at the Abbot diversion to facilitate fish passage into Hooten Gulch. Revenues from hydropower generation would ostensibly be used in part to improve habitat and fish passage and to maintain the diversion.

Tetrick Ranch asserted that the alternative will provide environmental benefits such as additional habitat in the conveyance canals, avoiding two construction projects (removing one conveyance canal and constructing another), providing South Cow Creek habitat improvements, and maintaining a source of renewable power. Tetrick Ranch asserted that if the South Cow Creek Powerhouse were removed under a decommissioning scenario, a diversion and conveyance canal would need to be constructed in order to satisfy water rights held by them and the Abbot Ditch Users Association (ADU) downstream, thereby reducing environmental benefits of restoring additional flows to the bypassed reach (Wagoner Canyon).

Tetrick Ranch did not provide a substantial basis that compels NMFS to think that such benefits are likely. Tetrick Ranch does not provide a substantial basis from which to

conclude that establishing habitat in the conveyance canals would be practical or beneficial. Tetrick Ranch does not provide analysis or evidence that their proposed alternative would generate surplus revenues to fund the other habitat improvements, as suggested.

NMFS has previously filed comments regarding the Davis Hydro alternative with the Commission (filed July 7, 2008). During their presentation at the site visit, Davis Hydro did not provide substantial new information regarding their alternative that changes our position as previously stated.

NMFS remains committed to the existing Agreement previously signed along with PG&E, the California State Water Resources Control Board, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the National Park Service, Trout Unlimited and Friends of the River - establishing a framework for a decommissioning and restoration scenario for this Project. This agreement remains the most viable alternative for maximizing benefits for anadromous fish.

If you have any questions regarding these comments, please contact David White at (707) 575-6810.

Sincerely,

Steve Edmondson
Northern California Habitat Supervisor

cc: Service List P-606

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Gas and Electric	)	Project No.606
	)	
	)	
Kilarc-Cow Creek Hydroelectric Project	)	
	)	

Certificate of Service

I hereby certify that I have this day caused the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in the proceeding. Dated this 9th day of November, 2009

David White

David White
National Marine Fisheries Service

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

July 6, 2009

In response refer to:
150304SWR03SR8649

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

Re: Comments, Recommended Terms and Conditions, and Motion to Intervene for the Kilarc-Cow Creek Hydroelectric Project, FERC Project No. P-606

Dear Secretary Bose:

Enclosed are the National Marine Fisheries Service's (NMFS) comments, recommended terms and conditions, and motion of intervention for the Kilarc-Cow Creek Hydroelectric Project (FERC No. P-606). NMFS is providing these comments in response to the Federal Energy Regulatory Commission's May 12, 2009 Notice of Application Ready for Environmental Analysis. Also enclosed is a certificate of service.

NMFS remains committed to working cooperatively with Pacific Gas and Electric (PG&E) and other stakeholders in the decommissioning process. Decommissioning, as described in the Final License Surrender Application, remains the most viable alternative for maximizing benefits for anadromous fish. NMFS was one of the signatories of the Early Decommissioning Agreement along with PG&E, the California State Water Resources Control Board, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the National Park Service, Trout Unlimited and Friends of the River - establishing a framework for a decommissioning and restoration scenario for this Project. NMFS remains committed to the principles outlined in the Early Decommissioning Agreement.

These terms and conditions were developed jointly with and are therefore consistent with the measures proposed by PG&E in their Final License Surrender Application, as well as those concurrently being filed by the U.S. Fish and Wildlife Service, California Department of Fish and Game, and the California State Water Board. The recommendations and terms and conditions herein are provided in accordance with the provisions of the Federal Power Act, 16 U.S.C. § 791 *et seq.*, the Fish and Wildlife Coordination Act, 16 U.S.C. § 661 *et seq.*, the Endangered Species Act, 16 U.S.C. §1531 *et seq.*, NMFS' Tribal Trust responsibilities, the National Environmental Policy Act, 42 U.S.C. § 4321 *et seq.*, and the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 *et seq.*

If you have any questions regarding this document, please contact Mr. David White at (707) 575-6810.

Sincerely,

(for Edmondson)

Steve Edmondson
Northern California Habitat Supervisor

Enclosures

cc: Kilarc-Cow Creek Service List

Comments

I. Background

The Kilarc-Cow Creek Project (Project) is licensed by the Federal Energy Regulatory Commission (FERC or the Commission) as FERC Project No. P-606. The Project, owned and operated by the Pacific Gas and Electric Company (PG&E), is located in Shasta County, California along Old Cow Creek and South Cow Creek. The Project consists of Kilarc Powerhouse and Cow Creek Powerhouse along with related canals, penstocks, forebays and other structures.

Due to the complex and competing resource issues associated with the Project, in early 2004 PG&E decided to explore decommissioning as an alternative to relicensing the Project. PG&E's evaluation showed that the Project would be a high-cost source of energy and would not be competitive with other generation sources. Staff representatives of PG&E, the City of Redding, and the California Energy Commission all recommended against relicensing the Project for economic and environmental reasons. Each of these recommendations has been made part of the FERC record.

In March 2005, after 1½ years of cooperative effort, PG&E, the National Marine Fisheries Service (NMFS), the California Department of Fish and Game (CDFG), the State Water Resources Control Board (SWRCB), the U.S. Fish and Wildlife Service (USFWS), the National Park Service (NPS), and Trout Unlimited and Friends of the River signed an agreement (Agreement) that stated PG&E would not seek a new license. By not filing an application for new license by the statutory deadline of March 27, 2005, the Company lost its incumbent licensee status and its opportunity to relicense the Project. The current FERC license for the Project expired March 27, 2007. Since then, the Project has been operating on annual licenses.

On April 7, 2005, FERC published a notice soliciting applications for the license from potential applicants other than PG&E, providing a 90-day period for filing a notice of intent. Synergies Energy Services, LLC filed a notice of intent to file a license on June 27, 2005, but failed to file an application for license within the time provided by the Commission. Therefore, FERC ordered PG&E to prepare and file a license surrender application in compliance with FERC's rules that provides for the disposition and decommissioning of Project facilities.

On March 12, 2009, PG&E filed the Kilarc-Cow Creek Hydroelectric Project Final License Surrender Application (FLSA).

PG&E has detailed the proposed treatment of facilities in the Decommissioning Plan in the FLSA. In general, treatment of the facilities related to decommissioning is described in the FLSA as follows:

1. Removing diversion dams to allow free passage
2. Dam abutments may be left in place to protect stream banks
3. Powerhouse structures secured and left in place
4. Electrical equipment removed

5. Forebays graded and filled
6. In consultation with affected landowners, canals segments will be left in place, breached or filled. Flumes will be removed.

On May 12, 2009, FERC published a Notice of Application Ready for Environmental Analysis. The notice specified a deadline for filing motions to intervene and protests, recommendations, and preliminary terms and conditions as July 11, 2009. This document is filed in response.

II. Project Description

The existing Kilarc-Cow Creek Hydroelectric Project, owned and operated by PG&E (Licensee), is composed of two developments, including Kilarc and Cow Creek, and has a combined installed capacity of 5 megawatts (MW).

Kilarc Development: The Kilarc development, which diverts water from Old Cow Creek, consists of the following constructed facilities: (1) North Canyon Creek Diversion Dam and Canal; (2) South Canyon Creek Diversion Dam and Canal; (3) Canyon Creek Siphon; (4) Kilarc Main Canal Diversion Dam and Main Canal (including tunnel and elevated flumes; (5) Kilarc Forebay Dam, an earth fill dam, 13-feet high and 43-feet long; (6) a 10-foot wide overflow spillway, 3.0 feet deep and with a rated capacity of 50 cfs; (7) a 48-inch slide gate intake structure with a manual lift, protected by a trash rack over the opening to the penstock; and (8) Kilarc Penstock, a 4,801-feet long buried pipe with a maximum flow capacity of 43 cfs.

Cow Creek Development: The Cow Creek development, which diverts water from South Cow Creek, consists of the following constructed facilities: (1) Mill Creek Diversion Dam and Canal; (2) Mill Creek-South Cow Creek Canal; (3) South Cow Creek Diversion Dam and Main Canal (4) Cow Creek Forebay Dam, an earth fill berm, 16-feet high and 54-feet long; (5) Cow Creek Forebay; (6) a 49.7-foot wide overflow spillway, 1.7 feet deep with a rated capacity of 50 cfs; (7) a 42-inch slide gate intake hydraulically operated and protected by a trash rack over the opening to the penstock; and (8) Cow Creek Penstock, a 4,487-feet long buried pipe.

III. NMFS' Interest in these Proceedings

As pointed out in the FLSA, several special status anadromous species are present in the Project area. Fall and late-fall Chinook salmon in the Project area are candidates for threatened status under the Endangered Species Act (ESA). The Central Valley steelhead Distinct Population Segment (DPS) which is listed as threatened under the ESA, includes all naturally spawned populations of steelhead within the Sacramento and San Joaquin River Basins (71 FR 834). Critical habitat for Central Valley steelhead was designated September 2, 2005, and includes portions of Cow Creek and its tributaries (70 FR 54288). The Central Valley spring-run Chinook salmon Evolutionarily Significant Unit (ESU), which is listed as threatened under the ESA, includes all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries (70 FR 37160). Critical habitat for Central Valley spring-run Chinook salmon was designated on September 2, 2005 (70 FR 52488), but does not include Cow Creek or its tributaries. NMFS has authority to protect and manage these species under the ESA (16 U.S.C. §§ 1531 *et seq.*), Federal Power Act (16 U.S.C. §§ 803 *et seq.*), the Magnuson-Stevens

Fishery Conservation and Management Act (16 U.S.C. §§ 1801 *et seq.*), and other laws. NMFS provides in detail our resources, goals, and objectives for this Project in the following section. For additional details concerning NMFS' interest in these proceedings, please see enclosed Motion to Intervene.

IV. NMFS' Resource Goals and Objectives

A licensee may be surrendered only upon the fulfillment by the licensee of such obligations under the license as the Commission may prescribe and upon the proper disposition of the works as determined by the Commission (18 CRF §6.2). NMFS provides below its resource goals and objectives for the Commission's use in preparation of its environmental assessment of the need for measures required for environmental integrity.

Resource Goals

1. Protect, conserve, enhance, and recover native anadromous salmonids and their habitats by providing access to historic habitats and by restoring fully functioning habitat conditions.

2. Identify and implement measures to protect, mitigate or minimize direct, indirect, and cumulative impacts to, and enhance native anadromous salmonid resources, including related spawning, rearing, and migration habitats and adjoining riparian habitats.

Resource Objectives

1. ***Flows*** - Implement scheduled flows to the benefit of native anadromous salmonids and their habitats. This includes providing a range or schedule of flows necessary to: a) optimize suitable habitat; b) stabilize flows during spawning and incubation of ingravel forms; c) facilitate the efficient migration of spawning adults, safe, and timely emigration of smolts, and movement of rearing juveniles between feeding and sheltering areas; d) ensure redd placement in viable areas; and e) develop channel forming processes, riparian habitat protection, and maintenance movement of forage communities. This also includes impacts of flood control, irrigation, or other project structures or operations that act to displace individuals or their forage or destabilizes, scours, or degrades physical, chemical, or biological quality of habitat.

2. ***Water Quality*** - Modify project structures or operations necessary to mitigate direct, indirect, or cumulative water temperature and water quality impacts associated with project structures and operations, or enhance water temperature and water quality conditions in salmonid habitat.

3. ***Water Availability*** - Coordinate operations with other projects, programs or initiatives, and/or use water transfers, water exchanges, water purchases, or other forms of agreements to maximize potential benefits to anadromous salmonids from limited water supplies.

4. ***Fish Passage*** - Provide access to historic spawning, rearing, migration, and seasonal habitats necessary for salmonids. This includes modifications to project facilities and operations

necessary to ensure: the safe, timely, and efficient passage of upstream migrating adults; the downstream passage of emigrating juveniles; and passage necessary for rearing juveniles to disperse and access habitat necessary for feeding and sheltering.

5. ***Channel Maintenance*** - Implement flow regimes and non-flow related measures necessary to mitigate and minimize direct, indirect and cumulative impacts of project operations on sediment movement and deposition, river geometry, and channel characteristics. This includes impacts on stream geomorphology, capacity, flood plain conductivity, and bank stability. It also includes impacts to the extent, duration, and repetition of high flow events, as well as habitat diversity and complexity.

6. ***Predation*** - Minimize and mitigate the impact of project structures or operations that introduce predators, create suitable habitat for predators, harbor predators, or are conducive to the predation of native anadromous salmonids.

7. ***Riparian Habitat*** - Mitigate or minimize direct, indirect, and cumulative impacts to riparian habitat. Enhance riparian habitat and habitat functions necessary to mitigate and minimize impacts of project facilities and operations.

8. ***Coordination*** - In developing alternatives for relicensing, include a full range of alternatives for modifying project and non-project structures and operations to the benefit of anadromous salmonids and their habitats, while minimizing conflicts with operational requirements and other beneficial uses. This includes developing alternatives for greater coordination with other stakeholders, and water development projects to ensure project structures and operations are consistent with on-going and future restoration efforts, and to potentially enhance these efforts.

V. Projects Impacts on Salmonids

Salmonids require cool, clear, running water to support their freshwater life history stages (Bjornn and Reiser 1991). Incubating salmon eggs require clean gravel substrates. Juvenile habitats typically consist of free-flowing streams providing a complex of alternating shallow, swift riffles, and low-velocity pools with abundant cover in the form of woody debris, boulders, and undercut banks. Dams convert natural stream habitats to artificial pond environments. Habitats for salmonids are adversely affected by project facilities because dams change stream flow patterns, reduce habitat diversity, diminish water quality, and create barriers to the natural instream movements of salmonids. Dams can also enhance habitats for species that prey upon juvenile salmon and steelhead.

Recommended Conditions for Surrender of License

Pursuant to the Commission's regulatory authority under the Federal Power Act (16 U.S.C. 791 *et seq.*) and to carry out the purposes of the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*), NMFS recommends that the following terms and conditions to protect, mitigate damages to, and enhance fish resources be included in the agreement for the Licensee's surrender of the License and in subsequent orders regarding the surrender. These conditions are consistent with the PM&E Measures put forth by PG&E in their Final License Application, and are meant to reinforce our support of the current Decommissioning Plan as the best alternative to restore habitat and instream flows for the benefit of anadromous fish.

The primary goal of these recommendations is to establish safe and effective fish passage, restoration, and habitat conservation for anadromous fish at the Project's facilities consistent with NMFS' resource goals and objectives, described previously in this document. The purpose of NMFS' proposed mitigation measures is to restore and maintain productivity of anadromous fish populations and their habitats affected by Project developments.

NMFS has prepared these preliminary terms and conditions based on current information regarding the proposed decommissioning of the Project. As more detailed plans are developed or new information becomes available, deficiencies may be observed and modifications to protection, mitigation, and enhancement measures may be necessary. NMFS will amend these recommendations as needed to be consistent with finalized design plans and with new information developed as a result of the Commission's environmental review process or to correct deficiencies or problems found during post-licensing monitoring or evaluations. NMFS will work cooperatively with PG&E in developing these modifications.

1. **PM&E Measure GEOL-1: Implement Soil Erosion and Sedimentation Control Best Management Practices**

Recommendation:

The Licensee shall identify and implement Soil Erosion and Sedimentation Control Best Management Practices (BMPs) that address soil erosion impacts that may occur both during and after decommissioning construction work. The Licensee shall adhere to standard erosion control procedures, including applicable measures developed by the U.S. Forest Service (USDA-FS) and published in the Water Quality Management for Forest System Lands in California Best Management Practices (USDA-FS, 2000).

Prior to construction, the Licensee shall identify all natural drainage paths along the canals and tunnel during pre-construction surveys. Slopes prone to instability shall be identified, and site specific BMPs shall be implemented to avoid potential slope erosion and increased sedimentation in streams during and after construction activities. During the construction period, the Licensee shall install BMPs in all areas where soil is disturbed and could result in an increase in sedimentation and/or erosion. The Licensee shall perform inspections after storm events and perform any necessary repairs, replacements and/or addition of BMPs.

At the end of construction, the Licensee shall identify potential future erosion sites and install long-term BMPs. Specific areas to be addressed are listed below:

- After removal of the canals, diversions, and impoundment structures, the Licensee shall implement BMPs such as restoration of natural drainage paths, and recontouring of slopes to match pre-existing slope morphology, as feasible. Revegetation shall be implemented to increase bank stability.

- The Licensee shall implement BMPs to address potential erosion of access roads and staging areas throughout the Kilarc and Cow Creek developments. Artificial swales, culverts, and/or other structures shall be designed to direct runoff away from disturbed areas based on the natural drainage features of the area. For any temporary access roads that are removed, the Licensee shall implement measures in accordance with BMP 2-26 Obliteration or Decommissioning of Roads, as defined in the USDA-FS Water Quality Management for Forest System Lands in California Best Management Practices (USDA-FS, 2000).

Project Impacts:

The removal of structures in the stream banks and creek restoration activities have the potential to result in streambank erosion. In addition, erosion and sedimentation may result from increased use and/or expansion of access roads and construction and/or use of staging areas, which could erode during precipitation events. Erosion and sedimentation may affect anadromous fish by decreasing water quality, burying eggs, or burying available spawning gravel.

2. **PM&E Measure GEOL-2: Implement Stormwater Pollution Prevention Best Management Practices**

Recommendation:

The Licensee shall identify all potential pollutant sources, including sources of sediment (e.g., areas of soil exposed by grading activities, soil/sediment stockpiles) and hazardous pollutants (e.g., from petroleum products leaked by heavy equipment or stored in maintenance areas). Also, the Licensee shall identify any non-storm water discharges and implement BMPs to protect streams from potential pollutants and minimize erosion of topsoil. The Licensee shall include a monitoring and maintenance schedule to ensure BMP effectiveness for sediment control, spill containment, and post-construction measures.

The Licensee shall include a monitoring and reporting program, including pre and post storm inspections, to determine if BMPs are sufficient to protect streams and to identify any areas where stormwater can be exposed to pollutants. The monitoring program will include provisions for sampling and analysis to evaluate whether pollutants that cannot be visually observed are contributing to degradation of water quality.

Project Impacts:

The removal of structures in the stream banks and creek restoration activities have the potential to result in streambank erosion or release of hazardous substances. In addition, erosion and sedimentation may result from increased use and/or expansion of access roads and construction and/or use of staging areas, which could erode during precipitation events. Erosion and sedimentation may affect anadromous fish by decreasing water quality, burying eggs, or burying available spawning gravel. Hazardous substances may harm anadromous fish by decreasing water quality or poisoning them.

Justification:

Implementation of PM&E measures GEOL-1 and GEOL-2 would reduce the potential impacts related to soil erosion and sedimentation and potential release of hazardous chemicals into stormwater runoff.

3. **PM&E Measure GEOL-3: Professional Engineering Design Plans and Specifications Mitigation, and Enhancement Plan**

Recommendation:

The Licensee shall develop detailed design plans and specifications after FERC orders the Project to be decommissioned. These plans shall consider the potential for landslides and shall include provisions to minimize this potential. The Licensee shall prepare engineering plans for new access roads or staging areas to minimize grades and cut and fill volumes, as well as to minimize any potential for landslides as a result of the grading work.

Project Impacts:

Construction activities could cause soil to become unstable resulting in on- or off-site landslides. Landslides could reach streams and cause water quality problems, siltation off gravel beds, and harm to anadromous fish.

Justification:

Implementation of PM&E measure GEOL-3 would reduce the potential for landslides to occur and benefit anadromous fish.

4. **PM&E Measure GEOM-1: Sediment Release Measures**

Recommendation:

Following removal of the South Cow Creek and Kilarc Main Diversion dams, the Licensee shall reshape the downstream face of the sediment wedge left in place at each diversion structure to an appropriate angle of repose. The Licensee shall also form a pilot thalweg to ensure temporary fish passage until the stored sediments have been transported by flow from the

former impoundment sites and to help advance the processes of natural channel formation at the nickpoint created by the dam removal, by performing the following measures:

- Excavate a pilot thalweg through the sediment wedge that connects with the existing thalweg at a nearby upstream point to the thalweg immediately downstream of the dam.

- Shape the pilot thalweg on-site during the dam removal process.

- Dimension the pilot thalweg so that it has at minimum a 6-foot bottom width, which is approximately 20 percent of the 30 foot bankfull channel width downstream from the dam.

- Lay back the side slopes of the pilot thalweg to a natural, stable angle of repose.

- Construct the thalweg channel so that the starting depth at the downstream end of the channel is approximately equivalent to the water surface elevation of the plunge pools immediately downstream from each of the respective dams.

The final design will be based on the best available information at the time prior to implementation, in consultation with NMFS and CDFG. The Licensee shall make adjustments to the thalweg dimensions and elevation if site-specific conditions make it infeasible to construct the pilot channel to the recommended dimensions at either of the dam sites.

The Licensee shall allow the sediments remaining behind the diversions after excavation of the pilot channel to redistribute downstream during natural high flow events.

The Licensee shall place sediments excavated from the South Cow Creek and Kilarc Main Canal diversion impoundments along channel margins for future recruitment during high flow events. The Licensee shall place these native sediments so they do not interfere with riparian vegetation. The Licensee shall not place nonnative angular rock material (which may be found between the bin walls of South Cow Creek Dam) in the stream, but shall dispose of it locally at a suitable site (e.g. as canal fill).

The Licensee shall monitor fish passage conditions along the pilot thalweg channels and for 10 channel widths downstream of the dams for two years following removal. The monitoring program is discussed under PM&E Measure AQUA-5.

Project Impacts:

The release of sediment behind the Kilarc Main Canal and South Cow Creek diversion dams may result in the short-term filling of pools downstream of the dams and the creation of fish passage impediments. The plunge pools located immediately downstream of each of the dams would partially or mostly fill with sediment, and would probably not reform after the dams are removed. Other than these two plunge pools, pools further downstream would also temporarily store sediment, but seasonal high flows are sufficient to maintain these pools over the long-term, so that any sediment deposition would not persist. The downstream face of the sediment wedge

(along the upstream face of the former dam site) could be a temporary impediment to fish passage until there are sufficient high flows to incise into the sediment wedge at the nickpoint created by the dam removal, producing a low-flow channel suitable for passage. Additionally, a highly mobile bed associated with transport of stored sediments could impede fish passage.

Justification:

Implementation of PM&E measure GEOM-1 would reduce the potential for creating fish passage barriers from the face of the sediment wedge and from release of sediments stored behind the dam. Fish passage monitoring (implemented under PM&E Measure AQUA-5) would ensure that dam removal does not result in long term fish passage barriers.

5. PM&E Measure GEOM-2: Bank Erosion Measures

Recommendation:

To minimize potential impacts associated with bank erosion, the Licensee shall conduct the following monitoring and mitigation:

- The Licensee shall conduct a monitoring assessment after removal of the Kilarc Main Canal and South Cow Creek diversion dams. The monitoring shall consist of a visual assessment with photographic documentation of the impounded sediment wedge and streambanks adjoining the perimeter of the former sediment impoundment area. The monitoring shall be conducted after spring runoff, as soon as weather permits access to the sites and flows are low enough that the streambanks can be easily observed. The Licensee shall utilize the visual assessment to identify any areas of active erosion or undercutting, or areas that appear to be susceptible to erosion. The Licensee shall conduct the monitoring assessment for two years post decommissioning.

- If during the monitoring assessment, the Licensee observes significant erosion or bank undercutting, then the Licensee shall implement and install erosion control measures, as feasible, in the channel. The Licensee shall adhere to standard erosion control procedures, including applicable measures developed by the USDA-FS and published in the Water Quality Management for Forest System Lands in California Best Management Practices (USDA-FS, 2000).

During the permitting process, the Licensee will design bank erosion control measures in consultation with CDFG and the Regional Water Quality Control Board (RWQCB). These erosion control measures may include planting vegetation on the exposed banks to help in stabilization, use of geotextile fabric, dormant pole plantings, or other techniques that may be suitable, potentially in combination with rip-rap for stabilization.

PM&E Measure GEOL-1 will also be implemented to address slope stabilization and erosion control protection at the site of infrastructure removal including the dam abutments and diversion canal intakes.

Project Impacts:

There is potential for localized bank erosion to occur following the removal of South Cow Creek and Kilarc Main Canal diversion dams. Erosion may occur at the site where dam abutments or diversion canal intakes were located, or along the stream banks upstream from the respective dam sites in the backwater impoundment area once the sediments have been naturally transported downstream. Following two years of monitoring, PG&E will consult with the resource agencies on the need for any additional monitoring that may be conducted as part of the United States Army Corps of Engineering (USACE) 404 permit.

Justification:

Implementation of PM&E Measures GEOM-2 and GEOL-1 would reduce the potential impact of bank erosion occurring from the removal of the Kilarc Main Canal and South Cow Creek diversion dams. There is no feasible way to determine in advance of dam removal if bank erosion would occur within the former zone of sediment deposition. If monitoring determines bank erosion is occurring, PG&E would implement measures as described above to address erosion. It is expected that any erosion would be minimized as a result of dam removal with implementation of PM&E Measure GEOM-2.

6. PM&E Measure AQUA-1: Isolate Construction Area

Recommendation

To minimize the deconstruction impacts at the five diversion dams and the Kilarc Tailrace (where instream construction would be required), the Licensee shall isolate the construction area from the active stream using coffer dams or other such barriers. The Licensee shall route water around the construction area in pipes or by removing the dam in two or more phases, allowing the flow to move down the other portion of the stream, while the isolated portion of the dam is removed.

7. PM&E Measure AQUA-2: Conduct Fish Rescue in Instream Work Area

Recommendation:

After a work area is isolated, the Licensee shall conduct a fish rescue to remove any fish trapped in the work area. The Licensee shall relocate these fish to an area of suitable habitat within Old Cow Creek or South Cow Creek downstream of the work area.

8. **PM&E Measure AQUA-3: Avoid Sensitive Periods for Steelhead and Chinook Salmon for the Removal of South Cow Creek Diversion Dam**

Recommendation:

The Licensee shall conduct decommissioning work at South Cow Creek Diversion Dam from July through September when adult anadromous salmonids are not present in South Cow Creek.

Project Impacts:

Deconstruction of the Kilarc Main Canal, South Cow Creek, and Mill Creek diversion dams may result in potential lethal effects from shockwaves associated with breaking down the dam structure; potential crushing of aquatic species from operation of heavy equipment in the stream; sedimentation effects associated with dam removal and removal of gates and other headwork structures; and potential fish passage impediments. Deconstruction of North and South Canyon Creek diversion dams may result in all of these impacts, except the potential crushing from heavy equipment in the stream. Finally, the decommissioning of the Kilarc Tailrace could potentially impact aquatic resources. The potential effects of filling the Kilarc Tailrace include the burial of fish by fill materials and sedimentation effects associated with placement of fill material.

Justification:

Implementation of PM&E Measures AQUA-1 through AQUA-3, and GEOL-2 would minimize impacts to fish during deconstruction activities in the Kilarc and Cow Creek developments through a combination of avoidance and monitoring measures.

9. **PM&E Measure AQUA-4: Meet NMFS Passage Guidelines for Anadromous Salmonids**

Recommendation:

If the South Cow Creek Diversion Dam cutoff walls become fish passage barriers, the Licensee shall modify these cutoff walls or implement other appropriate measures to meet NMFS passage guidelines (drop, velocity, depth, roughened channel and other site specific factors) for anadromous salmonids. The Licensee shall consult with NMFS on designs to provide adequate fish passage.

Project Impacts:

After removal of the South Cow Creek Diversion Dam, the remaining cutoff walls may become fish passage barriers due to excessive water velocities, vertical jump heights, or insufficient water depths.

Justification:

Implementation of PM&E Measure AQUA-4 would eliminate any potential passage barrier associated with retention of the cutoff walls below South Cow Creek Diversion Dam.

10. PM&E Measure AQUA-5: Monitor Passage Conditions Following Removal of Kilarc Main Canal and South Cow Creek Diversion Dams

Recommendation:

To assess the efficacy of PM&E Measure GEOM-1 and monitor for any potential development of long-term barriers, the Licensee shall monitor fish passage conditions from upstream of the current sediment accumulations above the dam to a point approximately 10 channel widths downstream of the dam after the diversions are removed.

The Licensee shall conduct monitoring for two years after decommissioning of each diversion dam. In each year of monitoring, the Licensee shall conduct monitoring once after the first major runoff event (as access conditions and staff safety allows) and once again later in the year, during the low-flow season, when the condition of the streambed can be more easily assessed. A biologist with experience in assessing fish passage shall conduct the monitoring. The biologist shall walk the stream segment described above and visually assess for any passage challenges arising from sediment movement (i.e., shallow riffles or bars) and obtain depth and velocity measurements at critical high elevation points. The Licensee shall provide notification to resource agencies prior to monitoring so that agency staff may participate in this survey. The Licensee shall provide a summary of monitoring results at the conclusion of each year of monitoring to FERC, NMFS, CDFG, USFWS, and SWRCB.

If, during the monitoring, a long-term passage impediment is identified as a result of the diversions being removed, the Licensee will consult with CDFG and NMFS and the USACE under the Section 404 permit to determine appropriate measures to remedy the situation.

Project Impacts:

After removal of the Kilarc Main Canal Diversion Dam and South Cow Creek Diversion Dam, the stored sediment behind the dams could continue to act as a barrier to upstream migration, until natural flows removed some portion of the sediment. While this subsequent barrier would be temporary, the duration of time it persisted would depend on the magnitude and duration of high flows during the subsequent winter(s), the size of the stored substrates, and channel geomorphology. This barrier could persist for one or more years. PM&E Measure GEOM-1, which calls for creation of a pilot thalweg channel through the stored sediments, is designed to address this impact. The redistribution of the remaining stored sediment could result in new passage impediments being formed in the vicinity of the former dams. While some short-term impediments (days or weeks) may develop as a result of this sediment movement, long-term barriers (years) are not likely to develop as a result of dam removal.

Justification:

Implementation of the PM&E Measure GEOM-1 would minimize fish passage impacts below the Kilarc Main Canal and South Cow Creek diversion dams by reshaping the downstream face of the sediment wedge left in place to a reasonable angle of repose and excavating a pilot thalweg channel. The monitoring outlined in PM&E Measure AQUA-5 would determine whether any new long-term passage impediments relating to dam removal formed, and, if so, ensure that they are addressed in consultation with CDFG and NMFS.

11. PM&E Measure AQUA-6: Consult with CDFG

Recommendation:

The Licensee shall consult with CDFG on fish management options (including reduced stocking, increased catch limits and other measures) to reduce the number of fish in Kilarc Forebay prior to decommissioning, with the intent of minimizing the number of fish needing to be rescued.

12. PM&E Measure AQUA-7: Conduct Fish Rescue in Canals and Forebays, as Needed

Recommendation:

The Licensee shall conduct fish rescues in the Kilarc Main Canal and Forebay to rescue any fish that remain in these waters during the decommissioning process. These fish shall be relocated to suitable areas to be determined in consultation with CDFG and NMFS. The Licensee shall consult with CDFG and NMFS with regard to the need to conduct fish rescues in South Cow Creek Main Canal and Cow Creek Forebay. If consultation determines that a fish rescue is required for Cow Creek Canal or Forebay, the Licensee shall target salmonids and lamprey for rescue. Non-native fish, such as golden shiner, will not be rescued. The North Canyon Creek and South Canyon Creek diversions shall be decommissioned after diversions cease (these diversions have been out of service for several years), so that the channels are dry and cannot support fish. If the area is not dry, the Licensee shall conduct fish rescues as described for Kilarc Main Canal and relocate the rescued fish to an area to be determined in consultation with CDFG and NMFS.

13. PM&E Measure AQUA-8: Retain Fish Screen in South Cow Creek Main Canal

Recommendation:

The Licensee shall retain the fish screen in South Cow Creek Main Canal until after any fish rescue, if needed (see PM&E Measure AQUA-7), is complete and the canal is closed off so fish can no longer enter the canal. Once the fish rescue has been accomplished, the Licensee shall close off the head of the canal before the screens are removed.

Project Impacts:

Anadromous fish could be stranded in the North and South Canyon Creek canals to the extent that flows in the canals, if any, are cut off. Dewatering Kilarc Main Canal, South Cow Creek Main Canal, and the Mill Creek-South Cow Creek Canal could strand fish in the canals. Decommissioning the Kilarc and Cow Creek forebays could result in fish mortality during dewatering or the filling of the forebay.

Justification:

Implementation of PM&E Measures AQUA-6, AQUA-7, and AQUA-8 would minimize impacts to fish from decommissioning Project canals and forebays through fish rescues. Project impacts in regard to fish disease, predation, and reintroduction need to be better monitored. Corresponding remedial measures need to be undertaken to mitigate for any potential impacts.

14. PM&E Measure AQUA-9: Discontinue Cow Creek Powerhouse Operations in Spring

Recommendation:

The Licensee shall discontinue Cow Creek Powerhouse operations in the spring when natural flow is present upstream of the powerhouse.

15. PM&E Measure AQUA-10: Remove Hooten Gulch Gunite and Implement Bank Stability Measures during the Dry Season

Recommendation:

The Licensee shall remove the gunite in Hooten Gulch and install any replacement bank stabilization measures during the summer when the gulch is dry.

Project Impacts:

Following decommissioning, Hooten Gulch would be returned to its natural ephemeral flow conditions. Cessation of perennial flows could result in fish being stranded or trapped in isolated pools and subsequently dying through predation, dehydration, or poor water quality conditions that develop as these pools dry up. Additionally, the removal of the gunite in Hooten Gulch adjacent to the South Cow Creek Powerhouse and replacement with alternative bank stabilization measures could create potential issues with increased turbidity and contamination from gas, oil and other substances associated with heavy equipment.

Justification:

Implementation of PM&E Measures AQUA-9 and AQUA-10 would minimize potential impacts to aquatic resources, as Hooten Gulch would return more gradually to its natural ephemeral state as natural flows subside. Any fish in Hooten Gulch downstream of the powerhouse would then move downstream with the recession of natural flows in Hooten Gulch and would not be stranded as the result of decommissioning. Conducting channel work after the channel has naturally gone dry would avoid direct impacts to aquatic species as they would not be present at this time.

16. Disposition of Water Rights

Recommendation:

Upon decommissioning, NMFS recommends that the Licensee advise the county Superior court that their non-consumptive water rights, as prescribed in the 1969 Cow Creek Adjudication, have been abandoned in favor of instream flow enhancement, and that all project canals that facilitated the diversion of water have been removed and/or rendered inoperable.

NMFS recommends that FERC provide a reopener of the surrender order, to go into effect if the assumptions upon which NMFS relied on in allowing the abandonment rather than transfer of the water rights to a resource agency, turn out to be mistaken. These assumptions are described more fully below.

Justification:

In the March 2005 Agreement (see previous Background section), the water rights associated with the Project were to be transferred to a resource agency or other entity for the protection, preservation and/or enhancement of aquatic resources after the completion of the decommissioning activities. However, the Cow Creek stream system was adjudicated in 1969 (Decree of the Superior Court for Shasta County No. 38577) which requires the court to approve changes to the water rights associated with the Project. CDFG has "declined to accept transfer" due to the potential for a lengthy process needed to facilitate the transfer. PG&E stated in the LSA that they will abandon the water rights by ceasing diversions after decommissioning.

It is our understanding that because the area is adjudicated, and the water rights are non-consumptive, there should not be an opportunity for a third party to come in and claim the abandoned water, which according to the March 2005 Agreement would be utilized for fish and wildlife resources. NMFS continues to support the goal envisioned in the Decommissioning Agreement that PG&E's water rights be used to protect, preserve and/or enhance aquatic resources.

Advising the county Superior court of the abandonment of their non-consumptive water rights will assist in accounting and record keeping of water rights.

Recommended Actions for Decommissioning of Project Works

Kilarc Development

1. North Canyon Creek Diversion and Canal

Recommendation

Diversion Dam

- Remove wooden stream bank supports and bottom boards.

- The small wooden structure will remain in place to minimize site disturbance caused by difficult access.

Canal

- Two options are proposed for decommissioning the earthen canal depending on accessibility to the canal section: abandoning in-place (for limited accessibility) and filling the canal (for full accessibility). If abandoned in-place, the canal will be strategically breached to address storm runoff and avoid potential erosion/sediment issues. Filling the canal will entail excavating one-half of the height of the canal berm and using the excavated materials as fill (the canal is constructed of native material and has no lining). If filled, the surface will be graded to drain rainwater and snowmelt; erosion control measures will be implemented consistent with Best Management Practices (BMPs) and Project-specific PM&E measures should be implemented.

2. South Canyon Creek Diversion and Canal

Recommendation

Diversion Dam

- Remove diversion walls to natural ground or streambed level, gate, operating mechanism, and all segments. Concrete will be removed from site with mechanical components.

Flume

- Remove wooden and corrugated metal pipe structures. Concrete foundations will be left in place.

Canal

- Two options are proposed for decommissioning the earthen canal depending on accessibility to the canal section: abandoning in-place (for limited accessibility) and filling the canal by excavating one-half of the height of the canal berm and using the excavated materials as fill (for full accessibility; the canal is constructed of native material and has no lining). If abandoned in-place, the canal will be strategically breached to address storm runoff and avoid potential erosion/sediment issues. If filled, the surface will be graded to drain rainwater and appropriate erosion controls will be implemented. The concrete spillway and concrete gate slots will be removed and backfilled with excavated berm material.

Siphon

- Remove trash bars and concrete wing walls, collapse a rubble wall and bury it with excavated berm material.

- Remove all above-grade pipe and install concrete block wall at the vertical intake. Buried portions of the siphon will be capped and abandoned in place.

3. Kilarc Diversion Dam

Recommendation

- Remove the structures, guide walls, diversion gate and frame, gate operator, and debris from the site.

- A temporary cofferdam or diversion may be required.

- The diversion dam appears to be constructed on natural bedrock. The concrete portion that was added to construct the diversion will be removed.

4. Kilarc Main Canal

Recommendation

- For the earthen canal sections, two options are proposed for decommissioning depending on accessibility to the canal section: abandoning in-place (for limited accessibility) and filling the canal (for full accessibility). A canal will be filled by excavating one-half of the height of the canal berm and using the excavated materials as fill (the canal is constructed of native material and has no lining). If filled, the surface will be graded to drain rainwater and appropriate erosion controls will be implemented. If abandoned in-place, the canal will be strategically breached to address storm runoff and avoid potential erosion/sediment issues.

- For the concrete and shotcrete-lined canal sections, several options are available for decommissioning depending on accessibility to the canal section. If the canal is easily accessible for heavy equipment, the concrete walls and bottom will be broken up and pushed into the canal bottom. If there is little to no accessibility for heavy equipment to the canal section, the canal will be abandoned in-place. Abandoned-in-place sections will be strategically breached to address storm runoff and avoid potential erosion/sediment issues. Concrete sections with the downhill wall exposed may be hand cut, broken along the bottom edge, and pushed into the canal bottom. If excess native material is readily available, the canal will be filled with excavated berm material and graded, and erosion control measures will be implemented. Final disposition of sections not accessible by construction equipment will be determined on a case-by-case basis and the practicality of hand removal options will be considered.

- The flumes will be removed to their foundations, anchor bolts will be saw cut or ground flush, and foundation piers will be left in place.

- Mechanical equipment, a shed, and concrete sections, including foundations to grade, will be removed, grading will be conducted, and rip-rap will be installed, if required.

- Broken concrete will be used for rip-rap, if required, where removal of a structure damages the slope.

- Gates, frames, gate operators, support structures, the catwalk, guidewalls and any foundations to grade will be removed.

- The overflow spillway will be demolished, filled and graded, and appropriate erosion control measures will be implemented.

- The thermal electric generator and building will be removed along with slab or foundation concrete.

5. Kilarc Forebay

Recommendation

- The intake trash rake, telemetry, and electrical equipment will be removed; fencing and structures will be demolished and removed, along with any concrete foundations to grade; and the culvert will be backfilled when the canal is backfilled.

- The forebay will be filled with excavated bank material, graded for drainage, and seeded with appropriate seed mix; appropriate erosion control measures will be implemented in accordance with proposed PM&E measures.

- The overflow spillway will be demolished, filled, and graded (as part of reservoir fill work), and appropriate erosion control measures will be implemented.

- The bridge and platform will be disassembled and removed, control equipment will be removed, and the shaft will be cut off at the bottom of the reservoir. Concrete supports, if any, will be left in the reservoir bottom and covered by fill during reservoir backfilling operations.

- The picnic tables and site furnishings will be removed. The restroom buildings and slabs will be demolished and removed. The toilet vaults will be pumped, backfilled and abandoned in-place.

6. Kilarc Penstock – Penstock

Recommendation

- The upper and lower ends of the penstock will be plugged with concrete and graded to cover the exposed section at the surge tower. Because removal of the buried pipe will cause significant site disturbance at a significant cost, the buried pipe will be left in place.

- The surge tower will be cut off and removed; the opening will be covered with a welded steel plate.

7. Kilarc Powerhouse and Switchyard

Recommendation

- Turbines, generators and all associated electrical and mechanical equipment associated with the powerhouse will be removed and the structure will be abandoned in place.

- Turbine pits (located inside the Powerhouse structure) will be filled with mass concrete or other suitable fill material and capped with concrete to be flush with the surrounding floor.

- All exterior openings in the Powerhouse structure will be sealed in a manner dependent on their use. Draft tube openings will be sealed with formed concrete plugs; penetrations for electrical connections will be sealed with foam type filler or plywood, depending on size; windows will be left in place but covered with plywood cut to match the opening and doors and windows will be closed and locked but not permanently sealed. The tailrace will be backfilled to the confluence using local earth materials.

- Powerhouse structure will be secured (in accordance with PM&E measures) and left in place during decommissioning; an option for future reuse of the structure will be preserved. The switchyard will be left in place as it is an integral part of the PG&E inter-connected transmission system.

8. Mill Creek Diversion – Dam and Canal Intake

Recommendation

- Abandon the canal and fill with excavated dam material, where reasonably feasible, to minimize environmental disturbance of the berm. This is the preferred alternative of the private landowner on whose property the canal is located. Strategic breaching will also be implemented to prevent retention of runoff water, where necessary.

9. South Cow Creek Diversion Dam and Appurtenant Structures

Recommendation

- Dam removal will include removing the concrete cap, removing fill, and removing the bin walls and interior baffles.

- A temporary cofferdam/diversion will likely be required.

- Some abutments and foundation structures, connecting to the steep side slopes and below the channel bed, will be left in place to minimize potential future erosion and disturbance to the slopes. These structures include the two parallel cutoff walls beneath the bin-wall dam structure and the retaining walls on both slopes. Retention of the cutoff walls will provide bed grade control after the dam is removed. A portion of the north bank retaining wall will be left in place, with fill behind the wall graded to match the existing slope. Retention of the wall will provide erosion protection and address bank stability. A portion of the south bank retaining wall adjacent to the intake will also be left in place to avoid destabilizing the steep bank behind and above it. All other structures and equipment will be removed (e.g., electrical, mechanical devices, gates, screens, exposed rebar, rakes, metal cables, crib dam sheet metal panels, tie bars and drainage pipes). Where feasible, it is acceptable to the private landowner if structures at or below ground level are left in place so long as they are graded over with sediment fill or fill from elsewhere.

- Equipment access will minimize environmental damage to the surrounding vicinity. More detail about road access to these structures is provided in Section 2.4.

- The broken concrete from the dam and ancillary structure removal will be placed in the first reaches of the main canal and graded over with fill from the canal banks or with sediment from behind the dam if the sediment is not needed or not suitable for stream restoration.

- To allow recruitment of native material stored behind the dam to downstream reaches, sediment from behind the dam, composed mostly of gravel and cobble, will be distributed along stream margins, taking care to not affect riparian vegetation.

- Nonnative material, which may be removed from between the bin walls, may be used for backfill in canals. This nonnative material will not be placed in or along the margins of the stream.

10. South Cow Creek Canal and Tunnel

Recommendation

- Abandoning the canals in place, with strategic breaching, is the preferred alternative of the private landowners on whose property the canal is located. For the earthen section of the canal, strategic breaching will address storm runoff and avoid potential erosion/sediment issues. The short, shotcrete-lined canal segment, from the diversion structure to the bridge, will have the shotcrete removed and placed in the bottom of the canal. The canal segment will then be filled with material from the berm, burying the shotcrete.

- The Cross-over flume is a metal structure that can be easily removed. Given the minimal amount of runoff from uphill sources and the difficulty of maintaining the structure after abandonment, the recommendation is to remove the flume. Removal can be done primarily through unbolting or cutting metal connections. Foundations will be left in place to avoid disturbance to the steep slopes.

- The Cat Bridge is a substantial structure tied into the walls of the canal. Given the landowners' preference for abandoning the canal in place, the bridge will also be abandoned to allow access across the dry canal.

- Tunnel work includes plugging the upstream and downstream ends of the tunnel with concrete and abandoning the tunnel in place.

- Spillways (2 or 3) will be modified such that spill height elevation is the same as the canal bottom.

11. Cow Creek Forebay

Recommendation

- The Cow Creek Forebay will be dewatered and all removal work will occur when the forebay is dry.

- Work will involve removing the forebay by backfilling with the adjacent berm material, grading, and reseeding.

- Removal of the outlet structure will consist of removing structural steel elements, cutting off corrugated metal pipe flush with the bottom, breaking up concrete, and backfilling.

- Broken concrete will be placed in the forebay and covered with earth.

- The mechanical trash rake will be removed and the concrete walls will be demolished and removed.

- Below-grade structures will be left in place and graded over.

- The spillway will be abandoned in place to minimize disturbance to the slope that will be caused by its removal.

12. Cow Creek Penstock

Recommendation

- Upstream and downstream ends of the penstock will be plugged with an engineered concrete block.

- Because removing the remaining buried penstock will cause a significant environmental disturbance and be extremely costly, the buried penstock will be left in place.

13. Cow Creek – Powerhouse and Switchyard

Recommendation

- Powerhouse work will include removing turbines, generators, and all associated electrical and mechanical equipment, and abandoning the structure in place.

- Existing concrete will be left in place.

- Turbine pits (located inside the Powerhouse structure) will be filled with mass concrete or other suitable fill material and capped with concrete to be flush with the surrounding floor.

- The powerhouse structure will be secured (in accordance with PM&E measures) and left in place during decommissioning; an option for future reuse of the structure will be preserved.

- Switchyard work includes removing equipment and structures.

- Hooten Gulch will have the shotcrete armor removed for burial in the tailrace to allow a more natural stream bed for fish passage. Replacement bank stabilization measures will be installed.

14. Access Roads for Project

Recommendation

- For the disposition of existing Project roads, PG&E will leave them in-place per landowner requests, scarify and seed the surfaces of any roads to be rehabilitated, and erect barriers or obstacles to limit future access.

- If any new access roads are needed for decommissioning for Project facilities, PG&E will follow the protocols discussed in the applicable proposed PM&E measures to reduce or avoid impacts to environmental and cultural resources.

- For the disposition of any new access roads that are created for decommissioning, PG&E will leave them in-place per landowner requests, scarify and seed the surfaces of any roads to be rehabilitated, and erect barriers or obstacles to limit future access.

Bjornn, T.C., and D.W. Reiser (1991). Habitat requirements of salmonids in streams. Chapter 4 in Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats, Meehan, W.R. (ed.) American Fisheries Society Special Publication 19, Bethesda, Maryland. Pp 83-138.

USDA-FS. 2000. Water Quality Management for Forest System Lands in California, Best Management Practices. USDA-FS PSW Region. Available at: http://www.fs.fed.us/r5/publications/water_resources/waterquality/water-best-mgmt.pdf

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Gas and Electric	)	Project No. 606
Kilarc-Cow Creek Hydroelectric Project	)	
	)	

NATIONAL MARINE FISHERIES SERVICE'S MOTION TO INTERVENE

I. Background

On May 12, 2009, the Federal Energy Regulatory Commission issued a "Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Notice of Application Ready for Environmental Analysis, and Soliciting Comments, Recommendations, and Terms and Conditions" in the above-referenced proceeding. The Commission noted July 11, 2009 as the deadline for filing interventions. The National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of Commerce, hereby timely moves for intervention in the above-referenced proceeding pursuant to 18 CFR § 385.214.

Service of process and other communications concerning this proceeding should be made to:

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Phone (707) 575-6810
Fax (707) 578-3435
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Kathryn Kempton
Office of General Counsel
Southwest Regional Office
National Oceanic and Atmospheric Administration
501 W. Ocean Blvd, Suite 4470
Long Beach, CA 90802
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II. The National Marine Fisheries Service's Interest

The National Marine Fisheries Service (NMFS) is a federal agency with jurisdiction over anadromous fish resources affected by the licensing, operation and maintenance of Hydroelectric Projects. See Reorganization Plan No. 4 of 1970, 84 Stat. 2090, as amended; the Federal Power Act (FPA) at 16 U.S.C. §§ 803(j) and 811 et al.; the Fish and Wildlife Coordination Act (FWCA) at 16 U.S.C. §§ 661 and 662; and the Sustainable Fisheries Act, 16 U.S.C. § 1801 et seq. The effects of the projects on passage and flow conditions, habitat, water quality, and other effects on anadromous fish resources directly concern NMFS under the statutory authorities listed above.

NMFS also has jurisdiction over anadromous species affected by the Project under the Endangered Species Act, (ESA), 16 U.S.C. § 1531 et seq. The Central Valley steelhead Distinct Population Segment (DPS) which is listed as threatened under the ESA, includes all naturally spawned populations of steelhead within the Sacramento and San Joaquin River Basins (71 FR 834). Critical habitat for Central Valley steelhead was designated September 2, 2005, and includes portions of Cow Creek and its tributaries (70 FR 54288). The Central Valley spring-run Chinook salmon Evolutionarily Significant Unit (ESU), which is listed as threatened under the ESA, includes all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries (70 FR 37160). Critical habitat for Central Valley spring-run Chinook salmon was designated on September 2, 2005 (70 FR 52488), but does not include Cow Creek or its tributaries. In addition, the Project substantially influences seasonal and daily flows, important water quality parameters (e.g., temperature, dissolved oxygen, and total dissolved gas), and riparian areas in historic and current habitat for salmonids.

Pursuant to these authorities, NMFS has a federal statutory responsibility for protection, mitigation and enhancement of anadromous fish resources that may be directly affected by the results of the complaint proceeding. The FPA and FWCA confer upon NMFS a specific right to participate in this proceeding. The interests of NMFS as a regulatory agency with jurisdictional

responsibility for the protection, mitigation and enhancement of affected anadromous fish resources are not adequately represented by any other party in this proceeding. By carrying out its statutory responsibilities under the FPA, FWCA and other authorities cited above, NMFS acts in the public interest. In addition, NMFS is obligated to satisfy its tribal trust responsibilities in the exercise of its statutory authorities affecting tribal interests and tribal treaty obligations.

III. Conclusion

For the above-stated reasons, NMFS respectfully requests that its motion to intervene in this proceeding be granted.

DATED July 6, 2009, on behalf of the National Marine Fisheries Service.

Respectfully submitted,

David White

David White
Santa Rosa Office
National Oceanic and Atmospheric
Administration

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Gas and Electric	)	Project No. 606
Kilarc-Cow Creek Hydroelectric Project	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in the proceeding.

Dated July 6, 2009

David White

David White
National Marine Fisheries Service

198 Sprucemont Place
San Jose , CA. 95139
6 April, 2013

Jeffrey Parks
State Water Resources Control Board
P. O. Box 2000
Sacramento, CA. 95812-2000

Re: Kilarc-Cow Creek {FERC P-606} CEQA

Jeff,

1. Since the submittal of the PG&E LSA, and the FERC NEPA Process that was completed with the issuance of the EIS August 16, 2011, please find per Attachment I {2 pages text / 7 pages diagrams} my description of events & key physical changes that have since occurred in the region of the South Cow Creek Dam structure that resides on our property in Shasta County. In October of 2011, with the support of myself and Peter Hufford whose abutting lands are also involved in the De-Commissioning; P,G & E did a detailed Engineering Survey in the area shown. Therefore they have in their possession the necessary information to develop a set of much more precise diagrams & aerial overlays than shown in the Attachment. For the area involved; P,G & E should document the present state of Recovery today after two years.

2. The Staiger (Albrecht) family's ownership of this property dates to the 1940's and therefore we have first hand knowledge of the power that South Cow can potentially unleash; such as in the 100 year water events forty some years ago. Removing a 100 year structure whose span together with the intake structure that is more than fives the width of the normal stream channel, and whose presence has effected significant geomorphic changes from that before 1907 needs a very clear definition of all the issues involved. Sound, common sense practices with respect to now existing riparian vegetation can be one of the most important factors and allies now and leading up to removal. Therefore, going forward ; and until the dam removal process is actually accomplished, we believe it is appropriate that the CEQA require that one of the Resource Agencies such as the CDF&G {and not just the landowner} should also provide input, review, and approval for any "Vegetation Management" request in the immediate area of the dam. Without that support, our position at this time, is a conservative one, of allowing the natural riparian vegetation in the area beyond the deeded easement boundaries for the canal, and especially P,G E's definition of the FERC boundary, to not be further disturbed.

3. I will document under separate cover my on going concern that the key geomorphic issues for the dam are very loosely and not appropriately defined, or well understood. Although they may be well intended, the LSA PME's trying to address the issue are incomplete. As of now, if these now existing PME's were the sole criteria from which to develop an Engineering plan, there is probably more than 80% chance of a "Low Quality Plan" and very negative outcome. Unfortunately, when working in such areas as a stream bed, things can be a very one way street with it being virtually impossible to reverse or correct the damage. "Mistakes Happen" in all documentation - it is a fact of the real world. However, it is essentially those errors be identified

and well documented on a checklist with a proposed date and a honest commitment to rectify them. In the various Review Processes over the last five years, this has not happened. Failing to follow this most basic of generally accepted process disciplines is how "errors" often get forgotten, overlooked, perpetuated, and swept under the rug.

4. PG& E already has a copy of the Attachment. This document is being furnished to the three Resource Agencies below for the review, and distribution within their organizations. A copy will also eventually make its way to FERC.

Respectfully,

David W. Albrecht

David W. Albrecht
(408) 225-7600
dtalbrecht@sbcglobal.net

1 Atch: 7 Page Doc titled "South Cow Creek {FERC P-606} Diversion Dam Area

cc:

Brenda Oslen : USFWS 10950 Tyler Road , Red Bluff, CA 96080
David White : NOAA 777 Sonoma Ave. # 325 , Santa Rosa, CA. 95404
Matt Myers : CFD&G 601 Locust Street , Redding, CA. 96002

ATTACHMENT I

SOUTH COW CREEK {FERC P-606} DIVERSION DAM AREA
" PG & E CLEAR CUT OPERATION in MARCH 2011"

1. Clear cut apparently occurred 3/21/2001 and appears to have been a unilateral* action initiated by PG&E Northern California Hydro Operations in Shasta County with zero co-ordination with their San Francisco team managing the proposed Decommissioning of P-606. On March 26, by pure happen stance, the impacted landowner (Albrecht's) first observed the "clear-cutting" from a distance on the Mill Creek Canal side. Both Shasta County Hydro Operations, and the PG&E San Francisco team responsible for the License Surrender Application (LSA) were notified. The (LSA), which calls for the scheduled removal of the Diversion structure in 2013, purports to limit riparian vegetation removal in the dam region; with best bank, soil, and erosion practices to be followed.

*"Unilateral" also means no De- Commissioning "Resource Agencies were contacted, nor was the proper landowner. The only notice given was by mail to the adjacent property owner; without PG&E's map included for the proposed work area. Using a multitude of the most basic and primitive first hand standard engineering document review processes; that PG&E GIS generated map appears to be a corrupt and deficient document {See attachment II}. In terms of accuracy, this GIS map information appears to have been never subject to even the most basic review.

2. All mature riparian vegetation (mostly Alder and Willow) was cleared to the ground between the main canal berm all the to the very edge of South Cow Creek (a distance of about 30 ft.); and for an approximate length of 95 ft. (about 0.065 acres). The "clear cut area" is illustrated in a schematic diagram (Figure I, page 3) of this document {softcopy file is Page 3 001.jpg} The "Clear Cut" starts about 80 feet downstream of the Diversion Structure.

a. This "clear cut defoliation" that occurred; lies entirely in the NE¼ of Section 33 that are the private lands of the Albrechts, with approximately 80% of the cut lying beyond the deeded easement for this part of the Project. {The deeded easement width of 37.5 feet from the centerline of the canal is located approximately at the base of the first steep slope of the berm. About 40% of the cut can even be defined as being beyond PG&E's arbitrarily constructed FERC Project boundaries in this region.

b. The "pre-cut" nature of the riparian vegetation lying along South Cow Creek is best understood from a "Google Earth" August 2010 aerial view of this area shown as Figure II on page 4 {Softcopy file is Page 4 001.jpg}. The 1907 deeded easement requirements of 75 feet for the Project bounds in the NE¼ of Section 33 are projected onto this Figure together with the generally accepted definition* of the N¼ point of Section 33. *Generally accepted means per PGE K-2 documents, PG&E LSA documents, USGA maps, projections from century old landowner fences, etc.

c. Figures III A & B { Page 5 001.jpg file} shows a 2009 lands eye view of South Cow Creek looking immediately downstream from points on the dam surface. Figure IV {Softcopy file Page6 001.jpg } shows the old bypass pipe exit in a 2009 picture at the Creek edge. This point is less than a yard upstream of where the 2011 March "clear-cut" was initiated.

d. Figures V-A & V-B {Softcopy file is Page7 001.jpg}show pictures of the "clear-cut" area taken in early April 2011 before the down riparian vegetation was latter "chipped" latter that month. Figure V-A is taken from the main canal berm looking towards the Mill Creek canal side with that side retaining wall and the NE side of the diversion structure in the upper right corner. Figure V-B is the "clear-cut area" taken from the Mill Creek Canal side. Neither the main canal or the berm top shows in this picture as they are at the same elevation as the camera. The wooded area in the background is that on the upslope beyond the far side of the main canal.

e. Figures VI-A & B {Softcopy file is Page 8 001.jpg }give some perspective of the size of riparian vegetation removed near the Creek.

f. Figure VII-A & B {Softcopy file is Page 9 001.jpg } are pictures of the clear cut area taken from the main canal berm side on 7/25/2011 show the berry and vine vegetation that has started to regenerate.

3. As shown in the Figure I schematic; on the main canal side before the 'clear-cut" area begins, there is now left standing downstream of the dam only about a 40 ft long X 40 feet wide stand of alders and willows. Unfortunately it seems it will be necessary to remove at least 50% of this remaining riparian vegetation during the dam removal process in order to remove the old "metal bypass pipe" that is embedded in this region. It would be totally inappropriate to leave such a metal structure in direct proximity of the Creek. Therefore if the dam is actually removed in the near future (< 3years), there effectively will be zero mature vegetation along the Creek bank on the main canal side for a distance of about 175 ft downstream of the dam location.

4. On a visit to PGE Northern California headquarters on 7/27, the departing Hydro operations manager suggested possible artificial "replanting" of the area nearest the Creek bank. This is possibly a good idea, but this landowner wants to wait until end of Spring 2012 to assess what new growth is developing from the old root systems; and assess what Nature can do to self-heal its wound. Unnecessarily working and intruding in the "cut" area could cause even more harm than has already been done in terms of additional damage to still living root systems.

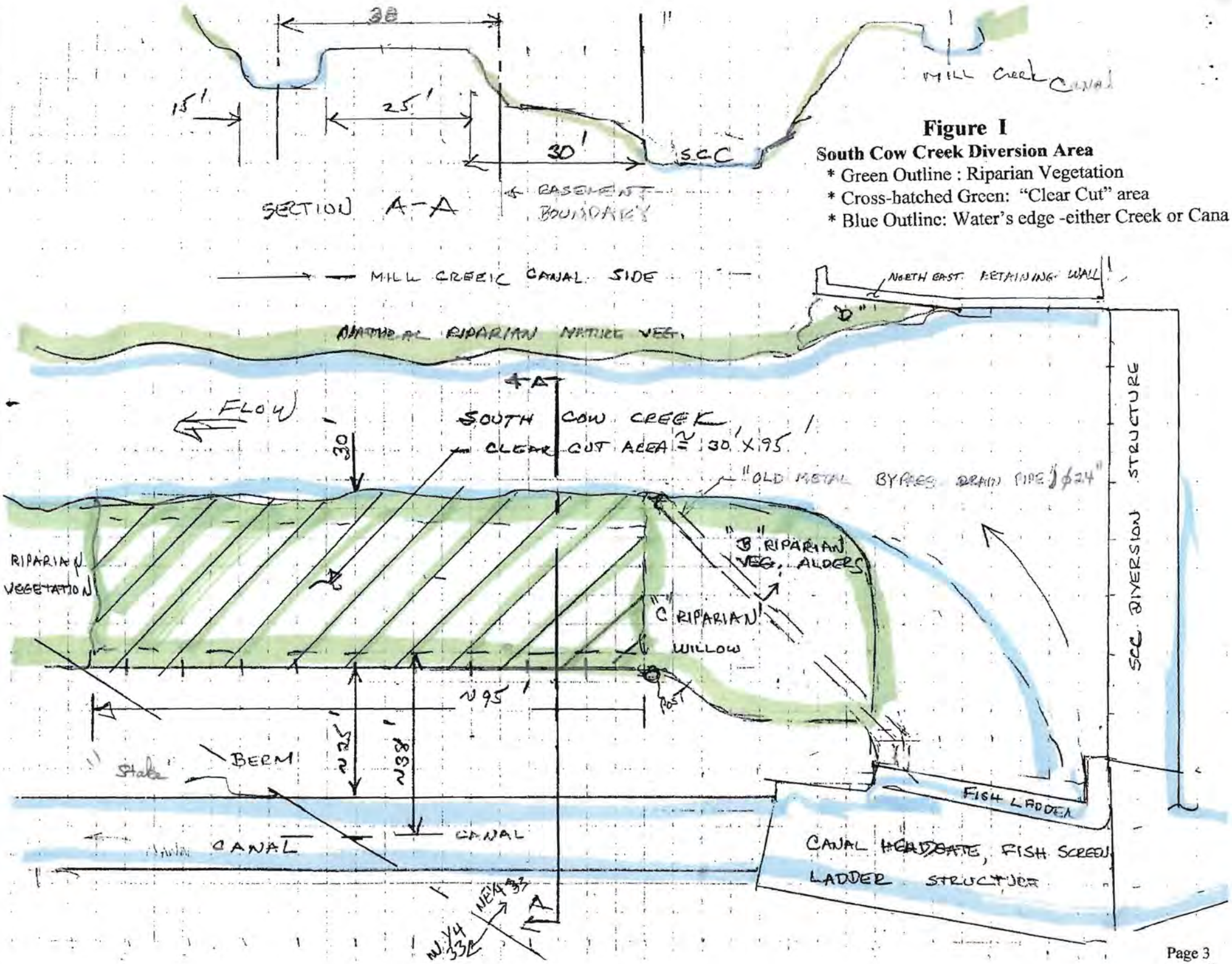

Figure I

South Cow Creek Diversion Area

* Green Outline : Riparian Vegetation
* Cross-hatched Green: "Clear Cut" area
* Blue Outline: Water's edge -either Creek or Cana

Figure II

August 2010 Google Earth View of South Cow Creek Dam Area

* Red overlay lines that bound canal & dam represent 1907 Deeded Easement bounds
  + Similar easement bounds for Mill Creek canal intentionally not shown
* Generally accepted position northern boundary of Section 33 & N¼ point shown at top of photo

Figure II "A"

{ RIPARIAN HABITAT - South Cow Creek Dam Area }

August 1 2010 Google Earth View { Before March 2011 Clear Cut }

July 27 2011 Google Earth View { After March 2011 Clear Cut }

Figure III-A {South Cow Creek immediately downstream of dam - July 2009}

.062 . JPG
7/2009

Figure III-B { South Cow Creek below dam just to left of Figure IV-A - July 2009}
+ Fish ladder just to left of this picture
+ (*) pointer represents corresponding areas between photos A & B

066 . JPG
7/2009

249.JPG
9/2009

Figure IV

{ Exposed exit area of now embedded Old Metal Bypass Drain Pipe - Sept 2009}

Figure V-A { Clear cut area viewed from main canal side looking towards dam}
+ Early April 2011

Figure V-B { Clear cut area viewed from Mill creek canal side looking downstream}
+ Early April 2011

Figure VI-A {Typical Mature Riparian Vegetation cut 3/21 - Picture early April 2011}

SCC5.JPG

Figure VI-B { Typical Mature Riparian Vegetation cut 3/21 - Picture early April 2011}

SCC4.JPG

Figure VII-A { Clear cut area upstream end - Picture 7/25/2011 }

DSC0069.JPG
7/25/2011

Figure VII-B { Clear-cut area downstream end - Picture 7/25/2011}

DCS 0068.JPG
7/25/2011

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April 8, 2011

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 – 1st Street, NE, Mail Code PJ-12.3
Washington, DC 20426

filed electronically

Ref: P-606-027 Kilarc-Cow Creek License Surrender

Re: Request for the Commission to consider restarting the NEPA Process.

Dear Ms. Bose:

The National Marine Fisheries Service (NMFS) submitted a biased and inadequate Biological Opinion (FERC Accession No. 20110302-0001) for the referenced project, as reflected in the Davis Hydro Comment (FERC Accession No. 20110323-5017) thereon. Davis Hydro submitted a Request of PG&E to Supply Temperature Study Information in P-606 (FERC Accession No. 20110323-5097) to which PG&E has replied with a similar bias (FERC Accession No. 20110329-5015) that it does not believe that the requested information should be required to inform the environmental analysis in this proceeding. The attached rationale, provided for your consideration, identifies the handling of the Kilarc temperature issue as illustrative of problematic biases and their consequences on your decision-making that have occurred thus far.

In closing, as we stated in our Comments on the June 2010 Draft Environmental Impact Statement (FERC Accession No. 20100825-5130), we at Davis Hydro came upon this problem/opportunity three years ago. We wish to be the hands to do field work on habitat, and one of the means to support the science, for the restoration of these fish resources. Davis Hydro asks you to start again to help us save the fish, and by doing so save the Community, its needed services, and in passing the accompanying planet.

Respectfully submitted,

Richard D. Ely
Davis Hydro, LLC

Attachment

cc: P-606 Service List

CERTIFICATE OF SERVICE

I hereby certify that I have on this day served the foregoing document by first class mail postage prepaid or email upon each person designated on the official service list compiled by the Secretary of the Commission in this proceeding.

Dated at Fair Oaks, CA this 8th day of April 2011.

Kelly W. Sackheim

Kelly W. Sackheim, Principal
Sackheim Consulting
5096 Cocoa Palm Way
Fair Oaks, CA 95628

Request for Restarting and Deepening the NEPA Process

Importance of Kilarc Temperature Issues

PG&E has identified correctly the key issue of temperature for both Steelhead and salmon, for example in the PG&E Biologic Evaluation (draft) dated August 2009 (PG&E BE) they suggest:

> *Water temperature is a primary limiting factor of natural Chinook salmon production on many Central Valley streams (NMFS, 1999). Chinook are affected by water temperatures in the same manner as steelhead.*
>
> *PG&E BE pp.-3-11*

Removal of the Kilarc Project facilities would probably result in an increase in downstream temperatures where there are known populations of steelhead and Chinook that would be adversely affected, because the water held by the project diversion facilities at a higher elevation for a longer period of time would remain cooler than without the project, and then be further cooled by passing through the turbines. The nearly-inaccessible habitat of the Kilarc bypass region does not presently suffer from adverse temperatures with the project in place, either, as reflected in the PG&E BE, "Water temperature monitoring data collected in May through September 2003 showed that mean daily temperatures were cool, generally remaining below 64°F (18°C), throughout the bypass reach, even during the warmest portion of the year (late July). The cool temperatures provide desirable conditions for rearing salmonids." (*ibid* p. 4-4)

Throughout this work PG&E focuses on the effects of temperature as a key determinant of nearly inaccessible habitat of the Kilarc bypass region and the South Cow (*ibid* pp. 2:29 et seq.; 3:2 - 3:11; 3:15; 4:6; etc), the application of their analysis is applicable to the smaller temperature effects downstream of the Kilarc Project where there are known populations of steelhead and Chinook(*ibid* p.3:8). These known listed species populations will be negatively affected by Kilarc project removal.

PG&E's identification of temperature as a critical issue for steelhead and Chinook was also reflected in FERC's Draft Environmental Impact Statement[1] (DEIS) (p. 36, 69-71, 76, 79-81, 85, 88... 95, 98, etc). An indicative passage is on page 70 of the DEIS, "The return water from the powerhouse tailrace reduces mean stream temperature by up to 4°F relative to the water temperature in the bypassed reach immediately upstream of the Kilarc powerhouse."

PG&E addressed this critical water quality issue in 2003; scientists such as Peter Moyle in 2002 and Lisa Thompson in 2006 (Kilarc.info: KC0260[2]) have focused on temperature as critical

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[1] FERC Accession No. 20100622-4001 available for download from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13826844

[2] *Stream Ecology from a Fish's Perspective: Habitat, Connectivity, and Flow*, available for download from http://kilarc.info/Docs_Maps_Drawings/Documents/KC0260%20Thompson_Lisa_%20July_2007_Restoration_Paper.pdf

habitat determinants for areas below the Kilarc project where there are known populations of steelhead and Chinook. These are cited in Davis Hydro's Kilarc Project Summary (DH-KP[3], Kilarc.info: KC0637) and Davis Hydro's filed Comments on NMFS Biological Opinion (DH-CBO[4], Kilarc.info: KC0647). The State and Federal Agencies – notably NMFS in their 2011 NMFS Public Draft Central Valley Recovery Plan – have focused on temperature as a key stressor and a key action item for these fish. (Refs. cited DH-KP, DH-CBO, DEIS).

The public record includes references to the obvious difference in temperature at the Kilarc Powerhouse project in the summer. For example in September 2007, Mr. and Mrs. Wetmore asked PG&E to again study this issue and filed data and a request for FERC[5] to order PG&E to immediately undertake appropriate environmental studies to identify the effects of the proposed draining and filling of Kilarc reservoir on downstream water temperatures.

Review of Previous Temperature Requests

PG&E Actions

In summary, at Kilarc downstream temperature is an important issue that has been repeatedly identified as important, and then ignored by PG&E. PG&E has a history of ignoring this issue; PG&E:

- Knew of the importance, and completed an extensive study of water temperature at Kilarc (2003)
- Ignored the Wetmores' filed request for a study of issue(2007)
- Ignored that DH identified this issue[6] (2007)
- Identified it as important in their Biological Evaluation (2009)
- Responded negatively to DH even looking at current and existing data. (2011)

PG&E's actions are not in the interest of clarifying the downstream effects of temperature on listed fish and extensive accessible habitat. They show no interest in discovering what is best for the fish. This bias against even looking at the data is underscored by their objections to Davis Hydro's simple request for releasing existing data and existing reports.

NMFS Actions

One might note that the same behavior by NMFS has been observed. The issue of temperature as well as other issues have been cited as important by NMFS' filed comments and studies, yet are scrupulously ignored by NMFS. The following is a list of some of the other issues ignored by NMFS and to a large extent by PG&E:

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[3] FERC Accession No. 20110114-5162 available for download from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13881787

[4] FERC Accession No. 20110323-5017 available for download from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13904291

[5] FERC Accession No. 20071009-0209 available for download at http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13544986

[6] FERC Accession No. 20070731-5001, License Surrender Scoping Comments and Study Request of Davis Hydro LLC under P-606. A Scoping Paper: Suggested Project Surrender Alternatives and Derived Recommended Studies, available for download at http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13526818

- Fires are pervasive in this area and will increase when Kilarc is removed,
- Fishermen will move from the off-channel Kilarc Reservoir downstream to sites on the creek where there are listed species,
- Predators and competition will increase in the bypass region and downstream, and
- Replacement power has to be built having a national, long-term global effect

References: NMFS Biological Opinion, DH-CBO

This bias against considering negative effects in existing data and existing reports on the very fish they are supposedly protecting is unexplained. More important, this agreement inhibits discussion of new ideas as they have evolved. Davis Hydro's Kilarc Project is an example that has improved with comments from many parties, it evolves with ideas from everyone, but detailed dialog with agencies would be useful[7]. These issues have been presented before FERC in this venue, all are important, and perhaps a half-step back is in order. We request the FERC create a forum for their review that would engender a solution that is best for the fish and the community.

FERC

FERC is, by derivation, culpable in ignoring this damage-by-prejudice bias that has perfused verbal and written input from 2005 Agreement participants. These documents and consultation (DEIS 1.4) are used extensively in preparation of the DEIS. Only a simple example dare be presented, as FERC is not the issue nor suggested as damaged-by-prejudice; they have simply been led astray, by the cascade of biased documents from the parties to the agreement.

A simple example: The DEIS Geographic Scope of analysis impact area ends at the confluence of the South Cow and the Old Cow (DEIS 3.2.1. p.36).

There are known populations of steelhead and large habitat areas of both Chinook and steelhead in Kilarc hydropower-affected areas at and just downstream this geographic boundary. These areas have known listed populations. They will be negatively affected. In contrast, listed populations upstream of the Kilarc power plant are non-existent, (DEIS, p. A-6 top) but potentially small numbers of hypothetical fish (of some type) who might benefit are included. When the FERC' DEIS ignores these downstream fish it ignores the following:

- The effects of the increase in downstream flow of predatory and competitive fish as a result of not killing them in the Kilarc facilities.
- The effect of increased temperature from removing the cooling effect of the hydropower
- The deterioration of the water quality and possible decrease in lateral cover from increased in fire prevalence,
- The destruction of the redds in the area due to increased presence of fishermen driven out of the Kilarc reservoir,
- An increase in fishing pressure on listed species in these areas due to displaced fishermen.

[7] Davis Hydro did not hear of the project decommissioning until two years after the March 2005 Agreement. By then, dialog had stopped and only dismissive criticism remained from the 2005 Agreement collective.

A Project's Integral Effect across Geography
These boundaries by a National agency are incomplete because the effect of building replacement power plants will increase acid rains and global warming here, across the nation, and around the world. Consultation with the EPA is required under the Clean Air Act §309, and not yet done here due FERC being led into thinking locally and ignoring destruction of fish globally. FERC defends its action (DEIS p.A-5) by stating that there would be no measurable effect on air quality. They are correct. But that is not the point. Just because we cannot measure the incremental effect on any one water body, or the marginal effect on fish from any one source, does not mean that an action does not have an incremental additive effect on all fish statewide, nationally, and globally -- including many (ESA) and Red Book (Russian) etc. listed species. Let's consider this an opportunity to think and act at least over the domain of a Federal agency.

The Integral of FERC policy across all Projects
Even more important, a National scope policy of ignoring immeasurable individual effects – as FERC does on Page A-5 of its DEIS, when integrated across all FERC reviews of projects, cripples equitable review of renewable energy projects into the future. FERC's policy of ignoring the incremental additive effects from all projects is the engine of global warming. The nexus of effects from ignoring acid rain and global warming is likely destroying more species than any other extant federal policy, and Federal are agencies, charged with preserving endangered species and balancing goals have the opportunity to address it. This can be changed and we implore FERC and NMFS to do that right here, right now. Today, the responsibility of a Federal agency is to think of the aggregate national and global effects of a local action, for it is the sum of these local actions that determines the future.

Conclusion

This is not yet science, for science is the study of the refutable. This is not yet collaboration or discussion, as we, DH, are willing, but unasked, to build a project that will produce far – far more fish than demolition. And this certainly is not independent investigation of what is best for the environment, and/or community. The fixity-of-thought shown in the PG&E response to Davis Hydro's data request and NMFS vacuous Biological Opinion based only on selected data, illustrate that these 2005-Agreeement organizations are as-yet incapable of making a unbiased assessments, supplying data, or conducting any study without prejudice. Therefore, Davis Hydro requests:

1. FERC reject or induce PG&E to withdraw its filing of its Biological Evaluation as a biased damaged-by-prejudice work, and label it as an opinion written to support the 2005 Agreement.

2. FERC remove PG&E from its role in the P-606 docket as preparer of Biological Assessments or Biological Evaluations, as they are clearly damaged-by-prejudice, and have demonstrated this by continuing forcefully to hide data to defend their biased position.

3. FERC request to NMFS similarly withdraw its Biological Opinion as biased, incomplete, and damaged-by-prejudice. It is clearly a biased selective presentation of only data supporting demolition as documented in the Davis Hydro Comment.

4. FERC, who wrote its DEIS based to a great extent on filings and input from these agents recast its existing DEIS as an initial draft EIS and let's have a second draft based on the studies that have yet to be incorporated and studies yet to be done.

5. FERC remove as demonstrated damaged-by-prejudice all signers and their staff who were advisors to the signers of the 2005 agreement from participating directly in a new NEPA process.

6. FERC restart the NEPA process using an unbiased external agency to conduct the process and studies, choosing and evaluating actors and submissions in that new process by the requirements of the DQA, APA, and Presidential Directive cited in our recent Comments on NMFS Biological Opinion.[8]

7. FERC consider alternative approaches of consultation and collaboration under NEPA. Both the Tetrick group and Davis Hydro have asked for consultation on defining processes to lead to helping the fish and the community. These informal requests have been ignored.

8. FERC request PG&E to supply the data and report requested by Davis Hydro in the 3/26/2011 request to FERC as instructed by PG&E. These data are key to understanding temperatures in the Old Cow down across existing listing species habitat. This is a trivial amount of data and it is acceptable in any public electronic format. Davis Hydro will compile and publish it on WWW.Kilarc.info.

9. We request that FERC formally invigorate its administrative procedures under NEPA to comply with its own *Information Quality Guidelines Implementing Section 515* of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (P.L. 106-554) derived from the standards and thrust of the Data Quality Act. We recognize that this may mean a significant change in the way FERC currently involves applicants, agencies, and consultants. It also sets standards for data sourcing, acceptability, and quality.

10. Project Boundaries: FERC expand project impact boundaries to encompass the integral of all possible effects – direct and indirect. The Davis Hydro Alternative, for example through the Kilarc Foundation, will address fish habitat, genetics and epigenetics up and down the Sacramento River. Almost none of these effects will be in the project area. Another example: most of the effect of Kilarc Demolition will be in increased fire, water quality, downstream habitat impacts and national and international effects; not one of which is significantly under the Kilarc project footprint, where by any count, few fish will ever be.

[8] FERC Accession No. 20110323-5017 available for download from http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13904291

In Summary

The 2005 Agreement containing a decision to demolish the Kilarc facility inadvertently codified an espoused mindset of participants in this agreement despite all claims to the contrary. The effect of encapsulating a decision in this early agreement to demolish this facility created a protective barrier of no-conflicting-data-need-be-discussed. This mindset has led to an active damaged-by-prejudice solution that cares little for the Whitmore community; it is worse for the fish on the Kilarc Project site in that overlooks newer ideas, has no positive solution for the South Cow fish or community, and precludes discussion.

It is time to restart. We request the FERC step back - rewind the clock and NEPA process back to the early scoping papers and needed studies as described by various parties in 2007 and let's do the studies and figure out what is best for the community, the fish, and the planet. In return, Davis Hydro is committed to working with any party interested in the fish to create a project that powerfully rebuilds this decimated resource while addressing community needs. We believe that helping the fish, we meet everyone's goals, and that is why we are here.

Davis Hydro, LLC
Richard Ely
Davis, California,
April, 2011

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August 25, 2010

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 – 1st Street, NE, Mail Code PJ-12.3
Washington, DC 20426 *filed electronically*

Re: Comments on the June 2010 Draft Environmental Impact Statement, P-606 License Surrender

Dear Ms. Bose:

Process

We have filed extensive comments on the DEIS on 7/26/2010 (FERC Accession No. 20100726-5012), and wish to have those acknowledged and incorporated. At your second Public Hearing on the DEIS, due to time constraints and previous speakers, we had to rush through our comments. The complete comments, as they would have been presented, are attached as Attachment 1. Please incorporate them into the public record.

Federal Data Quality Act

We again require that all data and studies used in your EIS be presented accordance with the 2002 Federal Data Quality Act (DQA) as well as standard NEPA procedures for supporting studies. Data used shall be presented in the proper context and identify the source along with the supporting data or models so that the public can assess for itself whether there may be some reason to question the objectivity of the sources. Id-DQA.

DQA requires that the substance of information disseminated must be accurate, reliable and unbiased. Id. FERC must identify the sources of the disseminated information, the methods used to produce it, and provide full, accurate, and transparent documentation. 67 F.R. at 8460. NEPA and DQA requires that sound statistical research methods must be used to generate original and supporting data and develop analytical results. Id. at 8459. Data subjected to formal, independent, external peer review, is presumed to be of acceptable objectivity, although such a presumption is rebuttable.

Substance

The remarks below, address only the Kilarc facility and the analysis of its components in this draft of the EIS, for it is clear to us that the Kilarc facility and the South Cow represent completely different issues and opportunities for all concerned – both the community and the fish.

No Significant Anadromy Possible

Bob Carey in his public remarks on 8/17/2010 before the FERC, addressed the CDFG Memorandum introducing the idea that steelhead could pass both Whitmore Falls, and the reference paper cited by CDFG. He carefully read the cited paper and applied it to the situation at the Whitmore Falls. He showed clearly that the probability of significant use of the waters above the Whitmore Falls by rainbow trout for anadromy

is nearly impossible. Attachment 2 to this letter is the key memorandum by CDFG staff. Attachment 3 is the reference paper cited. The conclusion is clear to anyone who reads the reference, and places it in the geographic context so well described by Mr. Carey of fish conditioned by 250 miles swim from the sea.

Upstream passage of fish and the presence of fish in the ten miles between the Whitmore Falls and the Kilarc Project are not negatively impacted by the project. Many people have testified that there are no steelhead and very few trout above Whitmore Falls.

If there is no anadromy many miles below the Kilarc project, what then are we doing even mentioning it in the EIS except to eliminate it from consideration?

Water Temperature and Habitat Destruction

The Kilarc Project lowers water temperature in the Old Cow. How much is to be determined, but it is clearly greater than zero. It is also clear that a major water quality issue on the lower Old Cow and Cow Creek is high temperature caused by many factors that we can address, but helped by the cooling effect of the Kilarc Project. Therefore, on temperature alone, - however small the effect, removing the project will harm, i.e. "Take", steelhead lower in the Creek. If any action resulting from the disposition of the Kilarc facility "Takes" anadromous fish, which are known to exist in the Cow, please include this "Take" in the EIS. It can be estimated from the studies on temperature effects Dr. L. Thompson of UCDavis.

Long Term Habitat Destruction from Fire

Removal of the Kilarc facility will increase the prevalence of fires in the area over the long term. Fires destroys the soils structure and increases rapid erosion into the Creeks we are trying to protect. This marginal increase in fires will statistically decrease habitat long term, and will decrease any fish resources in the area. Well below the Whitmore Falls and in the South Cow this negative environmental impact will result in a "Take" of an endangered species – as they are well documented in the Upper Cow and upper reaches of the South Cow.

Removal of this very popular Kilarc Reservoir and its put-and-take fishing spot will drive fishers downstream to others fishing areas closer to the Main stem of the Sacramento River where they may catch steelhead or potential steelhead. This represents additional fishing pressure take represents a "take". Please include this "Take" in the EIS.

Acid Rains

Removal of this renewable resource will have as a direct consequence the continuation of a natural gas/coal mix in the greater California electric power market. The acid rains, heavy metals, and other contamination will be spread downwind across the Midwest poisoning to a microscopic extent many millions of square miles of habitat of endangered fish. The effects of pH and other contaminants on this species is well known from the literature. This indirect pervasive effect, much like global warming, represents a statistical "Take" of many - fish and other species notably amphibians across our country.

In the EIS please include this "Take"' not only of steelhead by all affected species impacted by changes in acid rains – Frogs and many well documented species of the acid rain-burned Green Mountains of Vermont are typical examples. "Take" of all species should be considered. Ignoring these incremental national and global effects by an agency that espouses Federal environmental domain is disappointing.

Replacement Power Construction
Removal of the Kilarc facility and the construction of any replacement power plants will have direct and indirect consequences throughout our economy. The economic multipliers are reflected with EPA environmental multipliers showing how for any economic activity there is a consequential environmental degradation. In this case, they are twice as large as normal due to both the site demolition and the *de novo* new site construction.

These construction impacts extend throughout our economy and destroy habitat and wildlife just as far. Some of the impact is resident on endangered species and indeed even the potential steelhead across these United States. This "Take" should be considered. These are National/ International effects on all national/international species of concern. In summary, in the EIS, please incorporate the national effects of demolition of green power resources.

Resident Fish and Habitat Diminution
Assuming that water were returned to the Kilarc bypass reach, and assuming that the small trout population there expanded, what would be the consequences? The fish that are present in the Old Cow are derived from fish that have been in this area for over 100 years augmented by the fish from hatcheries. Any anadromous fish would have (by definition) long ago left. This means that these "resident adapted" or "resident mode" or "resident eco-response" or "resident form" (depending on the author) fish will expand and emit juveniles downstream. Way downstream these juveniles will compete in known steelhead areas and put selection pressure on steelhead juveniles competing for the same resources. This competitive pressure with listed steelhead and possibly (to a small extent) juvenile salmon for habitat represents a "Take" of these species. Please include this "Take" in your analysis.

I will stop here. This has all been said before in many earlier filings by ourselves and others. Unfortunately, these filings were neither considered nor yet incorporated into the draft EIS.

The destruction of Green power generation, the fish, our atmosphere, the community, and incrementally the thousands of affected species by Federal Agencies should only be done if there is overwhelming evidence of some higher goal. In the EIS, please make it clear what is this goal.

Alternatives
Davis Hydro has put forth somewhere over 4 evolving Alternatives to demolishing the Kilarc site – all of them can be enabled by willing participants within the FERC process. They started on an early idea that we could use significant parts of the revenues from the Kilarc facility to sponsor resource enhancement. The Davis Hydro Alternatives have evolved. They evolve daily as in any adaptive management plan; we learn as we are going. They evolve because the genetic and epigenetic sciences under us is evolving even faster. It is evolving due to constructive parallel analyses by the newly enlightened fish resource Agencies such as the EIS on the Hatchery operations.

Goals and the Law
When Davis Hydro first came upon this project, it was seen as an opportunity to use the hydropower to help protect or enhance an endangered species.

Davis Hydro will, if allowed, use its resources through and with

the Kilarc Foundation to help the fish whether or not there are any endangered species.

This is important because it is unlikely there is any speciation, or even profound genetic effects at play in the issues before us such as steelhead anadromy. The law, and even its intent, may not be applicable. Science has moved on, especially in the last two years. Epigenetic effects on the surface of a quasi-stable O. *mykiss* genome are the probable cause of most anadromy, eco-responses, and most likely the cause of failure to thrive in the first year from hatcheries. This science is rapidly changing as we understand the modulation of genome expression of phenotypic behaviors from what would be an appropriate allele. Science is now far ahead of the law, and our efforts want to be directed at the fish, not at the law.

Davis Hydro, working with fish geneticists will develop this further in future filings or working papers as the science develops[1]. Suffice it to say, our ability to help these fish appears to have nothing to do with "Endangered Species", little to do with genetics, and nothing to do with the extremely rare fish that might pass up the Whitmore Falls. It does have a great to do with intent and actions.

Our intent from our fist conversation with CDFG is that we will figure our how use this project to help the fish or we will not do the project. We are figuring out what to do as the science changes underneath us. We are learning, and a review of the dates of much of the recent work on, anadromy, steelhead, restoration genetics, and the CDFG hatchery EIS shows, everyone else is also learning at an ever increasing rate. We want to be part of that recovery.

Intent

We do not speak only of promises. We have set up the Kilarc Foundation LLC for the long term handling of resource enhancement and related research projects. We have committed a percentage certain of profits from any operation of the Kilarc facility into that entity. We have stated that frankly we are not interested in discussing the applicability of the Endangered Species Act, or arguing about the rare passage up the Whitmore falls; we are interested in helping the fish, and we are committed to it, and we want to get to work.

Actions

It is not easy to take many actions to date due to lack of control of the site, or cooperation with PG&E or any State or Federal agency. However, the following are underway:

Underway

1. We have set up the Kilarc Foundation and will fund it to the extent possible.

2. We have started by starting a Restoration Genetics program to address the problems identified by the USFWS/CDFG 2010 Hatchery EIS/EIR. This has led to a comprehensive temperature monitoring program of the Old Cow to define the target temperature regime we will be restoring fish into. This temperature, flow and water quality profile definition will be extended into other target Creeks for the benefit of new eco-adapted restoration projects

[1] A brief review of the changing landscape of the understanding of steelhead anadromy can be had by anyone observing recent scientific papers and their dates or by searching on "steelhead epigenetics" in Google, Science Citation Index, or any good biological scientific search engine.

in the future.

3. We have retained a fish genetics consultant and specialists on fish screening.

4. We have studied the whole of the Old Cow and much of the bypass with numerous other biologists looking for the most effective use of this resource and what we can do down on the Cow.

5. We have started a dialog with the Olsen Project downstream asking them to engage with us in studying the Old Cow habitat area, to see if we can enhance it.

6. We have outlined a program of micro-spawning grounds to be seeded with fish or egg-cases to be distributed up and down the Sacramento River. This will restore small local-eco-adapted stocks of fish that do not suffer from the epi-genetic problems endemic in the larger hatcheries.

We have proposed and the Kilarc Foundation may fund carrying out the following activities, if permitted:

Proposed Actions

1. Research
   a. Spawning
      i. In-gravel studies
      ii. Cover, hydraulics, composition
      iii. Predation In and post emersion
   b. Informal Screening
      i. We will test and display numerous screens in the Kilarc Canal showing how fish can be screened by ranchers economically
   c. Herding studies
      i. Fish herding studies started at UC Davis can be continued here, for the benefit of fish resource management everywhere.
   d. Physical Facilities
      i. Wet/ Dry Lab. Research facilities, bunkhouse provided
      ii. Fully instrumented study areas
      iii. On-Canal and Up Old Cow study areas made available

2. Eco-System Restoration
   a. Kilarc Foundation will choose and fund cost effective off-site projects – fences, screens, easements, run-off controls
   b. Seek matching grants to extend screening
   c. Work with WSRCD on joint-funded projects
   d. Possible hands-on maintenance of diversion screens

3. Restoration Genetics
   a. In headrace a prototype of different types of micro spawning beds to be established in targeted tributaries around the upper Sacramento

b. Temperature profiles and spatial studies to match genotype sources to target spawning beds.
c. Support for expansion of State and Federal conservation genetics program.

4. Production
   a. In Kilarc Channel the production of genetically appropriate stocks to restock Cow Creek. This is a small effort.
   b. In other off-site spawning beds, inseminate these beds with appropriate genotype epigenetic encoding to the diverse target micro-ecosystems we are seeding. This is necessary for proliferation. This is expected to be a large effort and very controversial. It will be fraught with failures, difficult to measure success, but essential for rapid restoration of a diverse healthy population in the Sacramento.

5. As Davis Hydro, we will start an education outreach program at the Kilarc Reservoir that will have as elements
   a. Spawning demonstration and explanation
   b. Field run-off pollution explanations and demo
   c. Several different types of economical low-maintenance screens.
   d. Hands-on workshops for showing ranchers how to protect their fish: screening and irrigation plans, drawings, controllers, material lists, subsidies, handholding, encouragement to protect their fish ... we are dead serious.
   e. School-kid level demonstration and explanation: Paper handouts and tours of brood ponds, screens, and
   f. Websites with
      i. All applicable papers and explanatory material on how to save the fish
      ii. Background and details of fish screens
      iii. Programs for conservation easements
      iv. Contacts for getting help

In Conclusion

We ask that the next draft Environmental Impact Statement consider all applicable Alternatives and studies requested two years ago. We ask FERC assist in holding meetings with the resource agencies to see if we can find some common ground. It is extremely disappointing to be dealing through FERC with the very people we want to work with to help the fish. We again request a new direction in the EIS.

We again hold out our hand to the fish Resource Agencies saying we cannot do this alone, please help. Fish restoration requires source stocks, genetic labs, access to spawning grounds, and coordination with other programs. Restoration transplanting, for example, requires a correct balance of appropriate effective population size into any area where there is indigenous ancestral stock. This is fraught with risk, for the bottlenecking of the transplant eliminates many alleles that may have been useful, yet importing too many overwhelms local resistant alleles and leads to out-breeding depression. This is currently as much an art as science. We would like to be useful as we can be in helping larger entities establish a plethora of small targeted inoculants, tailored in their origin to survive the restoration transplant.

In closing, we at Davis Hydro have come upon this problem/opportunity 3 years ago. We wish to be the

field hands and possibly to some extent the science out reach team for the restoration process. Our friends in genetics and soon in epigenetics are not generally in the field with field experience. We see ourselves working in that vane. We see many failures ahead as pointed out by an earlier CDFG review. We are not afraid of failure, for we know that that is a statistical reality in this field. We are relieved that it appears that the steelhead behavior is not a fragile – perhaps not an uncommon allele expression, but an epigenetic imprint that is passed between generations for expression when conditions permit. This is yet to be tested. Given that this is a new field and a very new line of research, we expect and welcome overcoming problems. We have started and we hope to succeed based on our expanded reading in restoration genetics, and applied genomics.

FERC, Davis Hydro asks you to start again to help us save the fish, and by doing so save the Community its needed services and in passing the accompanying planet.

Respectfully submitted,

Richard D. Ely
Davis Hydro, LLC

cc: P-606 Service List

The Kilarc Project

An Anadromous Fish Enhancement Project

For the Old Cow Creek

Utilizing the Resources

of

The Cow Creek Community,

The Kilarc hydropower Facility,

and

The Kilarc Foundation

Draft Summary 1
December, 2010

Compiled by

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Forward

This document contains a summary of the Davis Hydro proposal for work at the Old Cow Creek, where it is the intent of the author, his company, partners, and friends to create a public private partnership to help the fish, support the interests of the local community and to generate green power. From previous discussions with project stakeholders, we have become aware of a persistent series of misconceptions as to Davis Hydro's intent and motivation which have generated undue concern. Hopefully, this work addresses these misconceptions and should provide a fuller description of the structure and content of our proposal as it has grown.

To provide background, while initially I had felt that along with habitat, genetics, would define the major components of our proposed solution to current problems, it has become clear that the new science of Conservation Genetics (Frankham et al 2010) is rapidly being supplemented, if not overtaken, by the even newer and more applicable science of "Conservation Epigenetics" which is growing out of the science of genomics. Epigenetics is a broad term for the study of the mechanisms control of the expression of genes. The "expression" of genes is controlled by the environment of the cell, and that environment is controlled by the environment of the fish. Genes are not generally directly affected by environment. The epigenome, in contrast, regulator of genome expression, is directly and profoundly influenced by the micro and therefore macro environment. If we are to look at how the environment affects our fish, then the functional path through the epigenome must be understood. I envisage that epigenetics will be the handmaiden of habit restoration in this recovery effort.

The degree and depth of needed understanding is unknown. However, at this point, like genetics, it may only be necessary to understand the function of the epigenome, just as it is only necessary to understand the function of the gene to do genetics. A grasp of the underlying chemistry is necessary to make sense of the chemical engine, but a mastery of the chemical structures and pathways is not necessary to "do" genetics. Likewise, in epigenetics, the chemistry provides core mechanism of the science, but understanding that chemistry is not necessary to use epigenetics to our great advantage. How we use and modify natural genetic processes is to be soon eclipsed by epigenetics in life forms as they develop; examples include inhibiting an undesired gene being expressed to the control of genetic diseases in human and animal health. Specifically, we will learn how to harness and modify the "epi" mechanism, as in genetics, to help these fish, and to understand anadromy. Since epigenetics is likely to be the mechanism that controls anadromy and geoadaptation, it's manipulation is central to our efforts.

One can always say, "hands off!", and trust that the fish will figure out how to best come back once the habitat has been improved. The implication being that further interference, after the genetic devastation caused by the hatcheries, is equally unlikely to help. This approach has obvious attractions. It is "risk free" for any practitioner. Do away with man and in a few thousand years, and it is likely, the effects of our pollution, dams, and genetic interference will be hard to discern. Unfortunately, unless we also do away with humans, the "Hands off – let mother nature do it" approach is certain to have profound negative consequences given the deterioration of the current environment. Abandonment of our efforts is likely to prove a very slow and inefficient solution, given the other problems that presently interfere with natural recovery.

If we are serious about stemming the loss of fish stocks, we need to re-establish the genetic viability of both these species and their ecosystem as quickly as possible. Time is of the essence if the current rate of damage to these fish and all of our species - so clearly described by E.O. White - is to be minimized. His admonitions apply to most all species and now, with a clearer lens, to all epigenetic varieties. Minimization of our present and future damage requires us not to reproduce a rough semblance of a past ecosystem, but rather to aim higher and seek to steer the ecosystem to as close to a permanent favorable condition as possible given man's presence.

With the gathering clarity of modern science, we recognize that we are not addressing only a single behavior, or a single species. In fact, in our efforts described here, we are not addressing this fish as a goal, but rather these Fish as a symbol of how their environment could be reborn from what we have now ruined. The decline of these fish and their desired behavior are a visual indicator of our environment's ongoing destruction. It was put directly to me recently by senior FERC staff, "it is not about the fish." It is all about what we are doing to our entire planet. With this reason, this mandate, we address these fish as our environment. Delay is expected and set-backs are required for learning, failure is not an option. In fixing their world, we "fix" the world of many millions of other species that are not so iconic, and have no public voice. Hopefully, what we are doing here will be right and will be duplicated.

I am indebted to a number of colleagues for their help in the preparation of this document; to Kelly Sackheim a partner in KC Hydro and a strong supporter of community collaboration and working within the FERC process from the outset; to the fish biologists who have given me their time and council; and to the students and scientists in epigenetics who have guided my thinking and helped my modulate my angst understanding. I am also grateful to those passionate activists that have championed the interests of the fish and for continually challenging me and propelling me into this fascinating area of research. I hope that this summary will allay their fears and enlist their passion in support of this project. Finally, I am deeply in debt to Roan Harvey for her efforts at my poor English, and constraining my didactic.

This summary, continues to evolve daily as I learn, so I have had to stop and "just get it out" as a snapshot of an education. The first draft was felt by various parties to be too technical and too long, which I fear resulted from my personal exuberance for the possibilities my research has uncovered thus far. This outline of the Kilarc Project is written and circulated to solicit comments and ideas to make it better. It is written in sections, primarily to facilitate updating. Let it be a starting point for a long fight to save what we can. All errors of content and writing style remain mine, and all comments on improvements - no matter how delivered, welcome.

Richard Ely

December 2010
Davis, California

Glossary

An informal explanation of the words used as they pertain to these fish in this summary.

Agencies Refers here to fish resource oriented agencies such as NMFS and CDFG and to a less extent the California State Water Resources Control Board, and the National Fish and Wildlife Service. Also included here, by reference are interveners to the extent they are interested in the fish and their environment.

Allele (allelic) n.a. A particular combination of genes. It is also used to describe the resulting phenotype from those genes.

Anadromy (ous) n.a. Fish that go to the sea and return to fresh water to spawn – often, but not always to their natal site to breed.

Canal The "canal" refers to the existing 3 plus mile headrace for the Kilarc Powerhouse, a component of FERC Project P-606 in 2010.

Conservation Genetics The exercise of genetic management usually of interbreeding multiple populations to produce a desired genetic mix in the offspring.

Conservation Epigenetics The science of creating and management of the epigenome to produce desired phenotypes and behavior in a resulting population.

Epiallele (elic) n.a. A phenotype expressing a specific pattern of characteristics from a given genome.

Epigenome (etic) n.a. The quasi stable (plastic) set of regulators that control gene expression in response to the cellular environment.

Fish Generally in this paper we are referring to Salmonids focusing on rainbow trout

Genetic Pertaining to the patterns of possible phenotypes encoded in genes.

Headrace The headrace is the open canal that connects a diversion to the typically pressurized penstock of a hydroelectric facility.

O. mykiss Often called rainbow trout which can express various environmental coping strategies. One of which is anadromy in which case, if it successfully returns, it is a steelhead.

Phenotype The physical individual organism or organisms that result from a particular combination of genes and epigenomes.

Redd A spawning bed created by the female fish in which she lays her eggs.

Table of Contents

The Kilarc Project

Introduction

This document is a synthesis of the proposed efforts Davis Hydro (DH) and the Kilarc Foundation, (Foundation) will undertake to support fish stocks, primarily of *O mykiss* in the upper Sacramento River. Davis Hydro desires to operate the Kilarc part of the current FERC Project P-606 and will dedicate around 30% of its profits under FERC license condition to the Foundation as an operating income. The Foundation will exist independently of Davis Hydro, but will be given these resources by them, along with other appropriate assistance, to independently progress work on fish resources over the medium and long-term. The Foundation is described in Appendix 1 and the work it might undertake is described in detail in this appended description. Should the future directors of the Foundation wish, DH would supply staff, facilities, and services.

Project Summary

The Kilarc Project will operate the Kilarc part of P-606 as a joint green power plant and a source of funding for the Kilarc Foundation, adhering to FERC procedures and federal and state regulations. Davis Hydro expects to operate the site as it is now, excepting that the Kilarc canal, the headrace, will become a multipurpose headrace, research, public outreach, and education facility. The old transformer building by the powerhouse will become a research field station equipped with bench space, offices, living facilities, and various labs. It is our belief that this proposal delivers considerable and adequate assistance to fish resources while supplying greatly enhanced services to the South Cow community. It will also save PG&E considerable cost. Finally, and importantly, it establishes structures and funding for a long-term positive relationship between the community and fish enhancement activates.

The major component of the Kilarc Project is anadromous fish restoration in the upper Sacramento River and it is our intention and hopefully that of the Foundation will address and consider a broad and evolving list of activates as the funding and science develop. The following section proposes some ideas on the sort of work that may be undertaken as funding and community relations dictate. They are discussed here not in an effort to proscribe a particular off-project direction for the Foundation, but rather to engender discussion and elicit further ideas from stakeholders, and include:

- Habitat enhancements,
- Genetics and epigenetics,
- Geospecific propagation of anadromy, and
- Research.

Habitat Enhancements

Habitat destruction and watershed modifications have been instrumental in decimating the populations, and all parties are in agreement on the need for habitat improvements. With the agreement of stakeholders, either DH or the Foundation could potentially contribute to the following, discussed in no particular order:

1. Water temperature improvement,
2. Lateral tree cover
3. Ranch practices
4. Diversions screens
5. Diversion volume reducing total flow

H-1. Water Temperature

Many of the tributaries to the upper Sacramento River are very warm in the summer in contrast to its central parts. The presence of large upstream dams, diversions, and field run-off create temperature regimes that are a severe challenge to both the salmon and the steelhead (Thompson). This challenging high temperature of some of the tributaries to the Sacramento, is exacerbated by the contrast of an unnatural very cold central stem of the river from Shasta and the warm lower branches of the tributaries such as the Cow.

The Kilarc hydro power plant has a small direct effect of cooling the waters in the Old Cow and the hydropower that can be generated by the continued operation of this facility can be used to generate revenue that the Foundation can use to reduce temperature stress.

H-2. Lateral Tree Cover

Lateral vegetation provides a number of benefits for the tributaries. It provides habitat for insects, shelter for fish from predators, as well as wood, and leaf debris used by primary production within the stream. The overhanging bushes and trees keep the sun off the stream, and cool the air above it. Finally, the longer woody debris generated by this vegetation provides complexity in the environment that is useful in providing a spectrum of micro habitats for both spawning, rearing, and some protection at all stages from predation by birds.

The importance of this cover, food, and material source as well as habitat for insects on which the fish prey cannot be overstated and therefore one of the suggested work areas proposed is a series of joint projects to increase this vegetation including:

- The provision of funding to hand plant brush along the Creeks starting with the Cow and working up and down stream. We would endeavor to involve the local community, for example by creating summer jobs for local young people.
- Similarly, utilizing local labor and youth participation could further the creek-side planting along neighbors ranch waters, while increasing community awareness and connecting young people and their families to the health of the river.

- Using parts of the canal as a nursery to grow large numbers plant seedlings for transplanting to the lower Cow. About 0.5 miles[1] of the canal can be used for this purpose and the roots, especially on the uphill side, may provide habitat to the emergent fry for their first year. This could be coordinated with spawning and research projects and other work going an along the canal.

A key feature of a natural creek is the complexity of the stream, which provides many benefits for fish. We would hope to scale up work with bordering landowners to increase complexity especially along stretches of the Cow and South Cow where it is lacking, having sought streambed permissions and permits from appropriate agencies and solicited the cooperation of local ranches and local people. Davis Hydro could coordinate supply of materials and the Foundation could contract local firms to supply and maintain tree root balls, large boulders, and other stream impediments where appropriate and subject to availability of local materials and permissions.

H-3. Ranch Practices

The Kilarc Foundation will have at least one, and potentially several, Board members put forward from the local community. Since ranches predominate along non-public stretches of the Creeks, having active ranchers as Foundation directors along with fish resource representatives should increase their confidence in the project. The following sections outline why we feel their input is so vital.

3.1 Irrigation Field Runoff

Water leaking off the fields in the summer is hot relative to the Creek. Today, most habitat in this area is temperature limited so that leakage of irrigation water back into the Creeks destroys fish habitat. In addition, water run-off picks up chemicals from the fields, including fertilizers, animal drugs, and animal wastes, virtually all of which are toxic to fish. These issues can easily be addressed through a straightforward, collaborative effort by ditch owners, Davis Hydro staff, and the Foundation.

3.2 Fencing and Ranch Facilities Location

It is currently common to see ranch animals standing in parts of the Creek, which is devastating to the structure of the spawning beds and juvenile habitat, and a source of direct pollution from wastes. If facilities such as feedlots, and holding pens can be moved away from the Creeks, in collaboration with local ranchers, natural soil process can better absorb waste.

H-4. Diversion Screen Support

The irrigation diversion screens in and around the Cow Creek vary significantly in design, deployment, and the quality of maintenance. The reasons for such variance are many and even within any one screen over time DH would propose that, under the direction of the owners, Davis Hydro and the Foundation can facilitate diversion support services, including design, operation, and maintenance services, that meet the irrigation needs of water rights holders and address the concerns of resource agencies.

[1] The canal, especially the downhill side cannot have large trees or bushes on it for reasons of piping.

Diversion design: The diversion could be designed and built to pass fish up and down stream as efficiently as possible. Often the diversion is only a few feet high and an upstream fish passage – possibly a preformed one – could be maintained. For downstream passage, screens are suggested. Our preference is for exploring where possible out-of-channel screens with natural returns designed to minimize injury and post screening predation.

Diversion Operation: The day-to-day maintenance of a diversion is required as screens need cleaning and wear out, floods destroy physical facilities, brushes and gates wear out, and any moving equipment jams with stream debris, etc. This work is similar to maintenance of a hydro facility and there are efficiencies to be gained by using the same staff for both.

Diversion Maintenance: Diversions on the tributaries vary in all characteristics. What is common is that they need maintenance to be effective. By dedicating a project to their maintenance, the diversion could be more assured of correct operation at all times for the benefit both of the water users and the fish.

H-5. Diversion Flow Management

As discussed earlier, one of the greatest environmental problems in many of the tributaries of the Sacramento is water temperatures (Thompson) which creates an environment inhospitable to fish. As diversions of cool creek water into the fields contribute to this problem, we propose work with diverters to reduce the amount of water they use to just what is needed, ensuring more water will be left in the stream and reducing the average stream temperature in the summer months. The best model might include Davis Hydro staff being available where necessary to complete this task under the direction and with funding from the Foundation.

In Summary

Part of the Kilarc Project is fostering a cooperative nexus between the hydro operations staff and the community. Under the funding and sponsorship umbrella of the Foundation, and labor and facilities supplied by DH, it may be possible to work with the community to help operate their diversions to meet all the water needs of the ranchers and provide protection to the fish resources in several ways. Foundation/DH actions might include, irrigation ditch management to eliminate Creek surface runoff, diversion-design to promote upstream passage, leakage management to reduce water loss, diversion maintenance, and/or fish return facility[2] maintenance. All of the actions proposed above have the potential to improve fish resources, and can be undertaken as integral hydropower operations. Most can be undertaken in the summer and can be completed by non-professional contract staff. Finally, a spectrum of other habitat enhancement project activates are "off project" and are discussed in Appendix 2.

[2] Fish return facilities are in-ditch, off-stream-channel, in-diversion return screens and channels for returning seaward moving fish to the creek from the ditch. These facilities have the benefits of easy maintenance and simplicity. They have the drawback that they remove a small amount of water from the streambed below the diversion to above the fish return.

Genetics and Epigenetics

To complement habitat improvements, we propose to work to enhance the intrinsic resilience of the fish themselves. Appendix 3 to this report discusses the key genetic and epigenetic issues that could guide anadromy restoration. There is a limited genetic component to anadromy as only some species migrate. Science is now clarifying both the genetic and epigenetic taxonomy of anadromy[3] and other features of these fish. It turns out that the behavior variability that is observed in *O. mykiss* can be explained not by genetics[4] (Clemento et al Olsen et al, McPhee et al), but by epigenetics (Pavlov 1999, 2008). While genetic differences are seen between differing populations of fish, it has not been shown that there is an anadromous genotype and a non-anadromous genotype that is consistent across geographic populations. Rather, as shown by Clemento, McPhee, Olsen, Pavlov, and others, that for a studied populations, the probability of anadromy is more associated with local environment than any genetic differences[5].

Epigenetics opens a significant window of opportunity to aid fish stock recovery. Unlike genetics, changes in the epigenome occur within a generation, and these can be passed, in diminishing intensity on to successive generations. Repetition of the associated stimuli strengthens the anadromous behavior; other coping strategies compete and diminish its probability and chance of success. This rapid adaptation is extremely significant as it means that coping skills learned in response to environmental pressures are passed on to progeny far faster and more flexibly that any genetic encoding. The epigenome is likely to be the primary encoding mechanism for anadromy and, if we maintain the environment correctly at time of imprinting, we may be better able to ensure Cow Creek fish are programmed for anadromy.

We recognize fully that, as epigenetic management science is still in its infancy, current available research can only suggest, rather than stipulate exactly which approaches are likely to be successful. This is an opportunity for Cow Creek and all anadromous management programs to benefit from and contribute to ongoing research in this field.

Programming

The epigenome is continually updated so that subsequent generations of fish that are anadromous reinforce the imprinting, and their offspring are more likely to exhibit this behavior than fish whose ancestors did not migrate. The converse is also true. Fish that do not migrate, lose the epiallelic encoding for anadromy. Reprogramming this epigenome, or teaching the Cow Creek fish to migrate, is a new complex art and likely to prove challenging.

That said, it is possible to cross breed local fish populations with exogenous healthy fish populations imprinted with patterns that enable and possibly encourage anadromy. To be a statistically successful outbreeding effort, these imported fish will have to be from similar temperature and disease profile populations have compatible base genetics (Frankham *et al*) to

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[3] The concept of epigenome imprinting of anadromy is now sufficiently robust that it has permeated to Master's Level research (Garrett).
[4] Olsen *et al.* found no genetic difference between sympatric steelhead and resident *O. mykiss*.
[5] It may likely eliminate applicability of the Endangered Species Act since no genetic changes are at issue.

enable breeding of new, genetically robust, populations that also carry the epigenetic code that will compel them to migrate.

Homing

The epigenome is also the most likely location of the geospecific "homing" tendency of anadromous fish and carries the geo-specific "smell" of an area that guides an anadromous fish to their natal spawning ground[6]. The anadromy and "smell" imprinting of the epigenome, interacting with the environment, expresses signals that tell the fish when and where to migrate and how to survive difficulties such as artificial variations in temperature. This composite "information packet" is passed on to offspring, enabling the descendants of an anadromous fish from one area to return to that area. The urge to do so is literally encoded into every cell in its body[7]. If the temperature, chemical, light, and other environmental signals are right, the anadromy will be successful. If, however, fish are outbred with anadromous fish from other areas their progeny will be unlikely to hold a complete set of local environmental codes. As a consequence, they will be less able to recognize local environmental signals, and the likelihood of successful migration is dramatically reduced. An area of proposed research addresses the difficult task (Frankham p.381) of taking anadromous fish from one area and having them to survive in another. Losses are very high and the risk of disease and outbreeding depression prevalent. Thus, we need to find not only genetically compatible anadromous fish coded for anadromy, but due to epigenetic inheritance, also their epigenome must match similar environmental conditions to what the juveniles will pick up from their new environment.

In the upper Old Cow Creek, the "anadromous behavior" imprinting has been attenuated over time through inbreeding of fish that are resident-adapted survivors, weakening their migratory predilection and possibly capacity[8]. Separately, the "Old Cow is home" coding has been diluted through hatchery breeding and insemination of the Cow Creek area (CDFG). With this in mind, we will need to introduce new stocks of genetically compatible anadromous fish capable of breeding with Cow Creek's existing fish population, but whose epigenome also codes for anadromy triggered from environmental conditions found by their offspring in their new environment. While challenging, and known to be difficult this is far from impossible[9].

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[6] This "smell" response is a macro version of the epigenetic response of every cell beyond stem cells. Since every non-gamete cell in our bodies carries the same genome, it is the environment that induces it to develop certain structures and to take on certain behaviors. The epigenetic behavior of our anadromous fish is the aggregate manifestation version of this micro-encoded behavior. The balance between permanent genetic encoding and transient epigenetic encoding is clearest at the cellular level. When E.O. Wilson (Wilson) identified the genetic encoding of aspects of behavior in animals in his with on Sociobiology, he did not then extend it to the cell, yet as it now turns out, it is at the cellular level where the epigenome exists and response to stimuli allows expression of the genes.

[7] Most important of course is imprinting onto the gametes for as in genetics, parts of the epigenome are transferred along with the genome to the offspring.

[8] Because of the difficulty of any upstream return in most years, the surviving fish that are the current source fish in the area will have only resident adapted fish left. Any with anadromous tendencies would have left and been statistically unlikely to return in significant numbers. The planting of hatchery fish Buckhorn Lake would only exacerbate the limited genetic pool in the upper Old Cow area due to isolation.

[9] Frankham *et al* discuss at some length the difficulties of outbreeding. The further requirement of outbreeding so as to inject anadromy as well as a diverse genetic mix will challenge the search for suitable source population.

Someday, the understanding the functioning and structure, of the *O. mykiss* epigenome and how these structures encode desired behaviors will facilitate our assistance to these fish to re-establish this behavior will be possible. For now, as practitioners, we can start by researching how to expose fish to various encoding regimes at different life stages. We can husband fish that are genetically compatible and study methods for epigenome encoding needed features of anadromy on their successful progeny. The multigenerational aspect of the epigenome opens some doors of opportunity such as to how to retrigger and rebuild the anadromous epiallele. Rebuilding anadromous populations is difficult to do on the genetic time structure (by competition and selection), and using the Kilarc Project facilities, we can study and we can heuristically use what we learn to help the fish far more rapidly than otherwise.

Geospecific Propagation

The problem addressed is that for rapid widespread dissemination of the behavior, we want to bring into an area anadromous epialleles and the epigenetic survival coding of environment, and behavior useful for survival in the new geographic locations of the upper Sacramento. Conservation genetics suggests that fish living in one area are the survivors of all the environmental elements in that area. For this reason, we must implant fish in specific areas with the proper prior encoding not only for anadromy, but also for geospecific specificity. We hope to use conservation epigenetics to address this geospecificity/anadromy imprinting and timing science to foster anadromous fish populations at each and every different outbreeding location we can in the upper Sacramento River. Just as the "anadromous behavior" is encoded on the epigenome, so to is the "home" location encoded. Understanding that the geospecificity of "home" is heritable through the epigenome potentially provides a solution. Learning how to use, extract, or simulate the remote micro environments for our target populations, and expose fish research needed here.

Research

It is intended that the needed underlying research in this area will be supported or carried out by the Foundation. The Foundation and its work are described in Appendix 1. Davis Hydro is also keen to support this work by ensuring the availability of necessary facilities, human resources and through the supply of contract labor to support related activities. Further, Davis Hydro will undertake, as part of the public community access mission, an education element on the canal. It will help support production, research, demonstration, and education work in the canal (Appendix 4), the Kilarc Lab (Appendix 5) with its nearby Cow Creek research area, and maintenance of the historic powerhouse (Appendix 6) improvements and other public outreach activities.

The research facilities at the Kilarc Project are intended and enabled as support for the anadromous fish resource improvements.[10] Most of the Kilarc Project research facilities will be maintained by DH and integrated into the generation facilities. Davis Hydro will independently

[10] Research is not normally recognized as a valuable component in FERC licensing. In this case, however, we, are now fighting a losing battle to maintain *O. mykiss*, and our efforts would be incomplete if we did not explore how to stem and remediate this disaster. Since the key element we are addressing has just been identified as an epiallelic encoded survival strategy, it is incumbent to explore how to use and extend this science as it develops.

undertake research to further understanding in their own areas of interest, and the facilities will be made available to groups recommended by the Foundation as space permits. Extraordinary efforts such as significant bed and canal modifications for research purposes will be charged to the Foundation as expenses[11]. Exactly how resources will be shared and allocated will be subject to discussion with all stakeholders and, we trust, will be facilitated by the extension of goodwill from all parties as all have an interest in and a desire for the success of Kilarc Project.

Project Methodology Discussion

Natural Recovery

Without our intervention, it is unlikely that Cow Creek fish stock replenishment will be solely, or perhaps even principally, from local stocks. Their genetic diversity has been weakened, and resident-adaptation reinforced through inbreeding(Araki, CDFG). In the long run, without our acceleration, we are likely to see in-migration of alleles that may have a stronger straying and anadromous tendency than the populations we see locally now. Local stocks will need a mix of outbreeding and subsequently geospecific adaptation encoding necessary for survival. The descendents of these epialleles will eventually reestablish the fish here, and may then statistically develop anadromy as a survival strategy. Without our assistance, the re-establishment of anadromy likely will take many years.

An Alternative Proactive Plan

The scenarios[12] described here outline a current vision of how we would like to proceed. Knowing, as we now do, the challenge faced by these fish, after some study of the literature, and given the limited and declining genetic resources available, our first goal will be to work with agencies to build a strong less-inbreed population derived from local California fish. To shorten natural re-establishment time, we will support, and sponsor, carefully orchestrated speeded-up outbreeding activities to re-establish a base population as locally adapted and as genetically diverse as is possible. On this new "local" genotype evolving genetic population base, we will then, over the long term, endeavor to impress anadromy.

The new generations of fish will continue to be challenged unless we also address much needed habitat improvements (described above and in Appendix 2). If we reduce pollution, water temperature problems and managing diversions the anadromous fish might regain an independent existence. Until then, our job, under the direction of the Foundation, will be to assist in every way we can, to maintain a healthy local genetically diverse fish population. DH will work to improve the habitat, and finally assist in every way we learn how to instill and enhance the epigenetic tendency to be anadromous.

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[11] The general expected guideline for the relationship between hydropower under DH or its assignee and research under the Foundation is that non-DH projects will be accommodated at only the marginal cost to the facility; these charges might be for the value of the lost power during bed modifications, use charges for earth moving equipment, cost of specialized bedding material, or the purchase of in-situ cameras, or consumables or equipment for chemical analysis.

[12] See Appendix 7 for much longer ideotypic scenarios.

Davis Hydro will do its part independently. DH will create the wet and dry labs, the office/bunkhouse space. We will put in the communications and data collection backbone for research safety, and production efficiency. DH will provide tools, machines, manpower, and a large facility in which to do research work. DH will do or sponsor, or encourage research projects to help the fish, and we will work with the community to help them meeting their water and irrigation needs while helping the fish. We will stand ready to work with the Foundation to help them meet their objectives. If permitted, at the same time, due to our own interests, we will proceed with fish enhancements and research from internal funds independent from and irrespective of Foundation activity. The independence of the Kilarc Foundation is important for many reasons. The Davis Hydro project will be able to operate independently of the decisions of the Foundation and equally important the Kilarc Foundation will be able to operate independently of whoever takes over the Kilarc Project in the future.

Execution – A Cooperative FERC/Agency Process

Implementation will fall under the direction of the FERC. The licensee, Davis Hydro, or its assignee, will provide services and money to the Foundation. The Foundation is expected to have as its directors, agents of the resource agencies, and the community. Davis Hydro will serve as an expediter during the early phases of the project but is not expected to have any continuing management role in the Foundation. Assuming Davis Hydro can obtain the Kilarc site in operating condition, we would immediately seek to immediately set in motion an organization of the administration of the Foundation to prepare it for operation, including reconstituting the board of the Kilarc Foundation to include primarily resource agency, community, and science professionals. Significant funding for the Foundation will follow the realization of profits after necessary site maintenance, upgrades and repairs.

Enclosed in Appendix 7 are examples of how we can go forward within the Federal, and State laws and FERC procedures. These fanciful, but illustrative development scenarios, are presented as "strawman" paths for discussion and realization that we can do this if we want to.

Davis Hydro is willing to discuss any reasonable variant that is economically viable and in the best interest of fish stocks[13]. DH has described in this document the dilemma we all face in fish resource restoration. Nothing will be more difficult. We have argued that leaving it to natural processes under the current genetic, epigenetic and habitat conditions will not have any reasonable success in our generation. We can develop the tools to shorten this passage. After studying the exploding literature in this area, we expect that any plan we start on in the area of genetics or genomics will not be the same in five years. We embrace that. The science is simply moving

[13] Execution is currently dependent on agency decisions on whether they can accept an aggressive partner in anadromous fish enhancement. After some study of the underlying genetics and genomics, we are convinced that we are addressing important parts of the problem. We have become aware of some of the needed study, and implementation difficulties if restoration of this resource is to proceed successfully. We have tried to outline them here. We are continuing to study the application of the emerging sciences of restoration genetics, the new field or restoration epigenetics. We need to apply this new science to this fish if we are to be successful. Our job is to help them as much as possible in part by fording geographic distances seeking compatible alleles with the desired traits for implanting. As we do so - as we work in a field that does not yet exist, and we will be putting the agencies and ourselves in the forefront aggressive natural resource restoration. Learning will be difficult and full of setbacks, but failure is not an option.

too fast. The fish population and its genetic diversity are collapsing underneath us and the forces against success are too clearly arrayed against us. We therefore are not asking for the acceptance of any blueprint, or even elements, other than the being allowed to work as major actors going forward in the recognition that if we do nothing the fate of the fish is clearer than if we act.

Next Steps

Davis Hydro advocates the plans put forth and outlined here as good for the fish in the short and long term. We hope this document conveys the depth of our commitment to the replenishment of fish stocks, the interests of the local community and the provision of green energy (A listing of Davis Hydro FERC filings[14] is included in Appendix 9. In order to help us realize this vision, we request some of the following steps be considered:

1. Review this Summary of the Kilarc Project

We invite comparison with and consideration of alternative[15] proposals. We are more than confident that this proposal provides greater depth of understanding of the problems faced, and goes further to involve the community in delivering more diverse healthy anadromous fish than any other current proposal. We believe that community trust and cooperation will be essential components of future environmental efforts and believe the project has the potential to deliver responsible green power and fish resource enhancement on a scale that is unmatched by any other private program in the area.

2. Critique this document

We would warmly invite stakeholder input into this proposal in an effort to strengthen and improve it. Most of what is presented here has been discussed in numerous previous editions most of which are cited in the annotated bibliography in Appendix 9. In particular, we would invite input in two areas:

> 1. - How can the proposal be modified to meet the best interests of the fish?
> This alternative is unlike a typical compliance/mitigation set of license articles and conditions. The approach suggested provides for collaboration with and funds a non-profit Foundation to deliver responsible green power and fish resource enhancement on a scale that is unmatched by any other private program in the area.
>
> 2. Ask, what is best for the fish?
> Normally, "Adapting Management Plans," and their variants are an anathema to FERC and hydro developers alike. Such is not the case here. We know that time and existing science are neither on our side, nor on the side of the fish. We will passionately and flexibly pursue the objectives stated here and hope to contribute to advancement of scientific understanding as we do so. To prevaricate or to do nothing, in the face of urgent and

[14] This annotated bibliography is informal, and contains hyperlinks to most all of the source studies and opinions used by DH in developing this project.

[15] Appendix 8 to this summary again briefly compares alternatives. Much more discussion is contained in recent FERC Filings responding to NOAA and CDFG filings. These documents speak for themselves and are only touched on in Appendix 8 for brevity.

ongoing genetic and epigenetic collapse is not an option. In that light, is what we propose here a workable solution?

3. - How can the proposal be modified to meet the best interests of the local community? In this instance, what is best for the community cannot be separated from what is best for the fish. If the community is negatively impacted– more threatened by fire – reduced in size, or has part of its livelihood and recreation destroyed by removing its *reason d'etre*, anger against the fish resource agencies and the fish themselves will be damaging and long lasting. In our investigations, in talks with ranchers and people bordering the Creeks – we are encouraged that all stakeholders clearly want to help restore the fish but is less willingness to work in partnership with the fish resource regulatory agencies. We believe that the support of the local community will be a vital component of resource enhancement efforts and should be included in the calculus of evaluating alternatives. The project structure described here has as its backbone efforts to increase fish stocks through funded community involvement, and extensive outreach and education.

Let us take a decision to save these fish and act as a community as a matter of urgency.
All actions suggested in this paper will lead to uncertain results. Likewise, if the actions in this paper are not taken, the results will also be unknown, but it is likely that they will not be much different from the present conditions for many years. This, of course has yet to be shown. All parties agree that, whatever action is taken, the status quo should not responsibly be allowed to continue for long.

Davis, December 2010

Appendix 1 The Kilarc Foundation

Introduction

The Kilarc Foundation was founded in early 2010 as an independent institution to address anadromous fish restoration in the Upper Sacramento River utilizing funds generated through the operation of the Kilarc Hydroelectric Project. As a corporation[16], it is chartered and exists independently of Davis Hydro and the Kilarc Project. The Kilarc Foundation (herein referred to as the Foundation) provides a vehicle to complement and enhance the operation of the hydropower project in a way that can meet long-term environmental goals independent of any current actors.

Through the Kilarc Foundation, Davis Hydro will address problems affecting fish stocks in the vicinity, in order to create a population of healthy *O. mykiss* with the expression of anadromous behavior. Eventually, we hope to provide the Foundation resources to disseminate these micro-populations as outbreeding sources of throughout the small streams in the Sacramento Valley.

Programmatic Separation

The Kilarc Foundation operates independently from Davis Hydro and as a result can undertake projects far from the Kilarc Project boundaries. The Foundation hopes to work with a range of other agencies, conservation, and research entities, both private and not-for-profit, to accomplish its fish resource enhancement objectives. The Foundation can also undertake projects in furtherance of its objectives without approval of DH, FERC, or the complete agreement of any agency including members of its board. Today, we are in a world that does not easily fit into the legal or regulatory patterns of the past, and using an independent foundation with a dedicated purpose will provide flexibility to partner with both private and non-profit entities to fund conservation projects. In summary, the benefits from this separation is that the Foundation in it pursuit of its objectives, it is not constrained by the constraints put on any of its constituents.

Community Connection

The Foundation as an independent agent can be tightly connected to the community. The Foundation can rechannel some of the current animus towards state and federal regulatory agencies currently being exhibited into understanding and acting on projects needed to improve local habitat. The Foundation can undertake fish enhancements projects work with or without the use of the Kilarc Project framework or if conditions change any projects on the Kilarc Canal or Kilarc hydropower facilities directly. The Foundation will last into the indefinite future with a tethered source of funding and community connection as an independent agent of environmental enhancement, research, and education.

[16] The Kilarc Foundation is a Vermont Non-Profit corporation. Its incorporation papers, bylaws and other documents are available on request or on the Davis Hydro Web Site. It is there because we will be doing work on anadromy on some of our New England Projects in that state and New Hampshire. Should the Foundation become funded by the Kilarc Project, it would be appropriate to have it become a California Corporation and an appropriate local Board.

Foundation Project Choice

The Foundation is chartered to support *O. mykiss* and to support the increase in anadromous Salmonids generally. It is the intent of the Foundation to support anadromous fish resource enhancement projects. It is intended that projects will be local to the funding sources, and the directors of the Foundation will be drawn from local agencies, and local community groups. The current directors will direct the projects of the Foundation toward the support of projects in the area of the funding of the Foundation that, by intent, will be its namesake, the Kilarc Project. Should the Kilarc Project not succeed, the resources of the Foundation will be directed to help anadromous fish wherever its funding is available.

It is expected that the Foundation will be flexible in the pursuit of projects and research that balance short and long term resource gains as the science and income develop. It is hoped that the Foundation will be free to support long term projects, projects outside of regulatory structures, community projects, and will work to attract grants and other funding sources to complement that garnered from the hydropower from the Kilarc Project.

Appendix 2 Off-Project Activities

Administration

Generally, in FERC licensed project regulation is contained within FERC designated project boundaries. There are more exceptions to this as time passes in response to a recognition that environmental effects often extend far beyond project boundaries, generally handled with codified agreements among parties addressed in license conditions. The Foundation will undertake management and funding of virtually all off-project activities. In this case, most of the environmental proactive work outside of the labs and the canal will be done by the Foundation, with only a small amount work undertaken within the formal FERC project boundary.

It may employ Davis Hydro operators or maintenance staff as required, and may conduct projects and research within the Project Boundaries. The following sections describe some of these contemplated activities:

The Old Cow Bypass Reach – New Uses

The Old Cow Research and Production area is in the reach above the powerhouse and currently has an intermittent small population of trout, most likely descendents of resident fish present upstream. There is some habitat in the lower part of this reach, especially in the first mile or so upstream from the road bridge next to the powerhouse. This immediate area could make an excellent research area as it will have data coverage and is very close to the Kilarc Research Lab, and is easily accessible year-around.

Adjoining this area are several ponds and work areas that are fed from various leakages, and overflows from the Kilarc Canal. Davis Hydro has an understanding with the current land owners that these might be made available as experimental stock ponds, though details have yet to be worked out. While the exact projects to be undertaken here are unknown, the following are currently smaller projects of interest to DH staff that could be conveyed to the Foundation at the appropriate time:

- Fish counting and biometric identification and metrology – in particular the measurement of small fish and differentiation of small fish from debris in counters
- Informal Screening – in particular flood survival and maintenance of informal screens, fry screens, and screens with integrated counting technology.
- Redd formation in "difficult" unsorted gravels such as those of the upper reaches[17] that appear on the surface as ideal for fish spawning, but when dug, reveal a dense, nearly impermeable gravel matrix[18] fairly unsuitable for spawning.

The Old Cow can provide a spectrum of field opportunities to investigate the best ways to turn poor spawning conditions into good ones. To use this area to field test the screens, for example. The difficulty of a natural fish population migrating up this far can be turned to an advantage.

[17] See discussion of ongoing gravel study in footnote 32.
[18] These gravels are derived to a great extent from the adjoining incised banks which is why sorting is so poor.

Without natural migration, the area becomes available to study and test technologies that cannot be responsibly tested in a stream with a more reasonable probability of migrating fish.

Stream Diversion Screen Technology

New fish screens are in use around the world. They each have good and bad features. The simple question of whether some of these screens will work efficiently in quiet water can be answered in the canal screen testing areas of the Kilarc headrace.

The test setups can be used to evaluate maintenance needs and efficacy in real streams – real diversions. A starting show, test, and tell area in the Old cow could be a walk up demonstration area for a myriad of screens in various states of testing and development.
Using the sections of the Old Cow as a test area – just upstream of the Powerhouse, for example, allows the public to come and see if and how these new screens work and what it takes to keep them maintained. Coanda[19], flat plate, and similar screens can be compared and improved upon to see if they can be both effective and withstand real stream conditions. Several of these designs may be useful for returning juvenile fish to the Creeks from Diversion ditches.

A side purpose of these tests is a show, test, and tell objectives aimed at local diverters to show how these screens can work to keep their diversions free not only of fish but also debris that is constant headache of splitting boxes and orifices used in flood irrigation. Familiarity with low cost and reasonably low maintenance screens provides a mechanism by which the community can see how they can help save the fish independent of any regulation.

Research and Conservation Grants

Possible projects might include a revolving matching conservation easement fund. It may be efficient for the Foundation as a non-profit to put up matching monies for conservation easements. Under the charter of the Foundation, these would have to be for fish enhancement activities along designated stretched of the creeks. Matching money for conservation improvements generally can be made available at the direction of the board of the Foundation.

Likewise as a non-profit, the Foundation could channel research monies more broadly for studies on anadromous fish resource sciences in new areas as they develop. Currently, we are witnessing a transition of understanding of the needed science and practice from genetics to epigenetics, since epigenetics is filling in explanations of the observed behavior unexplained by genetics. Who knows how that will develop? What is clear is that that much research is needed in this field. How much can be done by or with the Foundation will have to be explored. It is the current intent of creating and using the facilities of the Kilarc Project partly as a research facility, and these facilities and the Foundation money might be useful in attracting more dollars to the area for the direct an indirect benefit of the species.

[19] See for example, http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0841.pdf

Anadromy Imprinting Expression Research

For example, a key area for research may be epigenetics. Matching funds for epigenetic imprinting research with university faculty and students is suggested as a needed goal. It is unknown when, and how to most effectively a fish acquires the tendency to migrate. The literature, and our own writing divide *O. mykiss* into "resident" or "anadromous" based on behavior. It remains unknown under what conditions they acquire – if they do so, the behavior, rather than simply exercise an innate ability to migrate to sea and return. It seems possible, if not logical that the behavior is encoded to varying degrees and it is environmentally triggered. If so when? Can it be reinforced? Is the behavior is passed on generation to generation like other epigenetic traits between generations, or is it embedded in the genes and passed on as any other genetic trait? The difference is profound not only in terms of the applicability of the ESA, but more important in what we can do to reestablish populations of anadromous fish.

This is fundamental, but very difficult field research. It is important because if we do not understand how to imprint and reinforce anadromy, and if possible, to trigger, the anadromous behavior, we will be very constrained and much less ineffective in any restoration activities.

The work to observe environmental triggers is difficult in that it required open field studies not only of the detailed environmental conditions seen by the fish at, but also the behavior of the fish. We need to integrate the screening facilities contemplated in the above activities with close environments monitoring to see when and what triggers the fish to move downstream. The temporal calculus of encoding parts of the non-inherited parts of the anadromy epigenome is undefined. We may be able to set up field lab conditions to test this. Exposing the fish at different times of its development to different stresses and see exactly what timing and conditions predict anadromy. This is valuable because once we understand the triggers, or even the correlates; of anadromy we can use that information to more efficiently induce or introduce that behavior in a new population.

Pumping and Temporary Diversions

One of the problems in the whole of the upper Sacramento River is the large number of irrigation diversions scattered along the sides of the main stem of the Sacramento and many of its tributaries. In talking to ranchers and farmers who divert water, we have come to realize that a great many would like to be responsible and protect the fish, but are unwilling, and usually unable to install screens that would meet agency approval. This reticence can be for many reasons; the diversion is illegal, too small, intermittent, or commonly a lack of money. The diversion's owners may not have the ability to maintain a diversion, for reasons of ownership, law, health, organization, tenure, or responsibility.

Most irrigation pumps are essentially unscreened from the perspective of a 10 mm fish migrating downstream. These pumps deliver small fish into the irrigation water at the top or near the top of the riverbank at steady rate. An area to be explored is can a dimple – perhaps portable screen be built easily and economically given various geometries of irrigation water lift outfalls. Perhaps a portable modular system could be designed and tested that is operated and maintained at no cost or involvement of the farmer. Approved diversion screens are expensive, and as with most conservation measures not in the interest of the person leasing the land. Approved diversions are

generally massive concrete structures that have up and downstream passage built in and can require extensive maintenance. Can we look at ways around this?

A project might be to build along the upper sections of the Old Cow a series of demonstration diversions that have upstream and down stream features to show people informally how they can modify their diversion to be varying degrees of fish friendly. The temporal features of the diversion screens would be compatible with other projects going on in the Creeks such as screen testing, fish counting, anadromy triggering, etc. The fish diversions in the irrigation water would allow for surviving fish to be channeled back into the Sacramento River or into nearby creeks. Since each unscreened diversion is unique, the project can show various types of screens and diversions with varying degrees of construction and maintenance involvement. Each would have some analysis of what fish this would be effective for, costs, and maintenance issues.

The projects might have four different parts.

Human Engineering: The question how to best approach legal and illegal diverters and get them to cooperate in saving the small fish.

The Diversion Process: It is clear that nearly all the pumping irrigators in Northern California are illegal if they use Sacramento River water since there are "listed species" in the water. That said, when an enforcement action is not immanent, can we get cooperation for these diverters outside of the regulatory process.

Focusing on the pump and diversion physics: Can the diversion be designed better to reduce entrainment? Can the pump be better designed to do less damage to small fish? It is clear that not all small fish are killed by being pumped up 20 or more feet to be dropped onto an irrigation canal. This is clear form observation. It is also well documented that larger slower moving turbines or pumps have only a small morbidity and delayed mortality impact on some fish. The smaller the fish are the better they do. A research and pragmatic anadromous fish protection question, then is, "where and how can equipment be changed at low cost to protect the fish?"

The constant flow rate of pumped water makes some screening such as the Coanda practical and simple to assure optimal filtration. The small fish are screened and returned to the river via a pipe from the top of the riverbank. The constant flow, and the controlled conditions of the bank make this process simple. It is conceivable that the return rate might be near 60 –80% % based on similar, based on mortality studies from for larger hydro turbine.

The Return: One of the problems of nearly any fish screening and return process is how can the fish be reintroduced into the river without disorientation and resulting predation. A protected resting period is needed on re-entry to minimize predation by fish waiting at the outfall. This outlet resting function on active riverbeds is a worthy research question in its own right. What is needed is an acceptable economical return structure that is both economical and compatible with the unstable dynamics of riverbanks.

Appendix 3 Genetics and Epigenetics

Current practice of anadromous fish conservation deals with habitat, passage, predation[20], and genetics. Genetics are likely to be of partial importance in the battle to reestablish anadromy in O. *mykiss*. What will be important - after, and independent of habitat improvements is the epigenetics of the species. Specifically, how can the emerging science of epigenetics be used to reestablish a healthy set of diverse populations of geo-specifically imprinted phenotypes that will exhibit the desired anadromous behavior in all the different sub-populations that will be necessary in the upper Sacramento?

Previous species level thinking model of Salmonid anadromy is that there are various sub-populations of genetically slightly different fish that have varying phenotypic tendencies toward anadromy (and other behaviors) in response to various environmental factors. This has been accepted dogma for many years. The difficulty with the theory is that in many populations there is little or no genetic difference between the anadromous and resident ecotypes. In addition, in some populations, there are genetic differences between groups of predominantly migratory and resident fish population on the same river, but it is not clear that these differences have anything to do with anadromy. They might be coincidental rather than in any way causal.

An updated and quite different thinking is that certain patterns of imprinting of a quasi-plastic O. *Mykiss* epigenome by its environment will increase the tendency for a plastic phenotypic anadromous response to the environment of the Upper Sacramento River tributaries. In short, the genetic expression of anadromy and many other phenotypic features of the genes are controlled by the epigenome. This epigenome can be effective over multiple generations. In some animals, the environmental effects on a gamete genome can be traced through several – sometimes tens of generations. The important point here is that the genome (and thus the species, however subsetted) is the same; it is the genetic expression that varies due to the regulation of gene expression by the epigenome.

This regulation of gene expression is controlled by a DNA methylation patterns. If this anadromous signature process on the epigenome can be artificially established or instilled though outbreeding, and propagated across generations, it might naturally propagate in sufficient numbers to generate a population of anadromous fish where none were there previously. If a robust anadromous epiallele attains a sufficient population that is stable and broad enough across a healthy diverse genetic base, we may be able to address and possibly, reverse the genetic, and collapse of the epigenomic diversity and population health currently underway. This mechanism, phenotypic plasticity, appears to be present across a range of genetically different fish, so that the establishment of the anadromous response is related to the robustness of the population not necessarily to the exact composition of the genotypes[21].

Davis Hydro is presently involved in discussing methods for restoring the anadromous epiallele of O. *mykiss*. To do this, work focuses on understanding evolving the applicability of

[20] In this summary paper we do not address fish passage, or predation.
[21] Since there is no role here for the "endangered species" in the sense of genetics, it will be an interesting question whether the intent of the law can be extended to epigenetics which is both inherited and environmentally imprinted.

epigenetics rather than genetics as applied to these fish. Most of the features of this field are being aggressively researched in humans and then extended to other animals because the nutrition and nurturing environment of the human genome create dramatic epigenetic effects on the phenotype whose effects can be easily measured in later generation. Similar effects are predicted in fish. These epigenetic effects are heritable and affect the descendant phenotypes for generations not unlike what possibly happens in humans. In fish, it is not easy to differentiate any epigenomic patterns at present along the genome that predict anadromy as the existing tools are too crude (Blouin).

The "resident ecotype" is genetically similar or identical to any other *O. mykiss* but without a strongly anadromy vector imprinted in its epigenome. The environmental effects on the structure and function of the phenotype are primarily within the span from gametogenesis in the parent to death of the individual. The intergenerational epigenetic effects decay, can be overprinted, and are reversible over a number of generations. The rate of decay is unknown. We know they are not limited to the life of the genome in humans. Reversal of epigenetic effects is inevitable and attenuated through the generations. In humans, as in fish, repairing, or modifying the encoding epigenome within a generation is the way the epigenome becomes encoded including the gametes. During gametogenesis, this encoding is passed on in some cases detectable for many generations. Thus, anadromy[22] is encoded, and amplified or diminished with the degree of repetition at or before the time of gamete formation. The "resident ecotype" is genetically similar to any other *O. mykiss* but without a strongly anadromy vector imprinted in its epigenome.

Given the similarity of the fish genome and its processes to the human, careful monitoring is suggested as the level of human research is currently at a very high level for possible medical interventions that would directly on the gene expression.[23] Progress in this field will immediately be applicable to progress in understanding and managing fish behavior. We need to understand how to trigger, use, and amplify the encoding anadromy, and to suppress the behavior for residency in a population that has statistically lost its tendency to migrate.[24]

The reestablishment of a healthy anadromous population of steelhead will require major epigenetic work far beyond anything that has been contemplated to date. Specifically we are now aware of the dimensions of the tasks ahead to help this population. We are aware of the phenotypic plasticity of O. *mykiss* as well and the traditional conservation genetics we will have to use to re-establish this population. We make no pretense at understanding any more than anyone else exactly how to solve the non-environmental problems of the observed collapsed

[22] The macro phenotypic trait of anadromy is no different than any other behavioral trait, except that it has a political constituency, and thus becomes valued both for its sports value, but also as an iconic symbol of a macro habitat condition.

[23] The importance and universal applicability of research on how cells with fixed genes express themselves in real time cannot be underestimated. Results will be applicable to any genetic based disease such as various cancers, or in our case, behavior like ADD, or anadromy.

[24] In this paper we are focusing on anadromy, but this technique, once mastered may be even more useful for amplifying other traits that will help *O. mykiss* survive and prosper in a man-altered world. The ability to acquire a lifestyle to survive in the inverted temperature regimes downstream of dams, for example, may be equally or more valuable.

anadromous fish resources in the Upper Sacramento. Simply put, the science is too new. But we are sure that the "genetic" solution involves a major contribution of epigenetic manipulation.

Upper Sacramento Restoration/Re-establishment Tasks

Genetic Basis

There are two major stages of restoration work that have to undertaken, first is the classic restoration genetic efforts (Frankham *et al*). This is a necessary first step to provide a genetically stable population with enough diversity to provide for a healthy multi generation population with multiple generations with a wide range of genomes represented over several generations. This however, says nothing about anadromy, simply that there are enough different fish in an area to provide a healthy genetically diverse population on which epigenetic patterns can be imprinted. This is not a small step. It encompasses all the required work genetic necessary to recover from genetic collapse due to hatchery operations and poor genetic tolerance to modern river temperature and chemical regimes.

Epigenetic Imprinting

As that traditional genetic restoration work progresses – hopefully under the leadership of the CDFG, there is an entirely separate additional work needed to infuse epiallelic imprinting of anadromy. We need to imprint anadromy on fish epigenomes so that they will trigger/express anadromy as a result today's environmental conditions. A modern response sensitivity is needed that will trigger the appropriate behavior that will allow the fish to survival in the ecosystem we as humans have created for it. This work may be difficult, it may not, as these fish have shown remarkable adaptability around the world. The imprinting of anadromous behavior may take imprinting on both parents. It may take several generations of migration to imprint the anadromous epiallele with enough significant statistical reinforcement so that can be reliably transferred intergenerationally. Once established in the stable population, it may last for several generations declining over time. It may be sex-linked thus requiring a higher degree of saturation before it is reliably expressed in a population, or it may have other unknown characteristics.

Once a healthy population O. *mykiss* exists, its own straying tendencies will cause some of the variance in behaviors to lead to anadromy in some individuals. If these can return (obviously, not to the Kilarc canal directly) they will be stronger and may well be able to out compete local O. *mykiss* at breeding. The difficulty of returning breeding at Kilarc is the main reason it makes little sense to focus too much energy of establishing a wild resident breeding population there. Even if the returning fish could get up to the power house, and even if there were no competition from resident fish populations upstream the generated population will be small and uncommonly accessible, inhibiting the formation of sufficiently genetically diverse and robust base to allow the resident genome on which the anadromous epiallele is resident to exist.

Geographic Diversity

Our field implementation approach is expected to be quite different from what has been used in the past. As we begin to define and acquire healthy alleles that have anadromous tendencies, we need to reinseminate them at early life stages, not only to the Cow, but also to all the small tributaries of the northern Sacramento. We see that this important so that whatever local genetic selection and local epigenetic imprinting that has bee acquired can be passed down and mixed with stronger anadromous allelic imprinting from other – out-of- area, and hopefully non-familial related phenotypes.

The most effective way to do this is to choose some of the fish with the strongest anadromous tendencies from large genetically-diverse populations from similar climate, temperature, and chemical water regimes as we have here, but ones that have as weak inbreeding with Sacramento genotypes as possible. It is quite possible that these genotypes will not be from West Coast of North America, but from northern Europe or Asia generally. What is desired is a diverse genetic community with a strong expression of anadromy; while at the same time we need fish whose epigenome is climatically adapted to regimes similar to the target areas here on the Upper Sacrament River. Given these matches and assuming genetic compatibility, they hopefully will be able to interbreed profusely and not suffer from outbreeding depression or bring in any significant diseases to which the local geo-adapted fish have no immunity.

Propagation

Up to this point, we have outlined the environmental, genetic, and epigenetic work that has to be underway as part of any restoration effort. However, there are several additional problems even having all these in place that have to be overcome:

The existing populations of resident-adapted fish living now in refugia in the upper area of the Sacramento will emit resident-adapted fish downstream into the indefinite future. This will put constant pressure on any imported anadromous epialleles. Further, assuming that there is significant inbreeding (CDFG), then they will contain many of the same genes as the fish downstream that are being interbred with foreign anadromous stock. How are these two factors to be evaluated? How is this to be managed? Do these fish contain useful location-specific attributes like disease resistance and other local-adaptation genes that will be an asset? This is unknown, and will have to be left to the work by the Foundation to discover.

A second problem is that the mission is the return of *O. mykiss* anadromy to the Upper Sacramento River, not just some part of Cow Creek. Each different area of the River – each different creek, will have a different set of features that may or may not be important. Known ones to be considered include resistance to local diseases, local pollution, and local temperature patterns that are different depending on upstream releases and diversions. These are local adaptations. Conversely, each different area has a different "smell" so that anadromy imprinting on any fish that should migrate will be geo-specific on its return.

These factors mean that to successfully breed in anadromous tendencies from foreign stock, the best local alleles are probably different in every geographic area. This variety of local-adapted epialleles triggers the need for small population cross breeding, most likely done with parents

taken from the target local areas. It might also be possible to raise a numerous different outbred fry specific to different Creeks. It is possible that the headrace can be modified to keep different fry populations isolated. This will not dramatic. Releasing pods of a few tens or hundreds of small fry into diverse Creeks up and down the Sacramento hoping that the different batches are successful will be difficult to justify given that the measurement of the degree of success is difficult.

Summary and Impetus

Why is this element here? Why spend some much time with epigenetics, when clearly we first have to have a healthy stable diverse population on which to work. In summary, the answer is that it will be essential to understand, incorporate, and address in detail the difficulties of implementing an epigenetic imprinting on top of a base when that base population does not presently exist. Specifically, we have two missions that are not independent; first to have a healthy genome distribution and second, encasing that genotype in an epigenome that favors anadromy when triggered and when appropriate. The "when appropriate" is likewise not any historic pattern perhaps encoded in the underlying genome, but in modern signaling structure that addresses the moderns world.

The first step will have to be the establishment of a healthy population of *O. mykiss* whether or not any in it are. This is essential; otherwise there is no population on which to have the anadromous epiallele develop in. Restoring genomic diversity in a geographic area that is so challenged the existing population has collapsed.

We must proceed down these two roads because the only alternative is natural processes of straying and auto-stimulation of anadromy in fish that have a poor epigenetic predilection to support it. The work of the Foundation will have to be designed to supplement the natural processes, hopefully it will greatly speed up the reconstitution of robust healthy populations of the anadromous ecotype far faster than natural processes for reasons discussed elsewhere in this paper.

Appendix 4 The Kilarc Canal - Production, Research, and Education

Canal Description

The Kilarc headrace, also called the Kilarc canal is about 3 miles long. Roughly one third of its length is made of concrete channel and metal conduits. In these, there is no habitat possible and research is limited to fish kinesiology, and artificial fish passage micro-refuge design. Because the flow is regulated precisely, the canal is conducive to experiments on equipment that is applicable in conduits and other artificial structures. About a mile of the remainder of the canal, contains long uniform reaches that run along a north facing, forested slope. It is in these sections that varying local hydraulics from canal features such as boulders or boards, tree cover form overhanging trees and brush that different research and research/production studies can be constructed and conducted.

Initial Projects

The following projects are of interest to Davis Hydro and are suggested for the Foundation to consider at this point. Currently, we are studying the science connecting anadromy and epigenetics. By the time we have funding for work, these ideas, expressed below, will be either greatly fleshed out or replaced as our understand of the behavior increases.

Spawning beds – Experiments

Controlled [25]screened spawning grounds are expected to be part of the canal. We are investigating the possibilities of using each of the production and research spawning beds differently to imprint different conditions on the fry in the gravel and perhaps during their first year of emergence. To do this properly the different groups will have to segregated so that they can be can be imprinted differently. Clearly, this is a problem in a production facility, and clearly it is a problem in a public river or site open to vandalism. The open nature of the research station is part of the research mission.

The "problem" can be extended to research on screening and counting small eggs and fry. To the extent we can experiment of different groups of fry, we can investigate variability in identification and encoding various genotypes, alleles, and anadromous epialleles to be adapted to different target locations up and down the Sacramento River. One of the things learned from the hatchery study is we do not want large production of from few parents. That triggers a research agenda on how to produce many geo-adapted fish from many, but specific parent population(s), on a production basis economically.

[25] We would also like to provide facilities for studying and perhaps breeding isolated populations of other species of interest such as red legged frogs to protect their genetic diversity. This discussion will go beyond the purpose of this paper.

Spawning beds matrix study areas

The facility will be modified to accommodate gravel beds of various sizes, hydraulics and covers to study fry development both in-gravel and during the emergence and first year of life. Davis Hydro intends to provide researchers with data links for doing in-gravel studies of trout egg development. The only limitation on this activity is winter ice sheets and the damage that these sheets will do to beds prepared for study the previous fall.

Video bandwidth is intended to be developed as an extension of the security system, and we intend to provide remote secure data gathering facilities linked to the new Lab near the powerhouse. The data facilities will be an adjunct to the SCADA backbone systems to be installed to control the site. The data links will allow for continuous sampling as necessary.

Due to the easy access and the outreach mission of the facility, it is likely that we will have live TV feeds to the public displays in the lab showing the developing eggs, alevin, or fry. A major commitment of Davis Hydro is to provide these facilities and connect people of all ages to the fish.

Micro Screens

There is a lot of discussion, regulation, interest in, and difficulties with small pore screens for the containment and channeling of small fish and fry in certain directions. The collaboration of Davis Hydro with the Kilarc Foundation and the cooperation of local landowners provide both laboratory scale and control coupled with field exposure in the Old Cow. In the canal, we can provision research areas with slowly varying flow; a myriad of screens and screen types will be built and tested. In the Old Cow near the powerhouse, field studies of the same screens can be tested and demonstrated in actual field conditions.

In the canal, we have partially controlled conditions – quite different than the open channel screens that might be field weather/flood tested and displayed down in the Old Cow. The screens to be tested here would be applicable in our conservation (epi)genetics, production facilities, and lateral vegetation microhabitat studies.

Fish Passage

In many cases, manmade conduit or lined channel channelization has limited upstream migration. In this facility, specifically within the concrete flume sections of the headrace, with the data collection, in the summer, we can study the physical performance of fish in highly defined conditions[26]. Further, using the constrained geometry of the concrete channels, various types of hydraulic breaks can be installed and studied to see how fish of different size and type can use these hydraulic impediments to rest and pass upstream. Specifically, if a block – say a standard masonry concrete block is put in a concrete channel, it will provide shelter from the

[26] All canal activities and this is no exception is the interaction of breaking ice sheets and any obstacles in the canal. Ice may limit these activities in the winter. Any block might also stop an ice sheet or a small tree that has fallen in the stream and that tree held by the block will stop more debris causing quickly – and usually in the worst weather, a flooding condition. In the Kilarc canal, this is a constant problem, in that is there is any overflow, the supporting hill will be eroded quickly and the canal lost.

flow behind it that can be used by fish for resting while working upstream. It is expected that both the data link and the video links will be useful for this research.

Fish Kinesiology

The concrete channels provide long uniform channels to conduct studies of how well the fish are able to physically swim against long stretched of current. Due to the linear nature of the headrace, it provides a limited but low cost racetrack where fish released at one point can be tested for statistical passage various distances against a range of current.. Different fish have differing abilities at different times in their lives to negotiate upstream against a flow. Because the flow in these concrete channels can be regulated by partitioning and controlled precisely, some of the concrete flumes make excellent placed to study fish energetics.

Education

Since the end of the canal is accessible about 10 months of the year, and it will have a public outreach and education component primarily maintained by Davis Hydro. The canal will have information placards in two kiosk (Mono Lake type) information huts describing various features of what is going on in the canal, and explaining how the works there help the fish. Other placards will here at the canal and down at the power house will show the life cycle of the fish and what can be done by everyone to help them. Maintaining this type of information facilities is both expensive and frustrating; we recognize this DH activity in advance.

Another educational section of the canal might be used as a nursery for small brush stock for summer planting along the sides of the Cow.

Macro-invertebrates and Production

It has been suggested that if we can "section" off distinct reaches with different flora and fauna present, it may be possible to study local relationships between plant growth, macro invertebrates, and fry development. An objective of this area of research is to increase understanding which vegetation is most effective in providing the best environment for fry development in adjoining spawning grounds.

Conclusion

It is not a purpose of this paper to know or specify research in this area, and we are sure that current ideas will be replaced or improved upon by fish biologists working for the Foundation. Exhibited here are ideas simply to show willingness and the breadth of possible projects for the canal when DH is working with the Foundation. Generally, DH is actively looking for partners who are interested in action plans to study the fish and testing ideas to help the fish. We are willing to consider cooperation and separate support all variations of these projects, and hope that we can find partners who are equally intensely interested in helping this environment.

Appendix 5 The Labs

There are two buildings in the powerhouse area. The powerhouse is described in Appendix 6. The second building still standing is ideal for conversion to serve the hydro and the research. It was a transformer and switch building as originally constructed. It might be renamed the Kilarc Lab. We would like to refurbish the insides to accommodate the following facilities:

A Davis Hydro office. – The Office

The Kilarc Project office would probably only be one room with one or two desks and a series of monitors following the hydropower, along with local research and environmental monitoring. This station is expected to be visible through a glass wall by the public from the access hall. Since we no separation between the mission of the hydro and that of the whole facility, it makes sense to consolidate the functions in one room so that one person can monitor as much as possible. Typically, in most hydro operations, as in most fieldwork, there is a lot of remote equipment monitoring mechanical or biological processes with long periods of very boring monitoring. Since the hydro will be have a SCADA system partially visible by the public, it will make great sense to extend this capability to research projects.

A museum-public access hall – The Hall

The small public access hall would look into the facility office where it could see readouts of the present hydropower and experiment data and conditions. It would also look into the lab where there would be displays showing the data collected at other times and perhaps an infra-red in-gravel video feed from experiments in the canal or up on the Old Cow. It might also have a display historic pictures, live sound, data and video feeds the public could form various parts of the facility and public access. We expect to have the canal security system tied in so that it captures the rapid movement of people catching fish and fish spawning for display on the monitors[27].

We also want to have live TV feed from the Pelton bucket areas of the turbines lit by strobe light so that:

a. we can see that the needle valve is focusing correctly and not blocked,
b. so that people can see how the turbines work, and
c. the SCADA system will have live feeds showing how much power is being generated,

Finally, other security camera video pick-ups will incidentally be triggered by wildlife as well as fishermen. We expect, based on our own encounters, to see cat, bear, fox, and eagle. Critical to the Foundation and DH mission is to engage the community in being a part of helping these fish thrive.

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A Wet Lab

The Wet lab will be a space with Old Cow water continuously available for "lab bench" study elements, dissections, tag insertions and sample counting filter analysis, screening, similar operations. The wet lab will provide stone and stainless steel tanks slabs and fish holding facilities and possibly along with chutes to quickly return fish to the stream as warranted without harm.

The Dry Lab

The "Dry" Lab will have workbenches and desks for lab analysis of samples. It will have desks and cubicles all with DSL Internet data connectivity, refrigeration at 36° and –20°F freezers, and shelves for sample storage.

Data and Experimental Support

Hardware and Infrastructure

Primary and Secondary Nets (O-1.1 and O.1.2)

Davis Hydro will construct redundant Ethernet backbone networks extending from the lab to the powerhouse, up to the forebay, up the canal to the diversion. These are necessary for operations and will be scrupulously maintained. They will have completely separate data paths. One will be designed as a modular Zigbee-based self-healing[28] mesh network. The second a tandem dual channel wireless based system with one router on the tower at the outlet from the forebay and a second parallel router on the hill to the north which covers the entire canal.

These nets will be used both for SCADA services along the whole canal, but also to collect whatever data the scientists will generate. The dual purpose is possible because the SCADA data traffic from monitoring and controlling flow in the canal is minute. The video will probably ride on these parallel networks.

Research Nets (R.1 - R.3)

As money permits, and possible research warrants, and if permitted, we will extend non redundant data nets up and possibly down the Old Cow for research purposes. These radio-based nets are similar to what we are designing in other venues for remote wind data collection. If permitted and if useful network R.3 will extend up to Buckhorn Lake for fish population, flow, and research project monitoring.

Video

Video: We expect to have video capability along the canal backbone for four independent reasons, site security, fish protection, public education, and research support. The cost of this service is now minimal, and will afford better protection of production and research equipment. It is now standard at our hydro sites.

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[28] In this environment, hunters, birds (eagles and ravens) attracted to shiny surfaces, perform random acts of incidental sabotage are common.

Telecoms / Community Service

It may be possible to establish a public commercial telephone cell repeater in this area. This would provide cell coverage to Whitmore residents and the surrounding valleys. The elevation geomorphology of the forebay will made it possible to economically allow commercial public telecoms, video and Ethernet networks for both Project use and Community Services.

A Bunk House and Kitchenette

Fish and their predators can be very active at night[29], so it will be useful to monitor experiments locally at night, and or on a continuous basis. Both DH and research people need local places to stay without continuing to lean on generous community members. The closest hospitality area is all the way back to Redding. Therefore, we would like, in the first few years to incorporate a bunk space and a few very small rooms for visitors to stay while engaged in hydropower operations, or – more commonly in scientific work at the site. This will allow for rested 24-hour presence for studying the following types of issues: nighttime upstream and downstream passage, predation feeding, and other research issues.

Operations

Normally hydropower operations are unattended most of the time assuming equipment is functioning properly. Other times hydro sites can be manned 24/7 with staff observing hydro operations during equipment problems or weather uncertainty. Typical examples include fires in the area, ice sheets, rocks, or leaks in the canal, screen management, fish counting, electrical problems, and other processes that need constant monitoring. The operations overseeing hydro operations are similar to those for many field experiments, so it makes a lot of sense to set up human and mechanical systems to assist in both functions. Once again, we see little conflict, and great economy in setting up joint projects and joint use of communications systems.

[29] For some unknown reasons hydropower problems tend to occur in the middle of the night.

Appendix 6 The Powerhouse A Living Historical Monument

The powerhouse will be maintained in its present conditions with only a few changes. The generator controls will have to be updated to comply with a new interconnection agreement and needs for remote Internet based telemetry and site management. In terms of looks and historical preservation, DH suggests that the current control panel will be maintained as it is with no changes for historical beauty. The actual control of the turbines will be turned over to a new inconspicuous PLC controller that will comply with modern standards.

As an aside, automatic controls and interface with CALISO will be made for the control and dispatch of ancillary services. This is useful so that ancillary services can be sold into the capacity market. This service will reduce the need for generation capacity in California, reducing environmental burden.

In the yard in the back of the powerhouse we expect to have more information placards connecting the visiting public to the stream and its fish. The back area will also be fitted with a simple picnic table and benches.

Appendix 7 Example Paths Forward

Davis Hydro LLC as Principal

While this discussion refers actions of Davis Hydro as the licensee, the hydropower operator, the research facility owner, as a "Davis Hydro" project, all small hydro projects are set up as their own corporations or LLCs to enable them to operate efficiently without interruption from any other DH project. The Foundation will be supported by the profits of the Kilarc Project, not Davis Hydro LLC, allowing it to operate independently from Davis Hydro. Funding the Foundation would be by a FERC license condition codifying this relationship for whoever takes of the Kilarc FERC License in the future.

Scenarios

In the first year – or hopefully well prior to the transition, community and agency people come together and discuss what they want for and need from a continued Kilarc operation.

The needs and desires of the community have been made clear. Among other things, they don't want an increase in forest or community fire risk with the removal of the forebay. They would like their domestic water sources – to the extent that they are influenced by the Kilarc Canal to remain or improve. They want their Kilarc recreation unchanged and fishing related businesses to survive and they would like fishing generally to stay as it is or improve. The fish resource agencies want healthy fish populations as representatives of healthy ecosystems. These objectives may not be incompatible. There is no conflict here; only opportunity in that hydropower has the capacity to generate resources to enhance fish resources far beyond what would occur naturally. Natural fish resources, were they ever again were to thrive here, would be limited by natural migration barriers. With work, under a new hydro operator interested in the fish, we can more rapidly create an anadromous population and improves other fish resources not only in the Old Cow, but up and down the Sacramento River.

The historic difficulty is that the resource agencies have seen the hydropower facility at Kilarc as a contributor to the decline of fish resources in the area. That is a difficult premise to sustain in the case of the Kilarc facility because of its temperature effects and natural barriers. This issue is discussed in Appendix 8. The solution proposed here is to constitute the Kilarc Project with a new FERC license so that it produces more fish and a healthier habitat than destroying the facility.

What would implementation of the Davis Hydro scenario look like? In the two sections below are two fantasies in that direction. These presented fantasy scenarios assume that DH is allowed to focus not only on using the Kilarc facilities directly for fish production, habitat maintenance, and research, but also will allow us to extend our work up and down the Sacramento River through the Kilarc Foundation. In the following two scenarios, no intent is to suggest a final arrangement. Nothing presented here is to be taken as agreed to or even, in some cases, discussed. The ideas are presented here as starting points only to be improved on by people interested in creating solutions to a serious series of problems rather than on what cannot be done. Why not try?

A Possible Scenario I – PG&E Leases Kilarc

Year 1

This scenario assumes that the first year will be dedicated to repair of the facilities and the first half of upgrading the turbine controls toward eventual independent operation. This will be required by PG&E as part of the separation of the facilities. Depending on the amount of deferred maintenance, this work may take longer than a year.

This first year will see the discussion and start of the following projects undertaken by Davis Hydro internally:

1. A dual data backbone network installed to allow communication up and down the headrace for both operations, and environmental monitoring, and the beginning of the conversion of the old transformer building to an office/lab for operations and research.

2. The Kilarc Foundation will solicit directors from the appropriate resource agencies and from the community. They will review the charter, mission statement, and incorporation of the Kilarc Foundation and discuss how its structure should be constituted and who are the most appropriate directors.

Offsite Research

The offsite work evolved from what is presented here will be suggested to the Kilarc Foundation directors and staff. Environmental activities will include the initial stages of finding source populations that might be used to be introduced into the area. To the extent permitted and possible, genetic maps of local populations of rainbow will be made and examined for diversity.

Particular attention will be made to find and examine populations that have been isolated in refugia for a long time. Based on the 2010 CDFG hatchery Report (CDFG), we are not optimistic. The desire here is to collect as much information as possible about the diversity of geographical local populations. No attempt will be made at this stage to identify anadromous fish, only those fish that are as diverse as possible within somewhat similar environmental conditions. Resolution of what this "ancestral" population might look like, and whether a pre-Shasta Dam – lesser pollution tolerant genotype – adapted to their ancestral environment is appropriate or viable today will be both discussion and research topics – with no certainty of clear answers.

At the same time, we will start looking far abroad for *O. mykiss* that are living in similar habitat conditions. Work will proceed with agency and staff biologists exploring the question of balancing alleles that have expressed anadromy, local populations, and outbreeding populations that will be useful for increasing the health and genetic diversity of a re-established population. This is very complex work in a field that is poorly explored – especially in light of the new epigenetic understanding and manipulation of anadromy and geo-specific allelic specificity and

compatibility[30]. It will have to proceed slowly in that selection has to be made not only of the origins of populations, habitat compatibility, but also for disease transmission, and simple genetics compatibility.

This genetic issue has to be addressed and the local population has to be started on as clear a path to a healthy balance of diversity and local adaptation as possible. Nothing here is said about anadromy, only that we want to establish a genetically diverse local population on which an epigenetic pattern can be developed, most likely through insemination from a distant anadromous population. How this can be accomplished in community counting on continuous fishing. This may be impossible under the political pressure to dump millions of partially related trout into the streams for fishing. Prior reasoning suggests that if we end up with a continuation of the inbred hatchery populations consequential genetic depression will continue and the concept of a self-sustaining population on which anadromy might be imprinted is not supportable.

In these initial discussions, the structure of the research has to deal with the stark reality that there is currently no genomic, and certainly no epigenomic map that leads to the expression of anadromy. Thus, we can only use this model for empirically exploring for the right balances of genetic and epigenetic mixing given only an initial understanding of the underlying mechanics. Later, we hope to do better – to be able to suppress or enhance genomic expression to regulate behavior, and geospecificity among other phenotypic traits.

Epigenetic work might start – if funding permits, and with a paper research program into what is the most likely imprinting mechanism, and what are the multigenerational aspects that can be expected for both imprinting and expression of our desired anadromous behavior. Given that neither the structure of O. *mykiss* anadromous genotype has been defined or separated from the non-migrating genotype, an area of investigation will be to define what, <u>if any,</u> are the distinguishing genetic characteristics that are necessary, sufficient, or even indicative of anadromy across populations. This is not expected to be fruitful based on the extensive work that has found no genetic basis for anadromy in this summary. It might be useful to hold a small conference and clarify the question of, "If anadromy is not a genetic issue, not an endangered species issue, what is the highest and best use of our resources." We expect our work may evolve toward, "How can we best contribute to the science and use the results of research on epigenetics of anadromy?"

Meanwhile in our efforts to re-establish a healthy anadromous steelhead population, we note that one of the key determinants in defining suitable source populations for outbreeding are the congruencies of temperature profiles. By this time, Davis Hydro's temperature/ flow model[31] of the watershed should be complete and parameterized with sets of coefficients. The stream-flow/temperature modeling model will address:

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[30] The paucity of references in this area in stark contrast to the more exploding research of the more nascent field of epigenetics. This is because of the huge possibility of controlling the genetic message we are all born with. That is driving the research from obesity to disease remediation is all field of human medicine. If we are luck, we will learn from the exploration of the human model for way we can help the fish.

[31] Davis Hydro has had a temperature study underway since the spring of 2010 measuring water temperatures in 10 locations in the Old/South Cow Creek watershed.

- Outflow past all points at varying hydropower flows,
- Statistics of temperature for all points,
- Typical, high low and extreme low flow model hydrographs, and
- Statistics on various high flows - for habitat access modeling.

These data will be the starting point for defining what are the potential source populations for outbreeding.

The ongoing Old Cow DH gravel structure and composition study[32] will be integrated with the flow model to make a coherent sediment transport model – matrix prediction model. The streamflow-sediment models will address spawning matrix quality, availability, and stability as predictors of a stream fecundity model. This will help us predict the best locations of spawning gravel for later inoculation.

Year 2

During this second year, we hope to make progress on three fronts: genetics, epigenetics, and habitat improvements. Genetically, we need to map out a re-introduction plan that will be considered for competitively displacing, outbreeding, or partially replacing the existing trout. It is unlikely that many of the resident-adapted rainbow trout in the main stem of the Old Cow will be useful in reestablishing a population that can grow into a healthy diverse population in a reasonable time. This is research in direct support of the reintroduction or more generally re-establishment of anadromy in the upper Sacramento River.

The early results of the epigenetic studies might be giving us some indication of the imprinting mechanism – or if not the mechanism, more likely when and how anadromy can be imprinted on the epigenome, and perhaps we can pull out of the literature, how to best use that information.

Habitat Improvements: Habitat improvements encompasses a full range of activities from community outreach to identifying the best spawning grounds to inseminate given whatever source geo-adapted are found to be most suitable. Locally, it is hoped that during year one and two local ranchers will be contacted to see if some joint projects could be started.

On matching incoming exogenous anadromous genotypes to matched spawning grounds, we hope that the models will be helpful, and applicable. Even if incomplete – and they will be, the models will sponsor asking the right questions about which fish should do well where on the Sacramento.

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[32] DH also has been sampling spawning gravels since early 2010 for particle size analysis. This work in ongoing, and intended to give a picture of the spawning gravels in the area. Sediment transport and resulting structure is dependent on water and stream conditions. We are studying both the composition and structures of the gravels. This survey work, as we learn how to do it efficiently in the field, will become a tool for identifying the best future spawning grounds up and down the Sacramento tributaries. We also hope to be able to identify beds and to match the physical characteristics these beds with those source populations are familiar with. The question this work addresses, is given that we might acquire fresh exogenous anadromous brood stock, which should we choose familiar with soil structures, and where are the target spawning beds we want to inseminate with future anadromous progeny. To identify those locations DH has started to develop an understanding of statistical spawning bed fertility in the uncertain and dynamic nature riverbed environments.

Outreach – Beyond the Cow: Possible micro-spawning beds are found in many small creeks up and down the Sacramento River. To examine these for temperatures, pollution, and gravel, DH personnel are arrested for trespassing while checking out the results of the gravel prediction model.

Kilarc canal activities: There may be independently funded research project starting up in the headrace, and experimental production beds, screens and netting projects will start – possibly mostly in-house by Davis Hydro if outside funding cannot be found.

Year 3

During the third year, revenue from Kilarc hydro operations is expected to be significant and can provide funds for on and offsite projects. Onsite projects will be worked out with Davis Hydro – offsite projects will started be under the direction and funding of the Foundation. Any identification of what these might be is purely speculative.

Hopefully, some off-site ranch projects have been identified for collaborative arrangements, such as conservation easements, fencing, diversion improvements, or irrigation managements systems. Up and down the Northern Sacramento River DH has identified a series of small unscreened diversions for action. These are targeted for community based fish return screens and programs.

Research: Davis Hydro will continue its own agenda of research on informal screening, spawning bed cover and hydrodynamics, and other projects in the canal – hopefully in cooperation and under the direction of some local academic research institution.

Davis Hydro in collaboration with CDFG continues inseminating carefully chosen remote micro spawning beds with non-hatchery trout to improve genetic mix up and down the Sacramento. The timing of these planting has been determined in research, and the seed trout bred from robust epialleles pre-imprinted with anadromous tendencies from prior generations.

Year N

In this year, the Kilarc Project continues operation of the facility is approved by the resource agencies, and is no longer probational. PG&E surrender is accepted by FERC pending approval of a new license by FERC and acceptance of all Forthcoming License conditions by all agencies. Davis Hydro applies for a new license with prior agreements of license conditions agreements in-place with all agencies.

In this year, Davis Hydro will be operating small research projects in the canal and directly involved with co-funding small research projects related directly to its operation. Its operators will also be under contract to provide diversion maintenance services and perhaps ditchwalker services regulating irrigation water to provide just enough water to meet all needs with no field runoff.

The Kilarc Foundation is receiving about $ 87,000 dollars this year form the Kilarc Project. About 25 percent of this is matched by grants for various projects and conservation easements. This year there was a $ 5,000 deduction made from the Foundations support because it preferred to have flows in the headrace changes in various manners for experimental design. The experimenters were designed so as not to conflict with Davis Hydro's fry diversification and propagation efforts also in the canal. They were not completely successful.

Motorcyclists were caught on the security/wildlife TV cameras running their motorcycles through some research spawning beds.

Davis Hydro is again sued by Sierra Pacific or other farm or resource companies for inseminating streams in Placer County with anadromous trout. Having anadromous trout in a stream has led forest practices to be modified because of anadromy in the streams and a loss of revenue.

Year M

With Dr. Ely in his 80's and the Foundation not listening to a word of his suggestions, Davis Hydro sells its interest in the Kilarc Project to a new owner/operator. The license transfer is approved by the FERC. This is the same year that PG&E no longer has any obligations for facility removal should the Davis Hydro plan fail. Up until this point, PG&E has been very cooperative in that assisting the Kilarc project succeed perhaps because it fosters community relations, helps the natural resources, provides green power, and saves the ratepayers the expense of facilities removal with its attendant lawsuits.

The number of trout now in the Sacramento River is increasing the number of lamprey, which prey on them. NMFS is shifting its focus from anadromous Salmonids to sturgeon. DH offers to construct a sturgeon diversion passage research lab near the confluence of the Old and South Cow. The ranchers in this area are anxious to help with the project.

A DH contractor is sued for trespassing while dumping anadromous trout fingerlings in small streams further down Sacramento River.

Scenario I Conclusion

If we take some steps out lined here based on the evolving restoration sciences, we believe we will be good position to help the fish. How we do that will primarily up the Kilarc Foundation. The Foundation will command when and how much of the surplus resources of the project should be spent. Clearly this scenario is required the work of all who want to see the fish restored. We seek their ideas on ways to make it possible.

An Alternative Scenario II – PG&E sells the Kilarc Site

For Amusement and consideration, we now provide another (shorter) Scenario.

In this scenario, PG&E is allowed to sell its interest in the Kilarc site for terms that include providing a remediation bond or similar instrument to remove the site should the purchaser request it. This was a condition imposed by the FERC for the sale. In this scenario, the purchaser is the Kilarc Foundation. The Foundation has the obligation to spend about 100% of its income on fish enhancement projects. The Foundation leases the hydropower facilities to Davis Hydro for 30 % of the profits of operation, along with various commitments that allow for continuation of successful fish production and other research to continue with small amounts of support from the Lessee and continued use of various other facilities such as the lab and data links.

There are many variations, dependent almost entirely on what the more constrained participants want to do, and how we can best structure a long term entity that will best serve the community and the fish resources.

In this Scenario, the Foundation is the lead actor, and the lessor. Davis Hydro operates and maintains the hydropower site as lessee. Since the control is with the Foundation, and the Foundation has a mandate to protect the fish resources and the community, all objectives are served for the long term. The actions under this hypothetical scenario are as follows:

Year 1:
The Kilarc Foundation buys the site and a remediation bond callable for ten years from PG&E. FERC and the fish agencies approve the transfer since this will resolve all outstanding objectives on the Kilarc site. The license remains with PG&E for the time being. They are to hold the license until surrender that will, with the help of PG&E, create a strong functioning entity to support he community and the fish.

When it is clear that this will work, and a solution is found for the South Cow issues, the Surrender can be completed in the interests of all parties. PG&E again has every incentive to cooperate in that it wants the Foundation to succeed in its objectives so that it will not have its bond called and removal all the facilities. The agencies will cooperate in that they will acquire permanent funded community partner in fish restoration and habitat enhancement.

In year 1, the relationship between all the parties is agreed to and implemented. Since the PG&E license is still operative and there is – in effect a new operator, there need be no break in power generation or community services. However, what will change will be a rededication of the facilities and all actors into a completely different formation.

In Year 1 and 2, we will have to be rebuilding the facility with new controls, interconnections and infrastructure to function as a non-utility generator on the PG&E system.

On the environmental side, The Foundation will be working the DH staff to build the lab, rebuild the headrace, and make other changes to the facility to carry out its fish production, research, and fund generation agendas.

In Year 3 This year there are significant profits to start funding projects of the Foundation independently of Davis Hydro. As the funds were limited, tree planting in the headrace was started, summer work on fencing a ranch was started and proposals have been written for match funding for some research work.

Year N Approximately year 5-6, PG&E will surrender their license, and a new one will be issued to DH or the Foundation.

Note again, the these ideas are presented not as final work pieces, but rather as templates that suggest what is possible with cooperation and focusing on what is best for the future rather than what has been said in the past when the options were different.

Appendix 8 A Comparison of Alternatives

This is brief summary of the arguments. For a more complete historic dialog filed with the FERC as well as supporting documentation, please see the references in Appendix 9.

Old Cow Habitat Changes

With the PG&E's demolition Alternative to continued operation of the Kilarc facility, the increased flow down the Old Cow would increase habitat in the bypass area and a lowering of temperature in the lower parts of the bypass above the powerhouse. This increased in mixed habitat would allow more fish to be sustained in that area[33]. In the short run, the eco-system services provided by the created environment do indeed detract somewhat – especially in the summer, from the narrow isolated confines of the Old Cow Canyon.

The habitat created by returning water to the Old Cow reach might easily sustain more fish, but these fish would be descendants of the fish in the area. Currently, there are some small trout in the area[34], which most likely are the result of downstream emissions of the inbred resident population[35] of rainbow in the area from years of planting up at Buckhorn Lake. Irrespective their origin, these fish are not anadromous, and any epiallelic tendencies to this end have long been eroded by residence-survival imprinting.

This resident encoded population then would, and may forever, overwhelm upward anadromous fish as the numbers will always vastly favor the locally adapted fish. This means that to the extent we improve the Old Cow habitat, the more "resident adapted[36]" fish would be produced. If and as population pressures in the reach mount, some juveniles would drift downstream to below the various barriers in the Old Cow and compete with anadromous fish of several species in Cow Creek and the Sacramento. In summary, the probable effect on anadromy from increasing flow in the Old Cow might be to increase the habitat in this narrow channel, but to the extent that it is successful in increasing *O. mykiss* population the more the area will emit downstream resident-adapted fish putting competitive pressure on any downstream anadromous fish downstream.

Effect on Downstream Habitat

As outlined by Thompson, in the summer, temperature is the major determinant of habitat in the Cow Creek. The Cow in particular, and the South and Old Cow – have large areas that could become better habitat areas with plantings, pollution moderation and temperature lowering. If water is removed from the Kilarc facility and put into the stream, it will be warmer when gets below the power house than the water coming through the turbines. The cold is primarily

[33] Numbers of fish are indefinite here, but it should be clear from existing surveys, fishermen's reports, and that an estimate of less that 10 fish increase would not be unrealistic.
[34] Recent (1990's) electrofishing study in the area below the powerhouse for the Olsen Hydro project found some juvenile fish. No adults.
[35] Trout are prevalent upstream of the Kilarc Diversion up to Buckhorn Lake. (ref: Personal report CDFG, local fishermen, and CDFG report from personal observation)
[36] This is also expressed as: *resident ecotype*, or *resident phenotype*.

because of the speed of delivery from the cool waters through the high shaded position of the headrace, and in a minor way due to the cooling physics of hydropower[37].

This means that if water is returned to the Old Cow, the new aggregate water coming down the bypass will be warmer in the lower Old Cow and warmer to a lesser extent in the Cow itself in the summer. Since habitat in this area is both spatially and temporarily defined by temperatures (Thompson), anything that can be done to reduce water temperature extends downstream habitat both spatially and temporally through the year. Further, the hydropower water is especially cooler in the summer. This cooler water lessens the extreme and inverted temperature difference between the Cow Creek and the main stem of the Sacramento River caused by low-level releases from Shasta dam. Since this temperature regime is unnatural, reducing the temperature difference may help imported and outbred alleles adapt to local conditions.

Possible Conclusion on effects in the Bypass

Given the small area of habitat that in increased in the bypassed region of the Old Cow, and the much larger area and accessible that with be affected by the small decrease in temperature from the operation of the Kilarc hydro plant, it is probable that there will be significant decrease in total local habitat, and thermal stress on all the fish in the Cow in the summer. Habitat area is one measure, but it is important to note that the lower Old Cow and the Cow itself currently have anadromous fish present in several species quite unlike the upper Old Cow[38]. These all will be negatively affected with certainty by the small increase in summer temperatures.

Widespread Habitat Changes

The destruction of this green power resource will have tiny but widespread consequences in terms of changes in Western United States generation for decades into the future. Since virtually none of the needed local, national, or global green house gas emission targets are being met (other than promises on paper), the demolition of this facility will speed the increase in global temperature rise due to the implicit continuance of reliance on fossil generation.[39]

One can argue that California should not be bearing the huge cost Green power since we are now contracting for between $ 0.10 and $ 0.20/kWh for future green power. In this case, choosing the DH Kilarc Project Alternative will save California millions of dollars from not having to tear it down, pay the high prices for replacement green power – were it available. Nor will we bear

[37] It is colder for reasons of physics, also. This effect can be understood by noting that a lot of energy is removed from the water through the export of electricity, rather than the stirring if the water as it comes downstream.
[38] Based on all known observations, and as reported in the study for Synergics, owners of Olsen hydro just below the Kilarc powerhouse. The highest anadromous fish have been seen in the Old Cow is below the Lower Whitmore Falls, "several years ago" source: abutting ranchers.
[39] If this green power site is demolished, the continents will warm from these and other emissions, and fish like the steelhead are driven further north. There they will encounter less fishing pressure and an increasing land mass simply because of the large masses and clean rivers of Siberia and Canada. Thus, the warming effects of demolishing green power sources may be less than positive locally, but in the larger land masses, cold north, good habitat is opening and easily expanding. Using this logic, one can see why support for demolishing green generation facilities is strongly supported for the benefit of these fish.

the economic social and environmental costs of engaging in destructive enterprise to make up for the lost recreation, fire, community, handicapped, and ecosystem services[40].

Widespread Effects

While the consequential global warming may or may not be good for these fish globally, any gains must be balanced against the loss of habitat and fish by the acid rains from the fossil fuels that will be burned over the next few years. The poor buffering of the waters inland from this site in California and to a less extent across our country exacerbate the acidification effect and makes pH sensitive fish vulnerable to the acid rains resulting directly and indirectly from the incremental diminution of green electrical generation. In summary, all downwind fish will be affected by the acid and heavy metals from the replacement fossil generation.

Separately, since the Kilarc facility already exists, the demolition of this facility and the construction of its alternatives will have economic and therefore environmental effects throughout the economy. These effects will have large multipliers due to the *de novo* construction and lack of substitution effects. These construction, demolition, and economic multiplier effects will be subtle, secular, and of a magnitude that may be far in excess of all other effects combined on the global fish resources.

The global effects are not only on fresh water fish, but the destruction of green resources, is rapidly acidifying the oceans reducing all fish not adapted to more acid conditions – for example all reef fish who are rapidly losing reefs on which to feed. While we cannot assume that local agencies include these effects in their evaluation, it is hopes that National Agencies have a broader domain for their calculus. The national and global effects of the contemplated demolition of green energy production will have small but devastating incremental widespread consequences. This is perhaps one of the clearest examples of thinking locally and destroying globally.

Finally, and briefly there are substitution of demand effects that will lead to negative impacts of fish. These include and increase in fire in the area with the loss of the Kilarc reservoir and a decrease in anadromous fish in the Cow and other Rivers nearby because of anadromous fishing pressure from fishermen who can no longer fish at the put and take fishing in the Kilarc Reservoir.

Genetic Diversity

Background

Hatcheries are wonderful at producing many millions of fry from a limited number of adults. The results of this are a collapse of the genetic diversity in any geographic area. Further, the descendants are related in numerous ways so that stealth inbreeding occurs among many more

[40] For further discussion of the detrimental effect of handicapped fishing, increased pollution from travel, and a host of secondary, indirect, and multiplier effects see the DH filings in Appendix 9.

cousins than just genetic siblings. This collapsed gene pool leads to "genetic depression" which results a general failure of physical and perhaps cognitive functioning (Frankham).[41]

This specific genetic collapse is documented in California is now well documented in the CDFG Hatchery Report (CDFG). This report shows the destruction on a plenary level the effect of hatchery practices on *O. mykiss* Sacramento River stock. What the otherwise excellent report fails to do is to address adequately what can be done to restore diversity other than stopping their current practice of dumping hatchery fish to compete with possibly anadromous ones. This is limited step is being done, and in effect our efforts will pick up from there.

Why is genetic diversity important? Anadromy has little to do with genetics beyond supplying a robust and genetically diverse population. However, this robust genetic base is crucial for the population to be stable enough to do at least four things – all of which are necessary for the future not only of the species but also for subgroup that becomes anadromous. Genetic diversity provides:

- A genetic spectrum of genotypes from which evolution can happen,
- Enough variability to respond to any long term changes in environment,
- Protection form inbreeding failure with such manifestations a functional and physical failures to achieve potential, and most important for this discussion, and
- A spectrum of genotypes that can present slightly different genomes onto which an anadromous epialleles can be formed by the environment.

The adaptive behavior we seek, anadromy, is representative of a myriad of behaviors this fish adopts in various settings. Anadromy is the poster child of a healthy trout population who have access to the sea. It represents, not just the most sought after form of *O. mykiss*, but it indicates a healthy population supporting this behavior.

The Do-Nothing Conundrum

Any Alternative that leaves the current population in place will rely primarily on the existing resident-adapted inbred fish. This genetically narrow population provides as obstacle to the creation and establishment of a healthy genetically diverse genome base. This will inhibit and delay population restoration efforts since a healthy diverse genetic base is needed for stable imprinting of anadromy.

The Demolition Alternative

The removal of the Kilarc facility may increase the prevalence of the resident ecotype of O. *mykiss* in the area of the Kilarc bypass. This population increase will lead to an increase in emission of trout juveniles downstream giving the appearance of an improving fish population. This is both counterproductive and bad biology. However, due to the saturation of the local area with hatchery fish, and subsequent years of adaptation/selection to a resident lifestyle, any population count is misleading. Most likely, there may be far fewer genetically (or epigenetically) different fish than appear. Further, even the fish from different parents – i.e. non-brother and

[41] This is often proxied as size attainment, fecundity, or disease resistance as in human functional metrology.

sisters may be close cousins due to earlier inbreeding. It is possible that to foster a healthy population, most of the local fish will need to be eliminated in order for there to be room in an ecosystem for a genetically diverse population to come into being in a reasonable amount of time.

In summary, the Demolition Alternative will have no known positive effects on the development of a prevalence of the anadromous epiallele. The demolition Alternative leads to very slow increase in the number of different genotypes that will be present with inbreeding small populations with significant inbreeding. The limited number of different anadromous phenotypes compounds this depressive effect.

The Kilarc Project

Alternatively, under the DH proposal an active program will, find the best genotypes for outbreeding local fish with; DH will work to create a multitude of small micro-geoadapted populations with the allelic predilection for imprinting for anadromy for small insemination locations throughout the upper Sacramento River. This will be done over years of carefully balancing local fish and outbreeding with genetically distant populations that contains a significant percentage of anadromous individuals that are familiar with conditions we find at potential micro-spawning grounds.

Outbreeding has to be done in a carefully so as to preserves whatever coping mechanisms the local alleles have concentrated. These might include resistance to local physical, chemical, food predatory conditions, and/or diseases. This is not simple, in that almost none of these compatibility issues can be evaluated without trying it little of this is directly measurable[42] and we have started looking at those variables. What is worth saving in the local Sacramento genotype has to be carried by the limited genetic population, and balanced against not only the benefits of imported alleles, but also of the effects on possible out-breeding depression, lack of local coping adoptions[43], genetic mismatches[44], and diseases.

Discussion

Finally, there is as yet, no way to measure many of the outcome features or numbers of interbreeding fish with these important input genes and epiallelic factors in less than a reasonable number of generations. Any poor data on the important features of the existing parent populations makes epiallelic husbandry *ex post* analysis difficult. It is made more complex by the dynamic instability of the target and perhaps source environments. Measures confounding any analyses of programmatic efficacy include stochastic weather, varying tributaries, predators, and perverse temperature regimes that will be faced by any fish brought into the region.

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[42] See the discussion in footnote 31and 32 for what we can measure. Further, many studies have been made of diseases of both most potential source diseases and diseases prevalent in potential target areas of the Sacramento.
[43] Anadromy along with migration in birds and mammals are examples of a local, transient, adaptive coping strategy.
[44] Just because two individuals can mate, and probably, by human selection, carry preferred alleles, it does not mean that they will be fecund (the mule is an example), or the offspring healthy (the local disease resistance may be overwhelmed or replaced by other allelic imprints) or viable.

Appendix 9 Davis Hydro Filings and Sources

Version 3.4a Dated June, 2010

This abbreviated bibliography contains some of the filings of Davis Hydro and the responses of the Review Agencies. Here is presented the ideas and background for June 2010. To see a more (to our knowledge, complete and up to date) list, please visit http://kilarc.info/Docs_Maps_Drawings/Docs_Maps_Drawings.htm.

The files included here either by us or by the Agencies are not comprehensive but are intended to be fully representative. Files that are not here include:

- Unofficial e-mails with agency staff and consultants,
- Notes on telephone calls with various parties, and
- Early filings and agency inquiries.

There are few references to the Tetrick Proposal. These documents are available on our WEB site at or the FERC WEB site.

DOCUMENTS

The following documents are in order with the more recent ones at the top. There are earlier ones not included here (see "older Filings" below), but these are a snapshot of our involvement. Each has a brief annotation.

The following is Davis Hydro Comments on the Requested Scope for the EIS (FERC dated 10-25-09). This is important in that it addresses again the breadth of the issues to be addressed in an environmental analysis. This paper does not discuss or describe our proposal directly. http://kilarc.info/Docs_Maps_Drawings/Documents/KC0495%20%20DH%20Scoping%20Filing%20(Replacement)%20and%20Errata_20091026-5005(22727524).pdf .

Below is our response to CDFG comments. - We agree!! with CDFG's concerns, but disagree with their conclusions (February 3, 2010). This is an important paper in that a response to the only comprehensive agency response to the Davis Hydro Alternative. http://kilarc.info/Docs_Maps_Drawings/Documents/KC0537%20DH%20Response%20to%20CDFG%2020100203DHon.pdf.

CDFG's December 10, 2009 response to our June 2009 proposal. In summary, they found it "very experimental, different, and untested" (see page 2) http://kilarc.info/Docs_Maps_Drawings/Documents/KC0507%20%20CDFG%20comments%20on%20Scoping%20Process%20-neg%2020091228-0038(23231988).pdf

Below is our August 24, 2009 comprehensive response to earlier NOAA FWS & CDFG comments on the scope of the Environmental Impact Statement as then defined by FERC. We

suggest that as presented, the scope is far too narrow to comply with the goals of the agencies. This document is not a description of The Davis Hydro Alternative, only discussion of the EIS Scope.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0466_Davis%20Hydros%20Comprehensive%20ReplyComments.pdf.

Davis Hydro. 2009b. Project Scope and Studies. Davis Hydro Working Paper, K-4. Davis, CA. July 12, 2009. This described the important scoping variables to be addressed in and Environmental Impact Statement. It is available at:
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0460_Davis_Hydro_Supplemental_20090713-5112(22071630).pdf. FERC Accession No. 20090713-5165.

The (June 2010) Davis Hydro Alternative
The following are found in the FERC eLibrary filed under P-606: FERC Accession No. 20090619-5008 Davis Hydro. 2009a. The Kilarc Steelhead Project. **An Alternative to the Demolition of the Kilarc Hydropower Project.** Davis, CA. June 2009. Also available at:
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0432_Davis_Hydro_Alternative_20090619-5008(20985259).pdf. FERC Accession No. 20090713-5112.

NMFS comments on the June 8 2009 DH Alternative.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0342%20NMFS%20Comments-P-606-4Aug08.pdf.

These NMFS refer to earlier November 2005 comments, on a much earlier and quite different, Synergics proposal. These NMFS comments call for a large number of studies and that will delay progress for many years. These comments are important because they show where NMFS is on this project, and implicitly why Synergics and PG&E abandon the project. The earlier NMFS comments are available here:
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0044%20NMFS%20comments%20on%20IIS.pdf.

Davis Hydro's **June 8 2008 Reconstruction Alternative contained almost all of the present ideas**. It is available here:
http://kilarc.info/Docs_Maps_Drawings/Documents/Alternative_1_June_20_2008/KC0336j%20Completete_June20.pdf.

Older Filings

There is also a previous version dated April 2008, included the South Cow improvements. There are earlier versions and versions that also addressed work on the South Cow, but the South Cow objective was separated due to realization that the valuable upstream habitat needed to be restored and that the Abbott Ditch water deliveries provided a key means of protecting downward migrating fish, if ranchers permitted it.

Other Supporting Documents and Maps

In January 2010, DH released an updated Salmonid discussion paper of research topics we wish to undertake. This has not been discussed with the agencies, so it is not included above. It is available here and as we learn more, it is being updated.

The following document discusses why the local BIG Timber company opposes our proposal. It also briefly addresses our solution to the Abbott Ditch problem on the South Cow. It does not comment significantly on the Tetrick Settlement Proposal.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0541%20DH_Comments_on_Tetrick_Settlement_Inputs_20100205-5007(23419948)[1].pdf.

The following is a NMFS response to proposal (October 15, 2009). This is very brief and contains little.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0482%20NMFS_10-15-09_comments_20091016-5005(22664858)[1].pdf .

Tetrick motion to intervene, outlining his Alternative is at
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0458_Tetrick_Alternative_20090713-5165(22073407).pdf

All documents filed with the FERC on this Docket are available at the FERC Web Site at http://www.ferc.gov/docs-filing/elibrary.asp.

Others – some early news articles, and perhaps simpler to access to most documents are available from Davis Hydro at
http://kilarc.info/Docs_Maps_Drawings/Documents/docs.htm.

Davis Hydro Kilarc Project Maps are primarily included in:
http://kilarc.info/Docs_Maps_Drawings/Maps/Maps.htm.

Non Davis Hydro Kilarc Project Maps are primarily included in
http://kilarc.info/Docs_Maps_Drawings/Maps/Drawings.htm.

Photographs of the Kilarc site are available from Davis Hydro at:
http://kilarc.info/Pictures/pictures.htm.

Local Community Website with news releases and other community filings is available at http://savekilarc.org. {KC LLC has helped the Community Web sites from time to time.}

PG&&E is providing some of their larger documents, environmental reports, and response to the FERC's additional information request (AIR) filings at: http://www.kilarccowcreek.com/default.aspx . The latest AIR data are currently only available at the FERC WEB site or as a CD from PG&E.

Additional Sources Providing Context for Analysis

Presentation by Desiree D. Tullos, California Water Board, July 23, 2007, "The Science and Practice of Restoration - Ghosts of Rivers Past, Present, and Future" slides available at http://kilarc.info/Docs_Maps_Drawings/Documents/KC0262%20Tullos_Deseree_Stream%20Restoration%20July%202007.pdf .

FERC Accession No. 20070731-5001
Davis Hydro's Scoping Paper on the Kilarc and South Cow License Surrender Study Plans. This paper suggested Project Surrender Alternatives and Derived Recommended Studies Presented to FERC P-606 Stakeholders including The Save Kilarc committee, The Friends of Cow Creek Preserve, The Cow Creek Watershed Management Group, Associated Ranchers and Water Rights Holders, and The People of Greater Whitmore Draft for Comment and Consideration, July 2007 by Davis Hydro, from which both the Tetrick and Davis Hydro alternatives have evolved.

http://kilarc.info/Docs_Maps_Drawings/Documents/KC0235%20Davis%20Hydro%20Scoping%20Study%20Plan%20Draft%20II.pdf.

FERC Accession Nos. 20070427-5112, 20070517-0080 and 20070531-3003
Notification of Intent to Seek A New License for FERC Project No. 606 Kilarc-Cow Creek of Davis Hydro LLC
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0070%20KC%20LLC%20%20NOI.pdf
and this was denied by the FERC.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0170%20FERC%20rejection%20of%20request%20to%20hold%20for%20filing%20of%20NOI.pdf.
This was preceded by Letter of Davis Hydro to FERC General Counsel Re: Future Licensing Options and Priority for FERC Project No. 606 Kilarc-Cow Creek (not available on eLibrary, but only at link below)
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0060%20FERC%20General%20Counsel.pdf.

Kilarc Project Related Environmental Studies

Hatchery and Stocking Program EIR/EIS California Fish and Game. This document and associated studies address the very issues raised by Davis Hydro in their Kilarc Proposal. That is the issue of genetics. This document is very large and exhaustive but addresses comprehensively the problem that the whole area is perfused with hatchery fish and now we must do something about it. The resolution of this issue is addressed at length in the genetic issues and direction outlined in the Davis Hydro Alternative. Their study is available here: http://www.dfg.ca.gov/news/pubnotice/hatchery/.

PG&E's Biological Assessment (Internal Draft) August 2009, Available from FERC – Elibrary as Pacific Gas and Electric Company (PG&E). 2007. Kilarc-Cow Creek Project, FERC No. 606, Aquatic Habitat and Fisheries Resource Report. Prepared by Entrix, Inc., Concord, CA. November 2. Available at:
20091026-5005 FERC PDF (Unofficial) 10/25/2009 10:28:01 PM
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0328 Aquatic Habitat from PG&E Dec4 2007.pdf .

Cow Creek Final Watershed Assessment 2001.This is available at http://kilarc.info/Docs_Maps_Drawings/Documents/KC0007%20Cow%20Creek%20Final%20Watershed%20Assessment%202001.pdf. It is 25 Megabytes.

Regarding temperature effects on Salmonid habitats in northern California, see Thompson, Lisa C., Larry Forero, Yukako Sado, and Kenneth W. Tate, *Impact of Environmental Factors on Fish Distribution Assessed in Rangeland Streams* in California Agriculture, Volume 60, Number 4, pp. 200-206.
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0090%20Lisa%20Thompson_Paper_Impact%20on%20Fish.pdf. and
http://kilarc.info/Docs_Maps_Drawings/Documents/KC0260%20Thompson_Lisa_%20July_2007_Restoration_Paper.pdf. "Stream Ecology from a Fish's Perspective: Habitat, Connectivity, and Flow" – a collection of 57 slides presented by Lisa Thompson and to be filed shortly on the FERC eLibrary under P-606 for reference in this proceeding.

Studies commissioned by Davis Hydro, from which both the Tetrick and Davis Hydro alternatives have evolved, include:
FERC Accession No. 20080707-5045 (4 documents found at pages 25-41 of FERC-generated pdf).

An exploratory paper written by the Environmental Ecologist: Ms. Ayako Ohara's (ne: Kawabata) , "Feasibility of a Fish Production Facility in the Kilarc Canal, A Field Report, June 2008" available at
http://kilarc.info/Docs_Maps_Drawings/Documents/Alternative_1_June_20_2008/KC0336k%20Research_papers.pdf.

Davis Hydro Commissioned a brief review of our proposals as they were developing. Cramer Fish Sciences (Joseph Merz & Bradley Cavallo), "Fishery evaluation for South, Old Cow Creek Hydroelectric Facilities" available at http://kilarc.info/Docs_Maps_Drawings/Documents/Alternative_1_June_20_2008/KC0336f%20Cavallo%20Fish%20Biologist%20Report%20043008.pdf

StreamWise Stream Assessment and Restoration (Rick Poore) reviewed the possibility and the work required to make nature like spawning beds in the headrace. "Observations made during our April 2, 2008 site visit to the South Cow Creek (Tetrick Ranch) and Old Cow Creek (Kilarc) project areas" available at http://kilarc.info/Docs_Maps_Drawings/Documents/Alternative_1_June_20_2008/KC0336g%20Poore%20Restoration%20assessment.doc

Todd Sloat Biological Consulting, Inc. "Summary of observations made on 2 April 2008, at the Kilarc project area" available at http://kilarc.info/Docs_Maps_Drawings/Documents/Alternative_1_June_20_2008/KC0336h%20Sloat%20Endangered%20Species%20Winter%20Report%204-14-08.doc.

MAPS

To start: A good overview Map of the Headrace/spawning grounds is here: http://kilarc.info/Docs_Maps_Drawings/Maps/Other%20Maps/Figure_1_Labled_The_Kilarc_Alternative.pdf

Davis Hydro and PG&E maps at various resolutions are available from Davis Hydro at: http://kilarc.info/Docs_Maps_Drawings/Maps/Maps.htm.

In particular, electronic pdf versions of the GIS maps shared at the September 27, 2009 Second Annual Community Picnic at Kilarc Reservoir, that will also be distributed at the site visit and FERC scoping meetings next week, are found at the following links:

Figure 1 - The whole Kilarc canal showing major features http://kilarc.info/Docs_Maps_Drawings/Maps/Other%20Maps/Figure_1_Labled_The_Kilarc_Alternative.pdf.

Figure 2 - The section of the canal showing the first two Upper Spawning sections and fish return features. (not readily accessible from the picnic at the forebay) http://kilarc.info/Docs_Maps_Drawings/Maps/Other%20Maps/Figure_2_Labled_Alternative-Diversion_Area.pdf.

Figure 3 - The Lower Section of the canal showing the fish return options. http://kilarc.info/Docs_Maps_Drawings/Maps/Other%20Maps/Figure_3_Labled_Alternative-End_of_Study%20Area.pdf.

Forthcoming Data

Davis Hydro is in the process of developing and will supply GIS-located photographs of the entire Kilarc bypass taken every 50 to 75 meters. The photos focus on the falls, barriers, cover, and condition of the stream bottom. They include photographs of possible gold working artifacts from the Kilarc bypass region that are.

1. • Photographs of ospreys in the forebay and snakes eating fish in the Old Cow.
2. • GIS located gravel samples from the lower half of the Kilarc bypass.
3. • Mosaiced low altitude aerial high-resolution photographs of the Kilarc canal and bypassed Old Cow Creek.

Appendix 10 References

(with notes and partial abstracts)

Since this paper is not intended for scientific publication, comments, partial abstracts, and Web references have been added for transparency and access.

Araki H., Cooper B, Blouin MS. Genetic effects of captive breeding cause a rapid, cumulative fitness decline in the wild. Science.;318(5847):100-3, 2007
http://www.ncbi.nlm.nih.gov/pubmed/17916734?dopt=Abstract

Aubin-Horth, N., Landry, C., Letcher, H., and Hofmann, H. Alternative life histories shape brain gene expression profiles in male of the same population. Proceedings of the Royal Society B. 272, 1655-1662, 2005

Blouin, M. S., Virginie Thuillier, Becky Cooper, Vindhya Amarasinghe, Laura Cluzel, Hitoshi Araki, and Christoph Grunau
Note: No evidence for large differences in genomic methylation between wild and hatchery steelhead (Oncorhynchus *mykiss*) Can. J. Fish. Aquat. Sci. 67(2): 217–224 2010
http://rparticle.web-p.cisti.nrc.ca/rparticle/AbstractTemplateServlet?calyLang=eng&journal=cjfas&volume=67&year=0&issue=2&msno=f09-174

CDFG DFG Hatchery Operations Final DFG Environmental Impact Report (EIR) / Environmental Impact Statement (EIS) released January 11, 2010
http://www.dfg.ca.gov/news/pubnotice/hatchery/

Clemento, J., Eric C. Anderson, David Boughton, Derek Girman and John Carlos Garza Population genetic structure and ancestry of Oncorhynchus *mykiss* populations above and below dams in south-central California Anthony Conservation Genetics Volume 10, Number 5, 1321-1336, 2008
{Abstract: Genetic analyses of coastal Oncorhynchus *mykiss*, commonly known as steelhead/rainbow trout, at the southern extreme of their geographic range in California are used to evaluate ancestry and genetic relationships of populations both above and below large dams. Juvenile fish from 20 locations and strains of rainbow trout commonly planted in reservoirs in the five study basins were evaluated at 24 microsatellite loci. Phylogeographic trees and analysis of molecular variance demonstrated that populations within a basin, both above and below dams, were generally each other's closest relatives. Absence of hatchery fish or their progeny in the tributaries above dams indicates that they are not commonly spawning and that above-barrier fish are descended from coastal steelhead trapped at dam construction. Finally, no genetic basis was found for the division

of populations from this region into two distinct biological groups, contrary to current classification under the US and California Endangered Species Acts.

Frankham, R., Ballou, J.D.,Briscoe, D.A. Introduction to Conservation Genetics, Cambridge University Press 2010. {Core study text}.

Garrett, I. D. Masters These Proposal Stream Environment Effects on Gene Expression: Developmental Plasticity and Life-History Strategies in Oncorhynchus *mykiss*. PORTLAND STATE UNIVERSITY 2010 http://web.pdx.edu/~justc/courses/GrantWriting/10GrantWritingDraft2/GarrettIan.pdf

Ho, D. H., W.W. Burggren, Epigenetics and transgenerational transfer: a physiological perspective The Journal of Experimental Biology 213, 3-16 2010 {An excellent plenary discussion of the transgenerational aspects of epigenetic field as of 2009}

Jaenish R, Bird A, Epigenetic regulation of gene expression How the genome integrates intrinsic and environmental signals. Nat. Gen. (Suppl.) 33: 245–254. 2003

Kittilsen, S.; Schjolden, J; Beitnes-Johansen, I; Shaw, JC; Pottinger, TG; Sorensen, C; Braastad, BO; Bakken, M; Overli, O Melanin-based skin spots reflect stress responsiveness in Salmonid, Fish Hormones and Behavior [Horm. Behav.]. Vol. 56, no. 3, pp. 292-298. Sep 2009

{Shortened Abstract: ... Within animal populations, genetic, epigenetic and environmental factors interact to shape individual neuroendocrine and behavioral profiles, conferring variable vulnerability to stress and disease. ... Here we show that individual variation in stress responsiveness is reflected in the visual appearance of two species of teleost fish; rainbow trout (Oncorhynchus *mykiss*) and Atlantic salmon (Salmo salar). ... Taken together, these data demonstrate a heritable behavioural-physiological and morphological trait correlation that may be specific to alternative coping styles. This observation may illuminate the evolution of contrasting coping styles and behavioral syndromes, as occurrence of phenotypes in different environments and their response to selective pressures can be precisely and easily recorded.}

McPhee M. V, Utter F, Stanford JA, Kuzishchin KV, Savvaitova KA, Pavlov DS, Allendorf FW. Population structure and partial anadromy in Oncorhynchus *mykiss* from Kamchatka: relevance for conservation strategies around the Pacific Rim. Ecology of Freshwater Fish 2007: 16: 539–547. 2007 http://www.fishsciences.net/projects/yakima/_pdfs/McPhee-et_al_2007.pdf "... We found lower heterozygosity in Kamchatkan populations compared with North American populations, but population structure was substantial (region-

wide FST ¼ 0.11) and followed an isolation-by-distance pattern similar to that reported for older North American populations. We found no evidence for genetic divergence between resident and anadromous individuals in the Sopochnaya River or between typically anadromous individuals and 'half-pounders' in the Utkholok River. A review of other studies of reproductive isolation, in combination with our results, suggests: (1) that pristine populations of steelhead should be expected to exhibit partial anadromy; and (2) that managing anadromous and resident individuals separately without demonstrating reproductive isolation is biologically unsound."

Meghan L. M. Fuzzen, Sarah L. Alderman, Erin N. Bristow, Nicholas J. Bernier, Ontogeny of the corticotropin-releasing factor system in rainbow trout and differential effects of hypoxia on the endocrine and cellular stress responses during development, General and Comparative Endocrinology, In Press, Uncorrected Proof, Available online 2 December 2010, (http://www.sciencedirect.com/science/article/B6WG0-51M0N7B-2/2/a642e2bccda686bf3926a4fc17128bee)

Techniques to define: " Detection of anoxia-responsive genes in cultured cells of the rainbow trout Oncorhynchus *mykiss* (Walbaum), using an optimized, genome-wide oligoarray The breadth of mechanistic analyses of environmental stress responses is greatly enhanced by the use of contemporary post-genomic screening technologies, notably including massively parallel transcript analysis by microarray. These genome-wide investigations are entirely dependent upon the creation of a suite of resources that are directed against the species under investigation. Here, the authors describe the use of in silico techniques ..."

Olsen, J. B. Wuttig, K. Fleming, D. Kretschmer, E. J. Wenburg, J. K. Evidence of partial anadromy and resident-form dispersal bias on a fine scale in populations of Oncorhynchus *mykiss* CONSERVATION GENETICS Bibliographic details, VOL 7; NUMBER 4, pages 613-619 2006
" Data from 13 microsatellite loci reveal no genetic difference between sympatric steelhead and resident *O. mykiss* but moderate population structure (F ST=0.0190.028) between adjacent samples, regardless of life history type. Our results provide further evidence of partial anadromy and suggest that geographic proximity and genetic history, more than migratory type, should be considered when identifying populations for use in restoration..."

Pavlov D. S., On the problem of ratio of Anadromy and residence in salmonids (Salmonidae) Journal of Ichthyology Volume 48, Number 9, 778-791 Jan 1, 2008

Pavlov, D. S., Savvaitova, K.A. & Kuzishchin, K.V. Epigenetic variations of life history strategies in Red Data Book species – *mykiss* (Parasalmo *mykiss* (Walb.)) to the problem of species conservation. Doklady Biological Sciences 367: 709–713 (translated from the Russian). 1999.

Thompson, L. C., L. Forero, Y. Sado, K.W. Tate, Impact of Environmental factors on fish distribution assessed in rangeland streams, California Agriculture, 60 (4) Oct 2007

Wilson, E.O. Sociobiology: The New Synthesis, 1978, Belknap Press of Harvard U. Press {The Seminal work, along with On human Nature, were the seminal works relating genetic encoding to behavior. While an eminent biologist he did not pursue mechanisms of encoding, nor had science then admitted the existence of the epigenome.}

A Comment

on the

National Marine Fisheries Service's

February, 2011
Biological Opinion

on the

Kilarc-Cow Creek Hydroelectric Project

FERC Project P-606

March 22, 2011

By

Richard Ely

Davis Hydro, LLC
The Kilarc Foundation

March 14th 2011
Davis, California

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A Comment on the National Marine Fisheries Biological Opinion

by Richard Ely – Davis Hydro

Preface

FERC has asked the National Marine Fisheries Service (NMFS) to provide a Biological Opinion on the ESA impacts of FERC's preferred alternative for the disposition of FERC Project P-606. NMFS has complied with FERC's request. In this comment we hope that NMFS will consider it an opportunity not just to respond to FERC, but instead to do what is best for the fish. We ask NMFS in their response to these Comments, to take the opportunity to tell FERC that this project may have an alternative outcome that is better for the fish, the community, and possibly the planet.

Many of the points presented in this Comment have been made previously, over a three year period in numerous FERC filings. This Biological Opinion (BO), and FERC's parent draft NEPA EIS, may be inconsistent with substantial FERC-filed, physical, and logical evidence to the contrary, and therefore we request NMFS use this review to reconsider options available to it. We appeal to NMFS desire to help these fish, and not to bow to FERC's incomplete analysis, and therefore we have expanded our comments beyond they in necessary to minimally respond to FERC to address the far more important question of what can we do for the fish.

Davis Hydro, and its Kilarc Foundation, have presented an extensive set of long-term aggressive alternatives. We have provided plans for substantial actions that will help the fish, and have shown in previous filings how harmful the destruction of the Kilarc facility would be in this regard. This destruction is ignored in the BO, and NMFS appears to ignore the negative consequences of its decisions. Davis Hydro has outlined several general and specific ways that strong conservation plans could be implemented within Federal law and FERC practice, to benefit the fish. These plans would not cost any agency money or time, other than perhaps providing a representative director or advisor to the Kilarc Foundation. Examples of FERC-process-compliant implementation schemes were put forth last year, and this year, in discussion format in the Kilarc Project summary filed January 2011.

Finally, as we move towards the fourth year of counter-arguments, we are heavily conflicted by having to criticize work by the very agency we need as a partner. We would welcome the opportunity to work with any State or Federal Agency on this project.

Richard Ely,
March 2011

Executive Summary

The Biological Opinion (BO) concludes that PG&E's demolition alternative is not likely to jeopardize the continued existence of the listed species, or adversely modify critical habitat. It arrives at this conclusion by a selective review of some of the local effects of the project and ignoring most others – some of which are important.

It is unclear what the purpose of this BO is, other than to address the narrow Endangered Species Act question. Its purpose could be to open and explore data, and investigate alternative project outcomes to help the fish, but that path has not yet been chosen. Due to its incompleteness even on the narrow ESA issue addressed, this BO is not yet suitable for consideration in any NEPA/EIS or CEQA process. Separately, to the detriment of our environment, it does not yet serve the mandate of the agency by addressing the alternative proposals, and it has virtually no local environmental data or science behind the conclusions it came to on FERC's presented preferred alternative. It discusses of most of the factors that demolishing the green power source will inflict on the environment, but fails to include these negative effects in its invisible analysis. It ignores physical data and scientific analyses conflicting with the presented BO conclusions and presents no little local data or science of its own. Ignoring most negative effects of demolishing this green power source, NMFS concludes that its demolition will have no effect.

The BO does not consider that demolishing the facility will preclude the potential beneficial effects of its continued operation. By ignoring both its current beneficial effects, and the positive effects that would result from existing alternatives, the BO's supported demolition alternate deprives the listed species from all possible benefits that could flow from a carefully worked-out alternative of continued operation under appropriate terms. Detrimental effects include irretrievable and irrevocable impacts on resources, including:

- Increased fire impacts on critical habitat,
- Increased water temperature in critical habitat areas,
- Increased fishing pressure on known existing endangered populations,
- Construction effects of alternative power sources,
- Delay in green power expansion, and
- Delay in implementing any constructive alternatives.

Other probable direct effects are:

- Decreased funding for habitat restoration, and
- Decreased long term cooperation by ranchers.

While the BO has to address decommissioning, the effects on the listed resources could be examined under various possible dispositions of the project components. Davis Hydro has suggested for three years that the two projects be examined as separate components. The South Cow with its extensive known habitat areas is quite different from the Old Cow with its incised valleys and barrier falls. In one case, it makes sense to use the site to generate income

to improve habitat, but in the other it may not. By separating the project into viable and logical components within the rubric of the decommissioning alternative some of the many options that have been proposed by Davis Hydro for the Kilarc/Old Cow half of the project could be enabled as part of the cost of decommissioning. A complete analysis would look closely at the two different creeks and hydro sites under the FERC license and examine how these can be used for the best interest of the fish, the community and the planet.

Finally, this BO is deficient in that it may violate the Federal Data Quality Act, a recent presidential memo, and the Administrative Procedures Act. .

Davis Hydro Comments on the National Marine Fisheries Service Biological Opinion on the FERC Project 606 Demolition Alternative

Introduction

Without question, NMFS staff have devoted much time to this extensive compendium of status, reports and work that is being done to help the steelhead and salmon in California. This Comment focuses entirely on the Kilarc Project and says almost nothing about the South Cow part. If we are interested in helping the fish, we need to think of these two areas separately as the opportunities are very different. The impacts on ESA resources can be divided into irretrievable and irrevocable impacts on resources and other probable direct effects that are less tangible, but that will have a statistical impact on resource destruction. This comment concludes with a discussion of the incomplete analytical structure of the BO which erroneously infers causality in its conclusions, and finally addresses Federal data and study adequacy in the current regulatory environment.

Irretrievable and irrevocable physical impacts

Fire

The Reservoir

The Cow Creek Watershed has experienced several major fires in the last 30 years, plus numerous smaller fires each year that were caught in initial stages by aggressive fire suppression or otherwise restrained by less than perfect fire weather conditions. CAL FIRE records indicate a total of 42 wildfires have occurred within the planning area. Nine have been in excess of 3,000 acres. The two largest fires were the 1992 Fountain Fire of 65,300 acres and the 1999 Jones Fire of 26,020 acres[1].

The Kilarc Reservoir provides critical water at a perfect placement and altitude for fighting fires in the area. Removing this facility will put the local human population at risk, and will forever increase the prevalence of fires in the area. Anyone who has flown a helicopter knows that the Kilarc reservoir is perfectly placed to cover the valley around Whitmore, and its accessibility, proximity, and altitude make it an irreplaceable efficient fire fighting water source. There is no substitute.

Firebreaks

The Kilarc Project maintains access roads to and along the Kilarc Canal form important firebreaks. They are especially useful as firebreaks with the water supply available from the Kilarc reservoir at the right altitude. Further, with the canal full of water there is a near

[1] Cow Creek Strategic Fuels Reduction Plan Update Western Shasta Resource Conservation District 2010

infinite supply at access points along its length for trucks and fire fighters on the ridge. Finally, these firebreak and access roads are especially useful because the canal and its support roads run East-West[1] (cross-wind) and are well maintained for the hydro and associated recreation. Were this project demolished, the project roads would be abandoned. Others would revert to timber road maintenance and Miller Mountain Road maintenance would drop if the hydro were abandoned.

Effect of Fire

The effect of fires on fish is well documented. Fire is identified as a key threat in several places in NMFS Public Draft Central Valley Salmon and Steelhead Recovery Plan (CDSSRP)[2] . The amount, composition and toxicity of soil runoff and destruction of cover are among the effects that will extend downstream into critical habitat areas for numerous known anadromous species. This spiking sediment load and turbidity will be due to increased frequency, intensity and duration of hot fires. This has been brought to light in many filed documents and at every public hearing. Increasing the statistical prevalence of fire in this area conflicts with the Central Valley Salmon and Steelhead Recovery Plan and constitutes an irretrievable and irrevocable loss of critical habitat that will extend into the indefinite future.

In summary, the long term increased prevalence of fires from the removal of the reservoir, removal or diminishing the fire breaks, removal of the Kilarc Canal and reducing access road maintenance will decrease fire resistance in the immediate areas and decrease fire fighting ability over a wide area. This constitutes an annual "take" not only of habitat but statistically of fish directly. Since this effect was not included, this Biological Opinion (BO) is deficient and should be rejected.

Increased water temperature in critical habitat areas

It is documented in the filed record and public testimony that the water coming out of the Kilarc hydropower site is colder than the water coming down the bypassed reach especially in the summer. The explanation is two fold – a larger effect and a smaller effect. The larger is that the water is very cold in the summer coming down from Buckhorn Lake and this water is passed rapidly down the headrace through turbines while it is kept cold by short transit time at high elevation. In contrast the far longer transit time coming down the bypass is at lower elevation and higher valley temperatures netting a far higher temperature in the summer. This is true whatever the mix of flows. The much smaller effect in the summer comes from the project removing heat from the project in terms of electrical energy. These temperature effects were documented in the Kilarc Project[3] (KP) summary, the Draft Environmental Impact Statement (DEIS)[4], filed public comments, and public testimony[5].

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[2] See CDSSRP pages, 165 for the importance or C-141 for Recovery action: "Enhance watershed resiliency in Cow Creek by identifying and implementing projects that would reduce the potential for, and magnitude of, a catastrophic wildfire, and restore forested areas within the watershed including riparian areas."

[3] See http://kilarc.info/Docs_Maps_Drawings/Documents/KC0637%201-14-11%20DH_Proposal_Summary_of_Dec_2010_20110114_DH_5162(24719271).pdf

[4] These and nearly all other documents and references are available at http://kilarc.info/Docs_Maps_Drawings/Docs_Maps_Drawings.htm. Due to the number of filings and references, we will not include most of the common references and older ones here as they are discussed in the Kilarc Project Summary and many others are available on the Kilarc.info website.

> "There would be no effect on critical habitat for steelhead on Old Cow Creek or spring-run Chinook on Cow Creek, because their critical habitat is located many miles downstream of the {Kilarc}Action Area." PG&E, BE[6]. 2007 p. 5-10.

While it is true that the critical habitat is many miles downstream of the Kilarc action area, it is not clear that the effects of the temperature increase will not extend downstream to them. Downstream of the Whitmore Falls is a very large critical habitat for both *O. mykiss* and endangered salmon. The health, extent, and viability of these critical habitat areas are defined by temperature[7] (BO p. 36, KP). These critical habitat areas are far larger than any total in the Kilarc bypass due to its incised nature and will be negatively affected if this cold water is removed. Further, as pointed out in NMFS Public Draft Central Valley Salmon and Steelhead Recovery Plan, temperature affects all life stages and is considered **the key threat** to Cow Creek steelhead[8].

Raising the temperature in these enormous habitat areas would cause a critical physical, irretrievable, and irrevocable destruction of resources, both in the present and in the future. This constitutes an annual "take" not only of habitat but of increased fish stress. Since this "take" was not included, this Biological Opinion (BO) is inadequate and should be rejected.

Increased fishing pressure on existing endangered populations

There are FERC annual recreation reports by PG&E citing extensive fishing at the Kilarc reservoir[9]. People testified in several hearings to that effect. PG&E has collected data in their recreation reports as to how many families from both local and distant towns fish at this reservoir. Assuming the put-and-take Kilarc reservoir facility is demolished, some of these fishing families who come from as far as Chico will fish in the lower Cow and other critical habitat areas along the Sacramento where there are known populations not only of *O. mykiss* but also of endangered salmon[10]. In these areas, incidental, illegal, and intentional hooking and keeping do occur and will increase. This constitutes a "take"[11] This analysis had not

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[5] Davis Hydro has sponsored an ongoing long term study of the water temperatures and hydrology of the Old Cow and parts of the Cow and South Cow to evaluate the future of removing the Kilarc project on the habitat areas downstream.

[6] Kilarc-Cow Creek Hydroelectric Project FERC Project No. 606 Biological Evaluation Aug.2009.

[7] See BO (p.35, 36), Thompson, L., L. Ferraro, Yukako, Impact of environmental factors on fish distribution assessed in rangeland streams *California Agriculture* 60(4) October-December, 2008

[8] NMFS Central Valley Salmon and Steelhead Recovery Plan. Note that despite repeated statements as to its importance, the only NMFS response to this threat is "Install water temperature recorders at select locations in Cow Creek; develop recommendations for minimum in stream flow based on temperature needs.(*ibid* P. C-141) Davis Hydro has an extensive water temperature monitoring program in place since summer 2010 focusing on the Old and South Cow Creeks. Also cited in PG&E BE p. 6-2.

[9] See PG&E's annual P-606 annual Recreation Reports on file at FERC.

[10] Also J. Buell - Personal 3/2011 communication. Incidental hooking and guided boat fishing increases do and will impact salmon in the Sacramento River, and other Creeks that may actually have endangered steelhead or salmon.

[11] As a first approximation, this take might be estimated by multiplying the recorded fishing effort at Kilarc by a typical catch rate and the illegal take and morbidity figures per fish caught. Given the PG&E filed recreation

been done even if based on PG&E filed recreation data. So this BO is deficient and should be rejected.

The direct damage to the fish populations from changing location of fishing pressure maybe eclipsed by the damage to the redds and habitat by fishermen walking in these real critical habitat areas. These direct and indirect effects should be studied and included in the calculus of effects on target endangered populations. They clearly constitute an irretrievable and irrevocable impact on endangered fish resources. Since this "take" was not included, this Biological Opinion (BO) is inadequate and should be rejected.

It might be argued that the hypothetical migration of the fishermen to new streams where are there are fish is not proven. Common sense will find it more likely that the fishermen will migrate to where there are fish than the hypothetical unlikely and uncommon migration of steelhead up past the Whitmore Falls complex, and then pass three miles, of acceptable spawning habitat below the Kilarc Project.

Effects on Chinook Salmon

Temperature

Page 28 of the BO cites that many miles downstream of the Action Area is critical habitat for spring Run Chinook Salmon as well as steelhead. This designated critical habitat (September 2, 2005, 70 FR 52488), occurs at the confluence of Old Cow and South Cow Creeks. There the temperature is identified as too high and the flows are generally low. This reference page concludes that from the junction of the Old Cow and the South Cow down the Spring-run Chinook salmon are not likely to be adversely affected by the decommissioning of the Kilarc-Cow project; the potential for adverse effects is therefore discountable and not expected to reach the level where take will occur.

At this point, the BO dismissed opportunity to maintain what habitat exists up these miles of the Old Cow Creek where the water is colder as a summer refuge. The foremost reason for the decline in these anadromous salmonid populations is the degradation and/or destruction of habitat (e.g., substrate, water quality, water quantity, water temperature, water velocity, shelter, food, riparian vegetation, and migration conditions). (BO p.35) The BO ignores the "take" from removing the cold water from the Kilarc Project from this known steelhead and salmon habitat up the Old Cow from its Junction (PG&E BE p.3-12) with the South Cow. The BO also ignores the "take" downstream of the junction of the two Creeks from temperature effects identified by L. Thompson *et al*[12]. This take addresses directly the take of critical habitat for multiple listed species where again defined this habitat is defined in large part by temperature. Direct relationships exist between water temperature, water flow, and juvenile Salmonid survival (BO p.36). This take has not been included in the BO, therefore, the BO is deficient should be rejected.

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report data, and standard catch rates, estimates of this take alone could exceed the highest estimates of new fish resulting at the Kilarc bypass by many times.

[12] See Fn. 7

Predators coming down the Old Cow

The demolition of the Kilarc facility will increase predation and competition of listed species from existing brown trout and resident adapted trout juveniles coming down the Old Cow bypassed reach. This is increase in predators is from two sources triggered by the removal of the Kilarc Diversion.

1. There will be increase in production in the bypass with increased flows (the whole justification for demolition of the Kilarc Facility). The source of the undesirable resident-adapted ***O. mykiss*** will be kept pure by numerous natural barriers to upward migration including the "impassable" falls" miles below the Kilarc diversion, and boulder cascades below (BO p. 23) and just above the Kilarc diversion.

2. Currently, brown trout[13] and resident-adapted trout drifting downstream are from above the Project are diverted and fatally consumed in the Kilarc diversion (BO p.52).

So there will be an increase in injection of undesirable fish from upstream of the diversion, and this increased population will (according to the theory of this BO) be increased significantly in the Old Cow Creek bypass region due to the increased flow. Then, this flux of predatory brown and resident adapted rainbow trout will pour downstream onto the critical habitat providing a source of downstream competition and genetic pollution of any steelhead from resident-adapted fish.

In summary, removal of the Kilarc diversion will increase predation in the long term, and competition from resident adapted rainbow trout will forever "take" from downstream listed species. This constitutes an enduring take that has not been incorporated in the BO; therefore the BO has not included this log term catastrophic take and should be rejected as deficient.

Construction Effects of Alternative Electric Generation

Cross-Sectional Impacts

Regulations that implement section 7(a)(2) of the ESA require biological opinions to evaluate the direct and indirect effects of Federal actions (BO p.56). Replacement power sources will have to be built. The best standard for the type of green power being demolished here is another multi-megawatt green hydro facility. The Kilarc hydroelectric facility exists and is operating. Any replacement project will have to be constructed *de novo* which will have mostly short term local but widespread consequences across our planet through economic multipliers and industry applicable environmental impact coefficients.

The direct damage caused by these construction activities must be addressed under this BO, NEPA, or CEQA analysis protocol. Since this is a very narrow ESA analysis, it may be suggested that the footprint of the replacement power can be built outside of ESA territory.

[13] The area has brown trout and resident rainbow upstream (PG&E's Br p.2-30,4-5). These are a sustaining population for the past 30 years.

However, the environmental damage and damage to ESA species (and the planet) does not stop at the generation plant footprint. Impacts extend up and down rivers, and as global warming has demonstrated, around our globe affecting thousands of endangered fish (including these very species) remotely as well as all endangered species. Most of the O. Mykiss populations are on other continents. NMFS has not ability to control or mitigate for this damage once wrought. While it may hope to mitigate for this take in the US, most of the jeopardy to the species will be in far larger stocks elsewhere. Should the replacement plant not be hydro, according to the CEC (BO p.58), other types will require supplementary fossil fuels, and the consequences of burning these fuels will have incremental effects across our continent.

As we have seen under the modern paradigm of "stimulus," any new construction project has a multiplier effect through the economy, not just under the footprint of the dam. Just as the environmental effects of a dam extend up and down stream, construction impacts cascade through the global economy and cannot avoid impacting ESA species wherever that increase in economic activity occurs. This being the case, the marginal effect of this increase in industrial /economic activity[14], with EPA multipliers, can be used to evaluate the negative transient and irretrievable and irrevocable destruction of all critical resources and species caused by this activity.

NMFS recognizes this in its jeopardy approach and discusses the importance of "consider[ing] the additive effects (BO p.57) of the environmental baseline, the effects of the action and any reasonably foreseeable cumulative effects to determine the potential for the action to affect the survival and recovery of the species"[15]. NMFS understands the legal requirement and importance of the indirect effects and discusses their importance, but has not yet included them in the analysis. We request that this analysis be redone; it should include not just the steelhead and salmon, but the thousands of endangered species that are affected by changes in economic activity[16]. The scope of the National Marine Fisheries Service and the National Oceanic and Atmospheric Administration is broader than Cow Creek, but it is not so broad as to be able to mitigate, regulate, or inhibit these effects world wide.

At a minimum, the balance of any "take" saved as the result of demolishing this green power source should be evaluated against the incremental "take" of the same fish elsewhere as well as all other endangered species. Since this "take" was not included, by NMFS own indications of what is important, this BO is deficient and should be rejected. Like contributions to global warming, these short-term, cross-sectional effects of demolition and consequential construction have minute but catholic changes have long term consequences, which will be discussed next.

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[14] *Concepts and Methods of the U.S. Input-Output Accounts*, Bureau of Economic Analysis, or similar sources for I/O modeling as applied to environmental burden.

[15] BO pp.56–58

[16] Not to include the many other species that are being destroyed as the result of this activity would only suggest that the National Oceanic and Atmospheric Agency is only interested in anadromous fish to the detriment of all other endangered species affected through changes in the oceans and atmosphere.

Long Term Impacts

Global Warming

The Kilarc site is an existing green energy source. If it were removed, our efforts to reduce and delay the increase in planetary temperatures will be set back. This is an irretrievable and irrevocable impact, identified in Section 7 of NMFS Public Draft Central Valley Salmon and Steelhead Recovery Plan, on all endangered resources, indefinitely into the future. The BO correctly identifies the issue (p. 44) but has not, as yet, incorporated the impacts from removing green power on the rate of global temperature rise. It identifies the local effect of global temperature rise from actions such as this (pp. 44-45), but fails to see that this effect constitutes a "take" on the local target fish populations and a decrease in their critical habitat. These "takes" (multiple listed species at all possible sites) are a consequence of the demolition of this green power source. This tiny but catholic incremental effect has not been included in their calculus, yet, it alone may eclipse all other effects combined[17]. Unless NOAA can demonstrate how it is controlling these (NMFS-identified-as-important) long term offshore effects, even in a minimalist sense this BO should be rejected in its entirety.

Acid Rain

Since it is unlikely that any replacement green power will be hydro, the replacement power will have a carbon content causing a continuation of the small effect on the pH of all waters downwind. This "acid rain" effect is separable from the "global warming effect, and in an incremental way impacts pH sensitive fish. This effect, while small and generally immeasurable in any one water body, can be modeled and estimated statistically, as it has been in the North East, and its effects estimated on all fish affected. This downwind effect has yet to be included in the analysis and constitutes a "take" incident not only on the US but beyond NOAA's reach to Canada and all downwind countries.

In summary, long term impacts are very important (BO19, 27, 60,63). They are incident globally and as such are far beyond NMFS's ability to manage. They have no known reasonable and prudent mitigating measures other than reconsideration of other alternatives by FERC. In terms of estimating "take" it is not meaningful to compare the transient "take" during construction of a few resident-adapted and hatchery fish to the integral take of all future listed species impacted by these actions.

Decreased Long Term Cooperation with Ranchers

Many local residents, ranchers, and their families fish. They, their friends, and the whole community use the Kilarc facility and consider it a part of their extended community facilities. Requiring them to now drive to the lower Cow and Sacramento where they will intentionally or incidentally catch endangered species, will not help community relations or the listed fish. Further, demolishing the Kilarc facility increases the prevalence of fire around their houses and possibly impacts their water supply. These consequences are unlikely to generate rancher cooperation. Even if we ignore the fishermen who may inadvertently

[17] BO page 44-45 is an exercise in thinking globally and not acting locally..

trespass on redds on these ranchers creeks, if there is no Kilarc Fishing reservoir, the overall effect on the fish and their habitat will be negative. The public outcry over removing the Kilarc facility has been, in the words of FERC "overwhelming" forecasting a fish resource agency public relations catastrophe. Generating rancher cooperation is a central restoration action identified in the Central Valley Salmon and Steelhead Recovery Plan. Since rancher cooperation is an important action item identified by NMFS to help re-establish the steelhead habitat, negatively impacting relations constitutes an un addressed take, the BO is deficient and should be rejected as inadequate.

Summary Discussion of Physical Impacts

Comments on all of the above physical effects have been filed usually multiple times by various parties and have irretrievable and irrevocable impacts on these fish resources. Since all public testimony and most filings - no matter how cogent, scientific, or authoritative have been ignored by NMFS as evidenced by the BO text and its references, it is clear that this BO is not based on current information, and thus is deficient and should be completely rejected.

Ignored FERC Filed Information

On ESA listing issues, NMFS does not have to conduct additional studies. However, even there, NMFS cannot ignore available physical and biological information and studies, especially if that information is the most current or is scientifically superior to that on which the decision-maker relied.[18] In the issues cited above there is science, reports, studies[19], and data to indicate that removing the Kilarc Facility will have a negative effect on the habitat and also in some cases directly on the fish. These best-available sources are all relevant and cannot be ignored.

In this case heavy reliance on consultation with and documents from PG&E which is a prejudicial source and avoidance of other filed studies, data, and local observations and

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[18] The Endangered Species Act and "Sound Science", E.H. Buck et al. Congressional Record Service Pub. RL32992, 2007.

[19] Typical avoidance of science and reports is the filed and publicly presented analysis done by Robert L. Carey, a qualified biologist based on the 1985 Power and Osborne paper showing it unlikely for steelhead to get over the larger of the Whitmore Falls. See: Attachment A Exhibit 1 to document KC0625 in the documents at Kilarc.info, or http://kilarc.info/Docs_Maps_Drawings/Documents/KC0625%208-25-10%20Tetrick%20-%20A%20Killer%20Analysis%2020100825-5114(24101207).pdf . The Power and Osborne paper was used as the definitive (and only) reference paper by Benthin, Berry, and Manji who concluded in Feb. 2002 that steelhead may be able to ascend the upper Whitmore Falls. (see Attachment A Exhibit 2, *ibid)*.
The analysis was filed with FERC and presented at one of the public hearings didn't even consider the additional difficulties imposed by the nexus of the lower Whitmore falls and the canyon in between.

Rather than referencing the analysis of MR. Carey, offhand statements quoted by PG&E are taken as fact, " No anadromous fish have been observed above Whitmore Falls, but it may be possible for them to pass over the falls during some high flow events (Myers pers. comm. 2008). The frequency with which steelhead or Chinook salmon might pass over Whitmore Falls is unknown, as there have been no studies to assess this." BO Page 52 quoted from PG&E BE p. 4-4.

expertise has led NMFS to err in its Biological Opinion. NMFS has an obligation to propose reasonable and prudent measures, not to change a project but, to improve the environmental outcome of a project. For example, as a prudent measure, it could split the project into two action areas and undertake a careful analysis of all alternatives proposed might be a proposed and negotiated as part of the cost of a project. (For example, simply leave Kilarc facility standing as part of the cost of decommissioning.)

Discussion of the Existing Biological Opinion Conclusion

The BO assessment concludes:

> Project {demolition} is expected to result in overall net benefits to **migration, flow, temperature, entrainment, food availability, and predation**, in the Cow Creek watershed (BO p.57).

We suggest that for the Kilarc half the project that has not yet been clearly shown. The best available information suggests differently. The following section will look at each of these cited benefits separately:

Migration

> "No anadromous fish have been observed above Whitmore Falls, but it may be possible for them to pass over the falls during some high flow events (Myers pers. comm. 2008). The frequency with which steelhead or Chinook salmon might pass over Whitmore Falls is unknown, as there have been no studies to assess this." (BO p. 52)

First, the Kilarc project has neither a significant effect on the water flows over the Whitmore falls nor a significant effect on the 9 miles (DEIS p. 80) of habitat between the falls and the project. Thus, given that no steelhead have ever been seen in this reach whose flows are unaffected by the project, how removing the project provides net benefits to migration is unknown.

The filed analysis[19] by Bob Carey cited finds that it is near impossible for steelhead to mount the Upper Whitmore Falls starting just below it. This feat, were it possible, is made considerably difficult at high flows by the canyon between this Upper Falls and the Lower Whitmore falls which has few resting points in it. In judging passage, it is not only the height of the Upper Whitmore Falls which is determinant, it is integral passage up a long entrance gorge below the Lower Whitmore Falls, then mount the smaller Lower Whitmore Falls, then up the quarter mile gorge which is a confined torrent at high flows inhibiting rest, to then the fish must mount the upper Falls, a feat of a significant magnitude.

Third, even if fish were to make it to and over both Whitmore falls, and the gorge between them, their numbers would be small relative to the continuous rain of juveniles from the

upstream population of resident-adapted fish. How they could make this upward migration in sequential years for any kind of sustaining population is unclear in that by any estimation these flood events are infrequent. Since return above Whitmore Falls is unlikely, the ones that get to the Whitmore Falls base end up in an area of Old Cow Creek below the falls that is a narrow canyon with limited habitat for miles downstream.

In summary, there is no upstream migration or sequential migration to support the premise that demolishing of the Kilarc Project would enhance.

Flow

There will be no change in flow in any area where there are will ever be significant anadromy. It is nine miles from the two Whitmore falls up to the Project tailrace. That net benefit from flow changes is zero.

Temperature

The Kilarc plant does have a temperature effect – that is of cooling the water below it where most of the good habitat is. This has been mentioned in filings testimony at public hearings. Removing the hydro will increase temperatures down the Old Cow including all the fish-accessible areas below Whitmore Falls and on down to the areas in the Old Cow and Cow where there is documented critical Chinook and steelhead habitat. It is unclear how raising the temperature in critical temperature impacted habitat is a benefit. This is a take.

Entrainment

It is documented in the BO that there is possible anadromy upstream of "the impassable falls" about 2 miles below the Kilarc Diversion (BO p. 23). What fish are entrained by the unscreened Kilarc diversion (BO p.53) are predatory brown trout, and competitive and predatory resident-adapted upstream *O. mykiss*. As most water is swept into the Kilarc diversion, all these fish are sent to their death. If the Kilarc diversion were not to exist and these fish were not caught or killed in the turbines, they will pass down the Old Cow bypass to critical habitat areas and will consume, and compete with known, listed species populations.

It is unclear how increasing the prevalence brown trout and genetic competition from resident rainbow trout will help the prevalence of steelhead. This action – removing the Kilarc diversion, and thus increasing competition and predation in critical habitats, below the Kilarc facility, should be considered a permanent and significant permanent "take."

Food Availability

Increasing resident-adapted *O. mykiss* and trout propagating downstream in the bypass will absorb any primary production that might increase food availability to documented downstream salmon and steelhead in the lower Old Cow and Cow.

The increasing prevalence and competition for food from browns and resident-adapted fish will diminish food available to listed species downstream in critical habitat. This is difficult not consider a permanent take.

Predation

Again, the Kilarc diversion currently sweeps predatory brown trout and resident-adapted rainbow trout out of the Old Cow to their death. If the diversion were removed, these fish would tend to increase the number of predators downstream where they will prey on steelhead and salmon. That would be a permanent take.

In summary, the conclusion that the Kilarc project demolition is expected to result in overall net benefit is not supported by logic, observation, or fact. Given that these facts have not been included, this BO errs and should be rejected. Given that the conclusions are the reverse of those stated, a complete reversal of the BO is warranted.

Foregone Opportunities

Other direct effects are many and will not be dwelt on at any length as they are speculative and dependent on NMFS reviewing ideas to help the fish beyond the preferred alternative. It is the clear intention of Davis Hydro is to act with, and through, the Kilarc Foundation to help these fish. As tokens for our future work, only two areas will be mentioned[20].

Decreased Funding for Habitat Restoration

If the Davis Hydro proposal were accepted there would be money and assistance to help the fish – primarily through habitat enhancement, fish passage projects, education, outreach, research, and various re-establishment support projects. If the relationship with Davis Hydro is delayed, helping the *O. mykiss* genepool will be delayed with predictable consequences[21].

Decreased funding for Re-establishment Work and Research

Davis Hydro wants to support research on outbreeding programs to restore genetic and epigenetic health to all the Northern Central Valley Steelhead.

These and other (non-listed species) benefits such as habitat provided to fish and wildlife in the canals and forebays have been made clear in multiple FERC filings. Implementing the demolition alternative precludes discussion and implementation of these ideas. This elimination engenders a take of the best options for the fish, the community, and the planet. This also constitutes a take of the listed species -- In this case, a very large one. Recognizing that NMFS cannot change a project but could work with FERC to reasonable and prudent measures to compensate for unavoidable projects impacts on listed species. It is certainly reasonable and prudent for NMFS to dissect the project into its two components and to discuss the proposed Alternatives with their proponents.

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[20] See the extended list as of last December in The Kilarc Project dated January 2011 (Doc. KC0637 http://kilarc.info/Docs_Maps_Drawings/Documents/docs.htm).

[21] See Chapter 13 of R. Frankham *et al*, Introduction to Conservation Genetics 2010 and Pages 4-110-115 of the Hatchery and Stocking Program EIS/EIR, CDFG 2010 describing the long term depressive legacy consequences of the current hatchery infused population.

Analytical Structure

An alternative to demolishing the complete complex FERC Project 606 is to study and relicense it into its two components as has been suggested by Davis Hydro. The reason is simple. There are two separate complete hydropower facilities on two different watersheds. These sub-projects have very different geomorphology, ecosystems, and fish habitat resource potential. Not separating the Kilarc - Cow Creek project into its two components and examining each action on its own merits has two effects.

First, the Davis Hydro alternatives, among others, could be more carefully considered. This opportunity can yet be taken. The second is combining two complex projects into one analysis leads to sweeping statements that are inaccurate in their generality and thus misleading. See Attachment I for examples.

By considering the individual sites separately within this BO, a constructed conclusion is to request, as a reasonable and prudent measure, to continue the operation of the Kilarc facility under appropriate terms and conditions as a cost of demolishing the rest of the project.

Federal Data and Study Adequacy

Davis Hydro professes no professional understanding of Federal law but a brief review of the filing raises questions of the following Federal actions that provide a framework for Federal Agency analyses. Clarification would be gratefully appreciated; we regret any misunderstand of Federal law and administrative practice.

Federal Data Quality Act

The BO does not seem to comply with the legal requirements of the Federal Data Quality Act (also called the Information Quality Act) (IQA). This act requires maximizing the quality, objectivity, utility, and integrity of disseminated information. To meet this law, as yet in this BO, the following issues need to be addressed {we will focus only one of the following areas for brevity}:

> Quality: There is no quality information provided on key physical issues such as temperature, fire impacts, fishing pressures, fish populations, passage statistics or any other key determinant of a scientific analysis that can make a determination of "take". Even under the bar of "best available information" the BO ignored all FERC filings and local information other than the near singular PG&E BE. These filings, reports, analyses were not discounted, they were not even addressed. For example, in the question of fire, there is ample existing local data on fire prevalence and preventive measures such as the recent work by the Western Shasta Rural Conservation District Paper cited above. It is poor quality report to ignore these available data. Temperature effects of removing the hydro have been repeatedly introduced into the

public record. Any hydrologist will confirm the effect described. It is poor quality to ignore the inherent physics of hydro and the obvious meteorology of water picking up heat from the atmosphere when it moves slowly at low elevations. This heat gain is identical to that leading to the high water temperature is cited by NMFS as a central problem of Cow Creek in the summer, yet summer heat gain is ignored when non-supportive of the preferred alternative.

Objectivity: The objectivity of any opinions by NMFS is compromised by participation in the March 2005 Kilarc Cow Creek Project Agreement[22] that was made prior to all reasonable alternatives being presented and any studies made (BO). When a decision had been reached and agreed to *in camera* and without local data or study of the consequences, the participants are parties to that process and are compromised in making any subsequent objective decisions. Attachment II to this Comment addresses this further.

The analysis is separately deemed non-objective in that it relies to a great extent on the PG&E's BE, a document written many years after the decision was made to demolish the facility. PG&E is a party interested in pleasing NMFS due to its reality that it knows NMFS wants the site demolished. Nothing PG&E writes of files can be considered objective in light of this derived liaison. Yet, the PG&E BE forms the basis of most statements on the Cow Creek area and functioning in the BO.

Utility: The key data on local, global, long-lasting, and cross species effects are useful if not critical for evaluating net effects of an action of that scope. No useful local data on these effects have been provided, yet there have been hundreds of studies of the effects of man and his industry on the environment. None have been incorporated. The utility of the non-included data is zero.

Integrity[23]: While this normally this typically refers to the integrity (unbiased, without prejudice) of the evaluation, that criteria cannot be met due to the prejudicial 2005 Agreement, so we use another sense of the word: "unity or unbroken completeness". Here "integrity" is used to describe the integrity of addressing steelhead enhancement at the Kilarc site. The concept of "integrity" here includes: geographic, genetic, ecotype, and data integrity.

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[22] Available as a PDF as document KC0020 on the Kilarc.info website, or directly at http://kilarc.info/Docs_Maps_Drawings/Documents/KC0020%20Decommissioning%20agreement.pdf

[23] The reference in the guidelines from OMB are different that stated by NMFS's interpretation. Because there is some ambiguity in the legislative reference; we choose an idiosyncratic but relevant usage of the word "integrity" here. The NFMFS IQA guidelines can be found at: https://reefshark.nmfs.noaa.gov/f/pds/publicsite/documents/policies/04-108.pdf

Integrity Discussion

Genetic Integrity

The lack of genetic integrity has been made clear in the work of Lindley *et al* [24] 2006 as cited in the Hatchery Impact Study of 2010[25]. The entire Californian steelhead gene pool has been repeatedly corrupted by imported steelhead[26] and widely mixed across California hatcheries for many years, destroying any native *O. mykiss* strain.

> Artificial propagation of *O. mykiss* began in the 1870s in the San Francisco Bay area (Behnke 1992). These fish were presumably rainbow trout. From 1877 to 1888, egg taking stations were established on the lower McCloud River (upper Sacramento River Basin) for propagation of redband trout and coastal steelhead, with no apparent effort to separate the two forms (Behnke 1992). From that time, *O. mykiss* has been widely propagated, and stocks have been transported literally around the globe. Behnke (1992, p. 174) stated that "the overwhelming majority of brood stocks of rainbow trout maintained around the world originated mainly from various mixtures of coastal steelhead." Therefore, in evaluating artificial propagation of steelhead, it is also important to consider the propagation of rainbow trout. The popularity of *O. mykiss* as a cultured species makes it infeasible to discuss each propagation facility on the west coast in this document. Behnke (1992, p. 174) noted that, "in California alone, 169 hatcheries and egg-taking stations drew on diverse populations of rainbow trout from 1870 to 1960." *(NOAA-NWFSC Tech Memo-27: Status Review of West Coast Steelhead)*

In summary, the mixing of hatchery fish and all known significant below-dam populations has been significant for many years[27] eliminating any genetic integrity.

Geographic Integrity

This NOAA reference further documents that steelhead stray extensively from natal habitats on return[28]. They revert commonly to the ubiquitous resident form, rainbow trout. Finally,

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[24] Lindley, S. T., R. S. Schick, A. Agrawal, M. Gosling, T. E. Perason, E. Mora, J. J. Anderson, B. May, S. Greene, C. Hanson, A. Low, D. McEwan, R. Bruce McFarlane, C. Swanson, and J. G. Williams. 2006. Historical Population Structure of Central Valley Steelhead and its Alteration by Dams. *San Francisco Estuary and Watershed Science* Vol. 4, 1 (February 2006): Article 3 This is available through: http://www.cbr.washington.edu/papers/hist_pop_structure.html

[25] CDFG Hatchery Operations Final DFG Environmental Impact Report (EIR/EIS) http://www.dfg.ca.gov/news/pubnotice/hatchery/ See in particular P. 4-172 and the Araki *et al.* references, and the conclusions "Impact BIO-214" on p. 4-197-201

[26] Primarily Skamania directly and indirectly from a single hatchery in Washington State. (Buell *ibid*, NOAA-NWFSC Tech Memo-27 Status Review of West Coast Steelhead, *et seq.*) The limited genetic diversity of the Skamania hatchery population has been outcrossed into the limited genetic diversity of *O. mykiss* in the hatcheries northern Sacramento River. Ignoring the depressing effects of the inappropriate environmental epigenetic coding, the underlying outcrossing genetic depression could be a major source current steelhead recession. Ignoring hatchery condition effects, it is unlikely the Skamania environment is similar to the more southerly Sacramento River leading to maladapted genes or coadapted gene complexes. While this artificial gene flow may have been intentioned to strengthen local stocks, there little evidence of its success. Given that this gene flow had occurred so repeatedly, it is unclear on what basis an integral ESU could be defined.

[27] See footnote 25, pages 4-197-201, and references.

[28] See NOAA reference in footnote 26 above. Straying in the California Central Valley is found to be as high as 24-35 percent. With gene flow anywhere close to this level, it is unclear how the idea of an ESU could be

the California Fish and Game (CDFG) can find no *refugia* where any ancestral genotypes exist[29].

> There appear to be no steelhead-bearing rivers in the Sacramento River Basin that have not received releases of multiple hatchery stocks ... Major steelhead production facilities ... have utilized steelhead stocks originating from within the basin as well as out-of-basin stocks; stock transfers between the Central Valley steelhead facilities have historically been commonplace (CDFG 1994) (*ibid*).

There is no *O. mykiss* geographic integrity here. Not when fish are carried hither and yon and mixed in for over a hundred years.

Ecotype or "anadromy" Integrity

While many diverse populations have genetic differences, no cross-population anadromy-specific allele sets have been found. It has yet to be shown that steelhead have a unique allelic structure from rainbow trout that is the same across allopatric populations. When they can change eco-responses back and forth with the same genes or gene pool, observed genetic differences may only be phenomenological or derivative, not causal. If the same allelic markers were found differentiating eco-behavior adaptation across genetically distributed populations, there would be a basis for of ESA consideration.[30] Trout that readily adopt anadromy are different. But the cross population "anadromy imprint" signature is likely to be on the malleable, heritable epigenome, not the integral, intact genome.

Data Integrity

Plenary data on steelhead population in California, the 2008 Review of Steelhead Monitoring Programs in the California Central Valley,[31] clearly indicates the paucity and lack of integrity of local species data or even wider area effective monitoring programs for steelhead:

> Although 36 of the 63 programs listed in this review are designed to monitor juvenile anadromous fish, none of these programs are capable of generating abundance, production estimates, or trend data for juvenile steelhead. These data are required to adequately assess progress towards recovery goals mandated by the Central Valley Project Improvement Act, Salmon, Steelhead Trout and Anadromous Fisheries Act, California Endangered Species Act, and the federal Endangered Species Act. Captures of juvenile steelhead are too low (resulting in

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supported. However, while there may be no genetic basis for these legal distinctions, there may be an epigenetic one.

[29] M. Brown, USFWS RB Personal Com. 2011; J. L. Nielsen, S. Pavey, T. Wiacel, G.K. Sage, and I. Williams, Genetic Analyses of Central Valley Trout Populations 1999-2003. Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement. p.4-200.

[30] Causality may yet be shown, but a review of the literature shows only association, not causality. Candidate loci reveal genetic differentiation between temporally divergent migratory runs of Chinook salmon by Kathleen G. O'Malley, Mark D. Camara and Michael A. Banks is a typical paper (albeit it in a different species) that finds clear genetic markers indicating, or even forecasting, behavior in one bimodal population but does not demonstrate a basis for its conclusion that the genetic differences "may influence migration."

low confidence in the estimate) throughout the CV for a meaningful assessment of production or trends[31].

This California-wide data paucity is complemented by only two brief survey of the Old Cow over the past 20 years. Showing, as expected from many years of hatchery planting some presence of brown and resident rainbow trout.

Integrity Summary

It appears that by any account, "integrity" of analysis of California steelhead is singularly lacking. In addressing the issue before us, the BO, it is not possible to castigate or support an analysis of a phenomenon that has no integrity of its own or its analytical structure. A Federal court[32] found that a fundamental purpose of the ESA - to preserve natural, self-sustaining populations - caused it to be scientifically questionable whether risk assessment criteria developed by NMFS for making status determinations could be applied to fish populations that included both hatchery and wild fish, since the criteria were designed to be applied only to wild fish[33]. Whether this is applicable here is to be determined by others with legal training.

With these four concerns in mind under the IQA, and questionable legal applicability, we request that FERC work with NMFS, or another appropriate agency, to correct separate deficiencies in quality, objectivity, utility, and integrity in the BO. If these data do not meet the four criteria, we suggest the BO is deficient and should be rejected.

Administrative Procedure Act (APA)

Under the Administrative Procedure Act (APA), a court may set aside an agency's decision if it is "arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law." "Normally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem offered as an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.[34]" The agency must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.[35]"

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[31] Review of Present Steelhead Monitoring Programs in the California Central Valley, C. D. Eilers, Pacific States Marine Fisheries Commission for the CDFG Admin Report 2010-1, Oct. 2010.
[32] Trout Unlimited v. Lohn, No. CV06-0483-JCC, 2007 WL 1795036 (W.D. Wash. June 13, 2007)
[33] This ruling might be extended to suggest that NMFS likewise has no authority to write a Biological Opinion derived from an unfounded status determination.
[34] Motor Vehicle Manufacturers Association v. State Farm Mutual Automobile Insurance Co., 463 U.S. 29, 43 (1983); Okeeffe's, Inc. v. U.S. Consumer Product Safety Commission, 92 F.3d 940, 942 (9th Cir. 1996).
[35] Motor Vehicle Mfrs., supra, at 43; Dioxin/Organochlorine Center v. Clarke, 57 F. 3d 1517, 1525 (9th Cir. 1995). See footnote 18 for origin of some material on this page and further related issues and sources.

NMFS, as yet, has failed to consider fire, fishermen, temperatures, and indirect effects of various types. NMFS has articulated nothing about data on these subjects, and has demonstrated no rational analyses or data supporting its opinions. We request that the studies requested in scoping documents and numerous filings over the past two years on the various impacts of these alternatives be brought to bear under this act and the results of those studies defended as proscribed by Federal law. While nothing in this law may require NMFS to undertake new studies, the needed studies are the identical studies needed in the EIS and necessary for Alternative selection by FERC. If NMFS chooses to rely on the best scientific data available, it should present it and at the same time realize that the best scientific data now available may not support any genetic basis for continuation of listing steelhead as genetically distinct from common rainbow trout[36].

With this existing science in mind, we request FERC work with NMFS to explain why they have failed to consider important aspects of the problem including water, temperature, displaced human and fish predation, fire, indirect effects and long term effects. We request information on why they have made an arbitrary and capricious decision that runs counter to the evidence already presented in FERC filings, and a satisfactory explanation for its lack of a rational connection between the present facts and analysis[37] in the FERC record, the existing science and the thrust of the BO. If this connection is not presented, we suggest the BO is deficient and should be rejected.

Federal ESA Jurisdiction

The BO shows on Figure 4 that:

> Designated critical habitat for Chinook Salmon September 2, 2005, 70 FR 52488), occurs at the confluence of Old Cow and South Cow creeks, approximately six *{sic}* miles downstream of the Action Area, and its intermittent usage consists mostly of rearing juveniles (BO, and BO Figure 4).

Critical habitat was designated for Central Valley steelhead on September 2, 2005 (70 FR 52488). On NOAA maps as of 3/2011[38], it appears to extend to just above the Whitmore Falls almost nine miles below the Kilarc tailrace. It does not extend to anywhere near the Kilarc Action Area. In 2003 CDFG and NMFS revised their management objectives for the Kilarc Area to include anadromous Salmonids based on a re-evaluation of the Whitmore Falls(PG&E BE cited in BO, pp. 51-52[39]). However, modification of Critical Habitat designation from the September 2005 boundaries may require a significant Federal process

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[36] A Federal court in *Alsea Valley Alliance v. Evans* invalidated the NMFS decision to distinguish between hatchery and wild salmon for purposes of listing determinations under the ESA in instances when there was no evidence of a genetic distinction between the two stocks. See Reference 18.

[37] See Pages

[38] BO Figure 5 and http://imaps.dfg.ca.gov/viewers/calfish/app.asp?LyrIDs=1-16|1-17|1-12|1-11|1-10|1-14|1-15|1-18|1-19|2-2|2-1|2-232|2-233|2-7|2-5|2-6|2-5b|2-3|2-4|3-2|3-5|3-209|3-1a|3-1 This CDFG map is clearer.

[39] PG&E BE cited in BO, pp. 51-52.

that is not documented in this BO. Finally, there is no evidence that the project almost nine miles upstream of the designated critical habitat areas has anything but a positive effect on local predation, water quality, (temperature, and fire runoff pollution and turbidity). Since the critical habitats for both target species are far downstream from the Kilarc action area, it is unclear the extent of authority NMFS has to address this concern under this BO without an *a priori* determination. No such determination has been presented. Combining these two sites under one rubric leads to misleading results and a poor outcome for the fish.

Presidential Directive dated March 9 2009

Finally, the BO does not meet the Administrative Directive of our president on scientific integrity dated March, 2009[40]. This memo requires that each agency should have appropriate rules and procedures to ensure the integrity of the scientific process within the agency. The directive goes on to require that when scientific or technological information is considered in policy decisions, the information should be subject to well-established scientific processes, including peer review where appropriate, and each agency should appropriately and accurately reflect that information in complying with and applying relevant statutory standards.

We request clarification of how the BO complies with this directive by showing how they used well-established scientific processes when they produce the final version of this BO. Further, it is requested that the supporting data and resulting scientific or technological findings or conclusions considered or relied upon in making this BO be made available to the public. Until this is provided, this BO is deficient and should be rejected.

Conclusion

This is a start on producing a Biological Opinion, for a singular narrow response to a FERC request. It is, as yet, may be found to be incomplete under ESA, IQA, APA, or at variance with a recent presidential directive. It does not look at or consider what is best for the fish other than to reiterate its review of previous proposals. It has not explored with all proponents how to construct the best solution for the fish. While not "required" in a BO, addressing how to help the fish is an opportunity yet to be taken.

Increasing wildfire prevalence increases take as identified in the Central Valley Salmon and Steelhead Recovery Plan (SRP). This has not been addressed. The "take" of higher water temperatures identified in the same SRP has not yet been incorporated. Predation from resident fish has yet to be incorporated. The indirect and long term "takes" indentified in the BO have not yet been incorporated. Finally, and, somewhat hypothetically, the "take" of not allowing Davis Hydro's Kilarc Project to start on fish screening and bypass development, easement acquisition, in-stream and riparian habitat reconstruction, education/outreach, and similar recovery actions steadily increases as the genetic diversity in the remaining population declines. These same actions, identified as funded activities in the Kilarc Project, are identified as needed recovery actions in the SRP. The only positive SRP action the demolition alternative engenders is the destruction of the Kilarc community fishing site (the Kilarc Reservoir) which may have a negative outreach effect on community/ NMFS relations for generations to come.

[40] Memorandum for the Heads of Executive Departments and Agencies, Mimeo, The White House March, 2009. Of particular focus is compliance with sections 1.(c), and 1.(d).

Reasonable and Prudent Measures[41]

The Biological Opinion fails to identify significant impacts of the proposed action on steelhead, a listed species under NMFS' jurisdiction. To focus the discussion, we will focus on two of the many impacts cited above: 1) increases in turbidity and fine sediment transport caused by increases in frequency, duration and severity of hot fires in the Old Cow Creek watershed because of the removal of the Kilarc Reservoir and canal system, critical fire suppression water sources, and 2) water temperature increases during the critical summer base flow period when water currently routed through the reservoir and canal system would follow the natural stream channel down the non-anadromous bypass reach and be warmed due to a longer route and transit time and warmer air temperatures. Details related to these and other impact are discussed above.

NMFS has an obligation under ESA to propose reasonable and prudent measures (RPMs) to mitigate unavoidable adverse impacts of any project on a listed species under their jurisdiction. The impacts identified above are two such impacts. There are two obvious RPMs available for implementation to mitigate these impacts. These are:

- Keep the project roads intact (for fire) and to keep the canal and reservoir full for fire prevention and suppression;
- Maintain the canal system and route sufficient water through a kinetic energy dissipation device at or near the existing powerhouse to reduce downstream predation and maintain downstream water temperatures in critical habitat areas at or above their present values during the critical summer base flow period.

Costs associated with both of these RPMs should be accounted as part of the costs of decommissioning.

Obviously, if an alternative proposed by stakeholders but not considered by FERC were to be elevated to the level of the "Preferred Alternative," the continued operation of the Kilarc part of the project, these RPMs would become moot and any costs associated with maintenance of fire-suppression water supplies and the cooling influence of bypass water would be born by the new licensee.

More work needs to be done, and we look forward to working with NMFS to define and implement what is best for the fish. We see this as an opportunity for a fresh look at all alternatives. Time is of the essence. We ask for reconsideration not only of this BO, but whether FERC has identified the correct preferred alternative in its Draft EIS. .

Richard Ely
Davis Hydro
Davis, California
March 22, 2011

[41] If this or any RPM are not regarded as "reasonable" by FERC, we understand that it is NMFS obligation, in consultation with FERC, to come up with alternative RPMs that are. This affords FERC the opportunity to reconsider alternatives as the result of consultation and reflection such as the one described in Davis Hydro's Kilarc Project. If that action were taken, no RPMs addressing these issues would be necessary.

Attachment I - Misleading Statements

Having two very different hydropower sites reviewed under one license leads to misunderstanding and misleading statements. A few examples follow.

> "without implementation of the decommissioning of the Kilarc-Cow Hydroelectric project, the likelihood of survival and recovery of naturally-reproducing steelhead in Cow Creek is very low" (BO p. 56).

Comment: There are not and have never been any reported steelhead or salmon in the Kilarc project reach. This is a fishing community that so prides itself on its fish that it has had a large stuffed one in a glass case in the town general store for many years. If there were any steelhead caught or sited, all would know it.

> "Steelhead and Chinook salmon could be present near the Kilarc Tailrace" (BO p.58)

Comment: It is probable, that resident-adapted juvenile *O. mykiss* may, on occasion, be in the Old Cow Creek reach area of the Kilarc powerhouse[42]. However, except in the most extreme flood, salmon could not be present. Further, for the purposes of this BO, it would be difficult to argue that an uncommon single-year[43] flood-enabled entry of a steelhead or salmon would constitute any significant support the continued prevalence of the desired anadromous epiallele.

> "Without consistent access to suitable habitat, screening of the hydropower diversions, and a return to a more natural hydrograph, it is unlikely that they would be able to maintain these remnant populations". (*ibid*)

Comment: The Kilarc diversion is not screened and is above any conceivable habitat for anadromous fish (BO)[44]. There is a population of resident-adapted rainbow and browns above the diversion[45].

These and other errors of fact demonstrate that there is almost no existing science or studies existing FERC filings, public comments were used on which to base the Biological Opinion[46]

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[42] There are trout upstream. Anecdotal reports are that trout were planted up at Buckhorn Lake along with Browns and other species. Juvenile trout have been seen in the Kilarc reach and resident-adapted trout are reported above the project. See footnote 44.

[43] A steelhead is a rainbow trout that goes to the sea and comes back. The coming-back is statistically uncommon when the combination of multiple falls and incised gorges and infrequent flooding conditions, consecutive year returns is unlikely. The last reported flood in the area was Christmas 2005.

[44] There are observed and reported resident-adapted *O. mykiss* in and above this area up to Buckhorn Lake. The juveniles form these fish pass downstream both into the project and down the bypass. These would compete and interbreed with any upstream coming fish thereby negatively impacting any potential anadromy epiallele.

[45] Fishermen reports, and M. Barry CDFG personal communication.

[46] Biological Opinions for listing determinations may be made under federal law on existing studies and data. However, this low bar is not available for NEPA EIS applicability and its applicability for agency consultation

other than copied sections from PG&E's BE. Further; the complexity of the dual sites within P-606 leads under a limited effort to only a distant understanding of the site[47], its opportunities, and the consequences of demolishing the facility. This lack of understanding inhibits discussions and analysis on what is best for the fish.

rather than species-listing may be problematic. More important, in this case, it may be leading to an unfortunate decision on what is best for assisting these fish.

[47] Throughout the Opinion, the Project is randomly named the Kilarc-Cow Project and the Kilarc-Cow Hydroelectric Project. Neither are correct. This point is important only because there are two potentially separable hydroelectric projects here, The Kilarc Project, and the South Cow Project.

Attachment II Prejudice

A Regrettable Legal Position

Parties to the 2005 agreement foresaw the issue of prejudicial decision making and attempted to address it (BO p.1-2). Never the less, all parties to that agreement have exhibited a partiality that prevents objective consideration of this issue and now cannot easily back out of their positions without abandoning their preconceived judgment made without ascertaining the facts to be derived from studying the alternatives under NEPA.

All parties are tainted and trapped by the prior 2005 agreement[48] and are thus demonstrate clear prejudice. All parties want is best for the environment – but the prior agreement was not consultation or fact gathering, it was a *de facto* decision, now being referred to at length in the BO, and elsewhere. It was (§2 of the Agreement), and is (BO pp.1-2), recognized as inadvertently prejudicial, (despite all disclaimers) to any unbiased participation in the process. It is prejudicial because in signing this agreement, the signatories demonstrated a prior judgment and separately created a *de facto* reluctance of any party changing their mind and abandoning their partners – the very partners that they work with on many similar issues.

Discussion

As typical examples of this confliction: CDFG cannot easily abandon their support for their National partner, and visa versa. The environmental interveners can not easily publicly question the prior judgment of NMFS whose help they need on many issues, PG&E will quietly but solidly accommodate the agencies as this is a small site for them and PG&E will have the same reviewers evaluating many other sites. Thus, this "prior" agreement compromises all parties and interferes with an optimal solution in several ways. It denigrates or any need for studies or consideration of any data they might uncover; it inhibits a path to adequately address new information as mentioned in 50 CDR 402.16; and in this case, it precludes the unbiased evaluation of a late arrival in 2008 of Davis Hydro and their increasingly sophisticated flexible alternative, the Kilarc Project.

Evidentiary Demonstration

The primary references for local effects of this project are discussions with other signers of the March 2005 Kilarc-Cow Creek Agreement and documents written by or for members of that group. Ignored completely are all filings, data, and observation by non-complicit scientists, residents, interveners, and their representatives. While there are a great many references, close examination shows that most are generic California plenary documents, or citations from PG&E's filings. This lack of analysis or considerations of any public testimony or public filings indicates this Opinion is written by a group of insiders with their mind made up not allowing any outside opinion to penetrate their record. This record of prejudice can be found in both the structure and content of the BO. In NOAA's BO cover letter, and opening pages, it indicates reliance on PG&E's BE, PG&E's License Surrender Application, meeting with PG&E, and their consultants, field investigations and other sources

[48] See footnote 22 for reference and access.

of information. No mention is made of any non-signers to the 2005 Agreement, the public record at FERC including extensive filed observations, analyses, and reports.

Attachment III: The CEC's Review

A Difficult Political Position

NMFS references the California Energy Commission for an evaluation of environmental benefits. CEC staff have responded with the following comments:

1. the whole Kilarc project generates 31.1 GWh per year and that this site's resource value is low due to lower summer production,
2. It would be replaced with a gas fired power plant, and
3. they concluded that the environmental benefits of removing this small facility outweigh its electricity generation benefits.

On these numbered points, we have the following comments:

1 30 GWh or (18 GWh from the Kilarc site) is a significant distributed green energy source. A review of independent hydro projects in California will find this as a large valuable plant. It is true that production drops in the summer, however, the availability, and separately, value of its power then increases in the ancillary services market. This spinning reserve service is needed for regulating wind power variability is valuable as otherwise the utilities have to rely on natural gas for regulation. The CEC may not have understood at the time that unlike small hydro, wind has to be discounted about 17 % in its capacity value, and this has to be made up from other sources such as hydro.

2. Yes, natural gas, along with the delay in retiring coal burning plants currently polluting most of the Southwest. The demolition of this green source perpetuates fossil as a source of acid rains across our country and as an accelerator for global warming.

3. These statements were a staff opinion unsupported by any environmental facts or analysis, and at variance with CEC policies and practice. The CEC supports small distributed generation. The CEC normally retains biological consultants to carefully construct biological opinions. The CEC supports Green generation. The foundation, if any, of this opinion is unclear.

Finally, and most important, we understand the difficult position the CEC is in, and the balance of political capital decisions it must make. The CEC is charged with the promotion of green energy – or more important, the total of all green energy – not any particular type or project. All possible small hydro, in the state may only total to less that 60 MW. All other green energy in the state solar and wind and bio fuels may approach 100 times that. There are about 100,000 fishermen for every small hydropower developer. It is not worth the political capital and CEC resources generally to support a resource that is limited, controversial, and politically costly. We respect their goals.

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CHARLES W. THISSELL
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415/781-4211

Attorneys for Plaintiff
PACIFIC GAS AND ELECTRIC COMPANY

Re: P-606-027

Submitted during Scoping meeting 10/22/2009

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SHASTA

PACIFIC GAS AND ELECTRIC COMPANY, Plaintiff, vs. ALBERT WILLIAM SMITH, individually, and as Executor of the Estate of Mary Schaw Smith; ANN ELIZABETH SOSKE, individually and as Executrix of the Estate of Mary Schaw Smith; JAMES T. WOODBURN, JR.; JAMES WALLACE FLETTER, individually and as Executor of the Estate of Sarah Elizabeth Fletter, Defendants. and all other persons unknown claiming any right, title, estate, lien or interest in the real property described in the complaint adverse to plaintiff's ownership, or any cloud upon plaintiff's title.	NO. 56761 JUDGMENT AND DECREE QUIETING TITLE TO REAL PROPERTY

The above entitled cause came on regularly for hearing before the above entitled Court sitting without a jury on the 25th day of January, 1979, ROBERT R. RICKETT, Esq., appeared as attorney for plaintiffs; JOHN E. FISCHER, Esq. of the Law Firm of DIEPENBROCK, WULFF, PLANT & HANNEGAN, appeared as attorney for defendants, ESTATE OF MARY S. DAY (named in the complaint as

1 Mary Schaw Smith) and ANN ELIZABETH SOSKE; GARY G. GAMEL, Esq.
2 appeared for defendant ALBERT WILLIAM SMITH; MARTIN BRIFMAN, Esq.,
3 of the Law Firm of COOPER, TAYLOR & SANDS, appeared as attorney
4 for defendant, JAMES W. FLETTER, both individually and as Execu-
5 tor of the Estate of Sarah Elizabeth Fletter, and there being no
6 appearance for or on behalf of any of the other defendants;
7 And it appearing and the Court finds that an Order for
8 Publication of Summons as to "all other persons unknown claiming
9 any right, title, estate, lien or interest in the real property
10 described in the Complaint adverse to plaintiffs' ownership or
11 any cloud upon plaintiffs' title thereto", was duly made by the
12 Court and filed herein on the 28th day of May, 1978.
13 And it further appearing and the Court finds that all of
14 the above named defendants and also all other persons unknown
15 claiming any right, title, estate, lien or interest in the real
16 property described in plaintiffs' complaint and hereinafter
17 described adverse to plaintiffs' ownership or any cloud upon
18 plaintiffs' title thereto have been duly and regularly served
19 with Summons and Complaint by personal service in this action or
20 by publication in accordance with the Order of this Court and
21 according to law; that a proper Affidavit of Publication of
22 Summons is on file herein, that the time allowed by law for the
23 appearance of any or all of said defendants, both known or
24 unknown, has expired.
25 That a Declaration Relative to Military Service for those
26 defendants who are known defendants of record other than those

1 representated by counsel at this hearing has been filed herein.
2 And it further appears and the Court finds that the Estate
3 of Sarah Elizabeth Fletter has disclaimed any interest in the
4 property that is the subject of this action.
5 And it further appearing and the Court finds that except
6 for the defendants appearing by counsel as set out above, the
7 default of each and all of the remaining defendants, both known
8 or unknown, is hereby entered.
9 And it further satisfactorily appearing to this Court and
10 the Court finds:
11 1. The complaint in this action was filed on the 7th day
12 of February, 1977; that the Summons in said action was issued on
13 the 7th day of February, 1977, and reissued on the 19th day of
14 April 1978; that thereafter full, true and correct copies of the
15 Summons in said action were on the 2nd day of May, 1978, and
16 within thirty (30) days after the reissuance of said Summons,
17 posted in conspicuous places on the real property described in
18 plaintiffs' Complaint.
19 2. That a Lis Pendens was duly and regularly executed,
20 filed and recorded in the Recorder's Office of the County of
21 Shasta, State of California, on the 11th day of February, 1977,
22 in Volume 1399 of Official Records, at page 402, Shasta County
23 Recorder's Office, Shasta County, California, as provided by law.
24 3. That a Declaration relative to Military service of
25 the defendant, JAMES T. WOODBURN, has been filed and none of the
26 defendants named in this action is in the military, naval or air

force of the United States or an officer of the Public Health detailed by proper authority for duty either with the Army, Navy or Air Force or in training or being educated under the supervision of the United States preliminary for induction into the military service.

NOW, THEREFORE, pursuant to stipulation entered into in open court by all parties appearing herein;

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

1. That the named defendants are the owners in fee simple of those certain undivided interests set forth below in, and entitled to the possession of, all that certain real property situate in the Unincorporated Area of the County of Shasta, State of California, referred to and described in "EXHIBIT A" attached hereto and made a part hereof by reference and as described in plaintiff's complaint on file herein, subject, however, to those certain easements and rights in plaintiff PACIFIC GAS AND ELECTRIC COMPANY described and set forth in "EXHIBITS B, C, D, and E" attached hereto and made a part hereof by reference. The undivided interests of said defendants are:

Albert William Smith	12-1/2%
Ann Elizabeth Soske	12-1/2%
James T. Woodburn, Jr.	8-3/4%
James T. Fletter	41-1/4%
Estate of Mary S. Day (Mary Schaw Smith)	25 %

2. That the claims of plaintiff PACIFIC GAS AND ELECTRIC COMPANY, a corporation, save and except as to those easements

1 and rights more particularly described in "EXHIBITS B, C, D and E"
2 attached hereto and made a part hereof by reference; and also the
3 defendants described in the complaint as "all other persons un-
4 known claiming any right, title, estate, lien or interest in the
5 real property described in the complaint adverse to plaintiff's
6 ownership or any cloud upon plaintiff's title thereto," (unnamed
7 defendants) and all who claim title under them or either of them
8 in and to said real property or any part thereof are without any
9 right whatever; and that said unnamed defendants and each of them
10 or anyone claiming title under or through them or any of them
11 have no right, title, interest, claim or estate whatever in any
12 capacity, in, to or upon said real property or any part thereof;
13 or any cloud of any nature, kind or character upon, in or to
14 the title of the named defendants; in and to the real property
15 hereinafter described.
16 3. That the aforesaid plaintiff and unnamed defendants,
17 excepting as to the interests of plaintiff, PACIFIC GAS AND
18 ELECTRIC COMPANY, described in "EXHIBITS B, C, D and E" attached
19 hereto and made a part hereof by reference, and each of them and
20 all persons claiming under them are hereby forever enjoined and
21 debarred from claiming or asserting any estate, right, title,
22 interest in or to any claim or lien upon the real property
23 described in "EXHIBIT A" attached hereto and made a part hereof,
24 or any part of said property.
25 4. That the property, title to which is hereby quieted,
26 is all that certain real property situate in the Unincorporated

Area of the County of Shasta, State of California, and more particularly described in "EXHIBIT A" attached hereto and made a part hereof by reference as though fully set forth herein.

Done in open Court the 25th day of January, 1979, and signed OCT 6 1980, 1980.

R. W. ABBE

JUDGE OF THE SUPERIOR COURT

APPROVED AS TO CONTENT AND FORM:

GARY E. GAMEL, Attorney for Defendant Albert William Smith

JOHN E. FISCHER, Attorney for Defendant Estate of Mary Schaw Smith (Mary S. Day)

MARTIN B. BRIFMAN, Attorney for Defendant James T. Fletter, Jr.

ROBERT R. RICKETT, Attorney for Plaintiff PACIFIC GAS AND ELECTRIC COMPANY

Diepenbrock, Wulff, Plant & Hannegan
Attorneys for Ann Elizabeth Soske

EXHIBIT "A"

LANDS

Situate in the County of Shasta, State of California.

(APN 099-140-15)

The south half of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M.

EXHIBIT "B"

COW CREEK FOREBAY

A non-exclusive easement and right of way to reconstruct, dredge, maintain and use a reservoir for the storage and release of water within the parcel of land described as follows:

Parcel 1. Beginning at a point in the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., and running thence along said westerly boundary line
(1) north 2° 10.7' east 500.36 feet;
thence leaving said westerly boundary line
(2) East 190.49 feet; thence
(3) South 500.00 feet; thence
(4) West 209.51 feet, more or less,
to the point of beginning; said point of beginning bears north 2° 10.7' east 625.00 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in rock mound accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 2.30 acres, more or less.

Together with the right from time to time to:

A. deposit and level onto said Parcel 1 such debris or other spoil material removed from said reservoir as plaintiff may reasonably deem necessary in the reconstruction, dredging, or other maintenance thereof;

B. raise or lower the water level within said reservoir as plaintiff may reasonably deem necessary for the proper maintenance and use thereof;

C. line the bed and banks of said reservoir with such porous materials as plaintiff may reasonably deem necessary for the proper maintenance and use of said reservoir;

D. use and store temporarily such equipment and materials within said Parcel 1 as plaintiff may reasonably deem necessary in connection with the reconstruction, maintenance and use of said reservoir, canal,

(EXHIBIT "B" Continues)

road or pole lines;

E. use such portions of said Parcel 1 to provide plaintiff with access from the Project Access Road described in EXHIBIT "E" hereof to the South Cow Creek Main Canal described in EXHIBIT "C" hereof, to the Kilarc-Redding 60 kv Pole Line and Communication Pole Line described in EXHIBIT "D" hereof, and to the southeast quarter of the southeast quarter of Section 31, Township 32 North, Range 1 West, M.D.B.& M., provided, that said access shall be by means of such route or routes as shall occasion the least practicable damage to said Parcel 1;

F. trim and to cut down and clear away any trees or brush, and to control vegetation by any and all reasonable means, including spraying, which may interfere with plaintiff's use of said reservoir;

G. prohibit the taking of any water from said reservoir, or the erection or construction of any building or other structure, or the construction of any reservoir or other obstruction within said Parcel 1, except that owner shall have the right to drill a well within said Parcel 1, provided that the location of any such well is approved by plaintiff, which approval shall not be unreasonably withheld, and such well does not cause a taking of water from said reservoir; and

H. mark the location of said Parcel 1 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 1.

(End of EXHIBIT "B")

EXHIBIT "C"

SOUTH COW CREEK

MAIN CANAL

A non-exclusive easement and right of way to reconstruct, maintain and use a canal for the purpose of conveying water within the parcel of land described as follows:

> Parcel 2. A strip of land of the uniform width of 75 feet extending from the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., northeasterly to the northerly boundary line of the south half of the southwest quarter of said Section 32 and lying 50 feet on the northwesterly side and 25 feet on the southeasterly side of the line which begins at a point in said westerly boundary line and runs thence north 55° 07.3' east approximately 390 feet to a point in said northerly boundary line; the point of beginning of this description bears north 2° 10.7' east 1177.32 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in rock mound accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 0.61 acre, more or less.

Together with the right from time to time and at any time to:

A. use such portions of the Lands described in EXHIBIT "A" hereof to provide plaintiff with access from the Project Access Road described in EXHIBIT "E" hereof to said Parcel 2, provided, that said access shall be by foot only and shall follow such route or routes as shall occasion the least practicable damage to said Lands;

B. line said canal with such porous materials as plaintiff may reasonably deem necessary for the proper maintenance and use of said canal and to prevent undue seepage therefrom;

C. excavate for, construct, install, repair, replace, remove and use a buried pipe or culvert in lieu of said canal as plaintiff may reasonably deem necessary for the purpose of conveying water within said Parcel 2;

D. deposit onto said Parcel 2 on the northwesterly side of said canal

V.
1972

(EXHIBIT "C" Continues)

such debris or other spoil material removed from said canal as plaintiff may reasonably deem necessary in the reconstruction or maintenance thereof, or in the construction or maintenance of said pipe or culvert;

E. use and store temporarily such equipment and materials within said Parcel 2 as plaintiff may deem necessary for use in connection with the reconstruction, maintenance and use of said canal, or the construction, maintenance and use of said pipe or culvert;

F. trim and to cut down and clear away any trees or brush and to control vegetation by any and all reasonable means, including spraying, which may interfere with plaintiff's use of said canal, pipe or culvert;

G. prohibit the taking of any water from said canal, pipe or culvert, or the erection or construction of any building or other structure, or the construction of any reservoir or other obstruction within said Parcel 2, except that owner shall have the right to drill a well within said Parcel 2, provided that the location of any such well is approved by plaintiff, which approval shall not be unreasonably withheld, and such well does not cause a taking of water from said canal; and

H. mark the location of said Parcel 2 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 2.

(End of EXHIBIT "C")

EXHIBIT "D"

KILARC - REDDING 60 KV POLE LINE

AND COMMUNICATION POLE LINE

A non-exclusive easement and right of way to reconstruct, replace, remove, maintain and use the existing line of poles with the present number and size of wires as are now suspended therefrom for the transmission and distribution of electric energy, and for communication purposes, and all necessary and proper crossarms, guys, anchors and other appliances and fixtures for use in connection with said poles and wires, within the parcels of land described as follows:

Parcel 3. A strip of land of the uniform width of 50 feet extending from the westerly boundary line of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., northeasterly to the northerly boundary line of the south half of the southwest quarter of said Section 32 and lying 25 feet on each side of the line which begins at a point in said westerly boundary line and runs thence north 44° 35.7' east 261.63 feet to a point herein for convenience called Point "A"; thence continues north 44° 35.7' east approximately 750 feet to a point in said northerly boundary line; the point of beginning of the description bears north 2° 10.7' east 669.14 feet distant from the found 1-3/8 inch iron pipe, stamped S-31-32-6-5, in a rock mound, accepted as marking the southwest corner of said Section 32; being a portion of said Section 32 and containing 1.16 acres, more or less.

Parcel 4. A strip of land of the uniform width of 20 feet extending from the northwesterly boundary line of the strip of land hereinbefore described and designated Parcel 3 northwesterly to the westerly boundary line of the southwest quarter of said Section 32 and lying 10 feet on each side of the line which begins at a point in said northwesterly boundary line and runs thence north 43° 19.7' west approximately 220 feet to a point in said westerly boundary line; the point of beginning of this description bears north 43° 19.7' west 25.00 feet distant from said Point "A"; being a portion of said Section 32 and containing 0.10 acre, more or less.

Together with the right from time to time and at any time to:

A. use such portions of the Lands described in EXHIBIT "A" hereof to provide plaintiff with access from the Project Access Road described

(EXHIBIT "D" Continues)

in EXHIBIT "E" hereof to said Parcel 3 and said Parcel 4, provided, that said access shall occasion the least practicable damage to said Lands;

B. install, replace, maintain and use anchors with appurtenant guy wires, which will extend outside of said Parcel 3, at such locations as plaintiff may reasonably deem necessary for use in connection with the pole line facilities;

C. trim and to cut down and clear away any and all trees and brush now or hereafter on said Parcel 3 and said Parcel 4 and the further right from time to time to trim and to cut down and clear away any trees on either side of said Parcel 3 and said Parcel 4 which in the opinion of plaintiff may be a hazard to said pole line facilities by reason of the danger of falling thereon;

D. prohibit the erection or construction of any building or other structure, or the drilling or operation of any well, or the construction of any reservoir or other obstruction within said Parcel 3 and said Parcel 4;

E. install, maintain and use gates in all fences which now cross or shall hereafter cross said Parcel 3 and said Parcel 4; and

F. mark the locations of said Parcel 3 and said Parcel 4 by suitable markers set in the ground; provided that said markers shall not interfere with any reasonable use which shall be made of said Parcel 3 and said Parcel 4.

(End of EXHIBIT "D")

EXHIBIT "E"

PROJECT ACCESS ROAD

The right to reconstruct, maintain and use a road within the parcel of land described as follows:

> Parcel 5. A strip of land of the uniform width of 20 feet extending from the easterly boundary line of the parcel of land hereinbefore described and designated Parcel 1 under EXHIBIT "B" in a general northeasterly direction to the northerly boundary line of the south half of the southwest quarter of Section 32, Township 32 North, Range 1 West, M.D.B.& M., and lying 10 feet on each side of the line which begins at a point in said easterly boundary line and runs thence
> (1) north 44° 40.2' east 188.39 feet; thence
> (2) north 88° 19.9' east 66.63 feet; thence
> (3) north 36° 45.6' east approximately 197 feet
> to a point in said northerly boundary line; the point of beginning of this description bears South 27.64 feet distant from the northeast corner of said parcel of land designated Parcel 1; being a portion of said Section 32 and containing 0.21 acre, more or less.

Together with the right from time to time and at any time to grade said Parcel 5 for the full width thereof and to extend the cuts and fills for such grading into and on the Lands described in EXHIBIT "A" hereof to such extent as may be reasonably necessary.

Said road is for ingress to and egress from the Cow Creek Forebay described in EXHIBIT "B" hereof, the South Cow Creek Main Canal described in EXHIBIT "C" hereof, the Kilarc - Redding 60 kv Pole Line and the Communication Pole Line described in EXHIBIT "D" hereof, and the southeast quarter of the southeast quarter of Section 31, Township 32 North, Range 1 West, M.D.B.& M.

January 20th, 2012

Kimberley D. Bose, Secretary
Federal Energy Regulatory Commission
888 1st Street, N.E. Docket Room #1-A East
Washington, D.C. 20426-0001

RE: Kilarc Cow Creek Project, FERC Project #606

Dear Kimberley D. Bose,

I am writing to you regarding PG&E and the South Cow Creek Ditch Association's (SCCDA) water rights on the German Ditch. The ditch is part of the water being effected by the Kilarc project and is the entire water supply to my property. As an Environmental Justice community, attention to this matter is of utmost importance.

PG&E owns approx. 34% of the water flowing down the German Ditch. It would be a very significant change to our water rights if that amount of water did not continue to flow down the ditch. In the summer, when the flow is at its lowest, the demand for the water for residents, orchards and hay fields is at its highest. The orchards and hay fields require this water in order to exist.

PG&E's March, 2009 Surrender application (Attachment #1) states: PG&E proposes to abandon its Project-related-water rights rather than transfer them as originally envisioned by the Project Agreement, because abandonment would accomplish the project agreement's goals more easily and with greater certainty. Specifically, abandonment would return the water to the streams without legal proceedings...

PG&E's attorney argues that we won't be effected because PG&E has different water rights on our ditch than the other rights being discussed in their surrender application. That assurance does not give me comfort when I discovered our ditch and two other disputed water diversions have disappeared off PG&E's latest Schematic of Creeks, Canals and Diversions (Attachment # 2). Also, our Association's name has been deleted as the recipient of their water shares in their most recent Surrender applications.

Since the Federal Energy Regulatory Agency is still involved, and Whitmore (located in Shasta County) has been federally recognized as an Environmental Justice community, FERC had the duty and authority to intervene on our behalf (attachment #3).

Chronology

Summer 2002

PG&E holds a meeting with the SCCDA regarding our water rights on the German Ditch. PG&E's attorney tells us they will sell their shares on the German Ditch to our association for $1.00. I stay after the meeting and reconfirm the sale of their shares to our Association. The attorney tells me he will give it to us in writing in a couple of weeks, and he says he already has Camie Weir's (our Associations secretary) address. In 2011, I asked Camie for a copy of the agreement. She explained she never received one.

Sept. 10th, 2007

PG&E Kilarc-Cow Creek Hydroelectric Project Preliminary Proposed decommissioning Plan (Page 5-64) (Attachment #4)

PG&E holds shares in the South Cow Creek Ditch Association for water associated with the German Ditch...
Upon decommissioning, PG&E will divest its ownership of shares in the Association and the shares will remain with the Association.

October 10, 2007 California Department of Fish and Game filed a comment with FERC characterizing PG&E's plan to abandon its water rights as " *a significant modification to the project agreement.*"(Page 2, paragraph 3) This should have triggered enhanced scrutiny from the two Federal Agencies involved in the project.

December 10, 2007

PG&E attorney Mathew A Fogelson' s letter to the California Dept of Fish and Game (Attachment #5)

Consequently, we believe court approval would be necessary for PG&E to change its use from power generation to instream use prior to transferring its water rights.[2] Court approval of such a water rights transfer would be extremely time-consuming and resource-intensive, could be contested by the parties to the adjudication, and could potentially disrupt well-settled water rights on an adjudicated watercourse.[3] As a result, PG&E believes abandonment of its water rights provides a much more efficient and certain alternative to achieving the Project Agreement's environmental goal of leaving the water in the streams and enhancing aquatic values. In this way, the Project-Agreement's goals can be achieved without legal proceedings and with minimum impacts to the other parties adjudication.

Upon abandonment, which simply involves PG&E taking affirmative steps to discontinue its diversions with the intent not to resume diversions, PG&E's pre-1914 rights will cease to exist and will not impact any other water rights or the priorities of those rights.

Abandonment of PG&E's water rights will achieve the Project Agreement's environmental objectives because it is highly unlikely that the abandoned water could be diverted by other claimants.

For all these reasons, PG&E believes that the simple act of abandoning its water rights, effectuated by the removal of its diversion structures without an intent to resume the diversions, will achieve the goals of the Project Agreement more efficiently and with greater certainty than would seeking to transfer those rights to a third party, a process that would require court approval and necessarily implicate a panoply of procedural and substantive issues the resolution of which would be time-consuming and resource-intensive.

3 In our meetings with the community, it has become apparent that there is a high level of concern...that a transfer of PG&E's 1908 priority water rights to a government agency or environmental group would allow the recipient of those rights[California Dept. of Fish and Game] to challenge in some manner current diversions and use of cow creek water. PG&E expresses no opinion on the validity of such concerns. (emphasis added)

this letter was sent to 19 people. Not one of them a member of our Association.

January 9th, 2008

Letter from PG&E to South Cow Creek ditch Assoc. (Attachment #6)

It is PG&E's current intention, upon receiving a final, non-appealable order from the Federal Energy Regulatory Commission approving the decommissioning and removing the Project from its jurisdiction, to sell its 14.9 shares back to the Association for the sum of one dollar ($1.00).

Why the six *year* delay in getting the document to us? Now it states "upon receiving a final, non-appealable order." We agreed it would be effective immediately with the stipulation that it would be in effect "Upon completion of decommissioning." The wording, 'Current intention' reads like legal swiss cheese to me. But, the critical defect in this letter is that it is not from PG&E's attorney as promised, but co-coordinators of the project.

Sept. 4, 2008 (PG&E Draft License Surrender Application Vol.1, PG ES-12)
Any impacts of decommission of existing water rights are appropriately addressed under state law and not through the federal license surrender process.

If this is true, why did PG&E hold a meeting with the SCCDA under federal guidelines?

Sept. 4th, 2008 PG&E Draft License Surrender Application (Vol 1, page E.2-16) (Attachment #7)
IN addition to the water rights discussed above, PG&E holds shares in the South Cow Creek Ditch Association for water associated with the German Ditch...Upon decommissioning, PG&E intends to divest its shares in the South Cow Creek Ditch Association.

Notice it no longer states "back to the Association for the sum of one dollar($1.00)."

March, 2009

Kilarc-Cow Creek Hydroelectric Project License Surrender Application (page E.2-15 &16)
(Attachment #1 & #7)

PG&E remains committed to ensuring that its water rights are used to enhance aquatic resources...

PG&E proposes to dispose of the six water rights described above by abandoning them upon receiving a final Order from FERC approving the decommissioning and removal the Project from FERC's jurisdiction. [closing that avenue of help for people such as myself]PG&E proposes to abandon its Project-related-water rights rather than transfer them as originally envisioned by the Project Agreement, because abandonment would accomplish the project agreement's goals more easily and with greater certainty. Specifically, abandonment would return the water to the streams without legal proceedings and with minimum impacts to the other parties with adjudicated water rights in the watershed.[?] Upon abandonment, which simply involves PG&E taking affirmative steps to discontinue its diversions with the intent not to resume diversions ,PG&E's pre-1914 rights will cease to exist and will not impact any other water rights or the priority of those rights.(emphasis added.)

Upon decommissioning, PG&E plans to divest its shares in the South Cow Creek Ditch Association.

This is clearly not what PG&E is telling us. Again, notice how any reference to the SCCDA as the recipient of those shares has been omitted.

March 26, 2011

I wrote to Gary Stacey, California Fish and Game asking if their agency would recognize the SCCDA's right to PG&E's shares on the German Ditch based on PG&E' s letter of intention (Attachment #6). I have not received a response.

April 8, 2011

Letter from Matthew A. Fogelson, Attorney for PG&E to me regarding my concern that the SCCDA has never received the promised letter of legal conveyance from PG&E of their shares in our water association upon decommissioning of the Kilarc hydroelectric plant. (Attachment #8)

To be clear, PG&E, at the appropriate time as discussed above, will sell the 14.9 shares back to the Association via a "legal document." To the extent you are requesting that such a legal document (for example, a formal, bi-lateral contract)be drafted and executed now, in advance of FERC issuing any orders regarding Project decommissioning, I must respectfully decline. To do so would require an expenditure of resources that is not prudent at this time given all that must still transpire before PG&E would be in a position to sell its shares back to the Association.

PG&E created the need for and promised this contract in 2002. So to deny us this critical agreement as promised because it is an 'expenditure of resources that is not prudent' is unacceptable.

It is my opinion that PG&E was being intentionally deceptive in its dealings with the SCCDA. By not informing us they had made a ' *significant modification to the project agreement"* in regards to our water rights, it appears they were hoping to run out the clock on any meaningful recourse we might have.

The crux of the Executive Order #12898 (Environmental Justice) is for each Federal Agency to ensure "Early and sustained communication with the affected community," including "identifying potential effects and mitigation measures in consultation with affected communities."

We have been denied meaningful involvement in the permitting process from the beginning. We relied on PG&E's promise to us at the 2002 meeting that they would legally convey their shares on our ditch to our Association 'in the next few weeks.' With that understanding, there appeared to be no reason for our participation.

Since the Federal Energy Regulatory Agency is still involved, and Whitmore has been federally recognized as an Environmental Justice community, FERC has the duty and the authority to intervene on our behalf.

Thank you in advance for your help in this matter.

Gratefully,

Heidi Strand
P.O. Box 172,
Whitmore, CA 96096
hswriter@frontiernet.net

CC: Gary Stacey, California Fish&Game
Matthew A. Fogelson, In-house Counsel, PG&E
Record Searchlight
Sacramento Bee
San Francisco Chronicle
Environmental Justice coordinator, EPA
California Public Utilities Commission
Len Lindstrand, W.M. Beaty & Associates
Erin Brockovich
6 members of the SCCDA (hand delivered)

Kilarc-Cow Creek Hydroelectric
Power License Surrender Project
Water Quality Certification EIR

APPENDIX D

PUBLIC SCOPING MEETING TRANSCRIPT

SCOPING MEETING KILARC – COW CREEK

HYDROELECTRIC PROJECT LICENSE SURRENDER

--o0o--

Wednesday, April 10, 2013

Millville Grange Hall
Palo Cedro, California
6:00 o'clock p.m.

--o0o--

Meeting Presented by:
Erin Ragazzi, State Water Resource Control Board
Jeff Parks, State Water Resource Control Board

Also Present:
Lauri Warner Herson, Cardno Entrix
Ammon Rice, Cardno Entrix
Shruti Ramaker, Cardno Entrix
Steven Towers, Quercus Consultants
Elisabeth Towers, Quercus Consultants

CHERYL K. SMITH, C.S.R. License No. 5257

INDEX

SCOPING MEETING KILARC - COW CREEK

HYDROELECTRIC PROJECT LICENSE SURRENDER

Wednesday, April 10, 2013

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MS. RAGAZZI: So I would like to welcome everyone this evening. We're here tonight for a Scoping Meeting for the Kilarc-Cow Hydroeletric Project. And we're going to go through some logistics, and then go over some of the handouts, and then we'll hear comment.

So I'm Erin Ragazzi, and I work with the State Water Resources Control Board down in Sacramento. And a couple of logistics. You all found seats, or you're finding seats quickly. If you need to go to the restroom during this event, feel free to get up and leave, you don't need to sit there and wait for a break or anything. You go out this door over here to your left, you turn left, and then immediately right, and both restrooms are right there.

I'm holding my phone because we all have electric gadgets in our life these days. If you can silence them or turn them off that would be greatly appreciated so we don't have any distractions, that would be great.

And over here to my right we have Cheryl. Cheryl is our recorder this evening. She's here to transcribe what folks say so that we have an accurate representation of the comments that you folks have tonight. So when you come up

to give a comment, please make sure you speak into the microphone right over there at the podium. There is also a mic so that people in the back of the room can hear as well, it's a wireless mic, so you don't have to turn it on or off.

Cheryl has asked that you please, please speak slowly so that she can capture the information that you're saying. And also if you could say your name at the very beginning and spell it, that would be greatly appreciated. I know you guys are filling out some comment cards, but sometimes you can't read people's writings on a comment card, so it would be great still if you could say your name and then spell it out for her.

So there are a few handouts that everybody should have grabbed when they came in. There is three of them actually. First one is an Agenda, what we're going to do tonight, we're going to go through these logistics, and I'm going to handle that. And then I'm going to pass it over to Jeff Parks, and Jeff is going to give a presentation this evening about the Scoping process. And then we're going to open it up to comments for folks. And then we'll be talking about the closing and next steps, next steps being that the draft EIR will be out for public comment, and that will be the next opportunity that folks have to weigh in on this Project.

But tonight we're here to get your actual

comments. So you have the agenda and meeting ground rules. You have an overview of the Project. And then you have this speaker comment card. This is probably the most important one for you to look at right now. So if you know you want to comment already, please fill it out and place it in the basket right over there. If you're not sure if you want to comment, as Jeff is talking and you decide you want to you comment, or at any point in time you decide you want to comment, please fill out this card. And if it is after the presentation, you can slip it to me right over there and we'll give you a cue to provide comments.

So did everyone sign in? Who -- who signed in this evening? Great. Okay.

So we just talked about filling out the speaker card. Depending on the number of folks that want to comment, we may need to limit your comment time. So it is important if you want to comment to put your card over there. If we do limit -- if we do have to limit people's comment time, at the end people talk more quickly or don't have as much to say and, you know, if time allotted at the very end we're more than happy to have folks come back up and provide any comments or thoughts if they have any at the end.

See he's getting ahead of me, he's pressing a button over there.

Okay. So the purpose of the meeting tonight is really to get your comments. So we're going to provide some information just as background, what the purpose of tonight's meeting is to solicit your comments, not for us to get into a huge dialogue back and forth and answer anything more than procedural type of questions. So really we're soliciting your input so that we can prepare our draft Environmental Impact Report.

And to that end, we really want to respect everybody's voice and respect all the speakers, and all points of view are valid. So we really want to hear from you tonight.

And with that, I think I get to turn it over to Jeff.

MR. PARKS: Good evening. I'm Jeff Parks. I think I've seen most of you before. I have been on this Project since the end of 2007, so I was at the Scoping Meeting here for what FERC did. I was at the -- from the roll out of the license surrender application that came out from PG&E, so it's good to still see all of you here.

So tonight, as Erin said, mainly what we're trying to convey tonight is what we're going to be doing in the CEQA process. You know, one of the biggest things about CEQA is transparency and -- and openness. It was designed really to make sure that the public was aware of decisions

that people were making and the impact that those decisions have on the environment. So hopefully I will be conveying that in the right way tonight.

So our mission is to preserve, enhance and restore the quality of California's water resources and ensure their proper allocations and beneficial use for the benefit of present and future generations. I promise I won't be reading all those lines. But just in general, that's -- that's kind of our -- our Mission Statement of the State Water Board.

Just so you know, I'll also be posting this presentation on our Web site afterwards, so you know there are links on here, and I'll make sure to send out a notice. If anybody -- one reason we're asking for everybody's e-mail address back there is we're planning on sending a reminder notice after this meeting that will contain a link to our web site and also a reminder of when written comments are due.

So if you don't know what the State Water Resources Control Board does, we have authority for both water rights and water quality. The people that are here tonight, we're out of the Division of Water Rights. We happen to be doing a Water Quality Program, but the main, you know, if you were looking at us structurally we're -- we're coming out of the Division of Water Rights assistance.

1 One of the main things we do when we're making any
2 kind of decisions at the Water Board is protecting and
3 enforcing the different water uses, or sometimes referred to
4 as beneficial uses of water. The -- there is also regional
5 boards. So there's -- there's our State Water Board, and
6 the regional boards. And out of those come descriptions of
7 each watershed and the beneficial uses of the water
8 associated with all those.
9 So a lot of times, especially in a process like
10 this, we end up being the entity that -- that has to balance
11 the different uses of water as opposed to other state and
12 federal environmental agencies that may have a specific fish
13 or water goal in mind.
14 So why are we here tonight? As most of you are
15 aware, PG&E submitted an application to surrender its
16 hydropower project. That was submitted in 2007, and 2008,
17 9. And our role in this is that before FERC, the Federal
18 Energy Regulatory Commission, before they can issue any kind
19 of order having to do with these hydropower projects, they
20 first must obtain a 401 Water Quality Certification from the
21 State Water Board. The 401 refers to the section of the
22 Clean Water Act we're using our authority under.
23 So what comes out of that Water Quality
24 Certification? Hopefully we are providing conditions that
25 protect water quality and balance those beneficial uses that

we're discussing, and also considers the existing water rights in the system.

So the California Environmental Quality Act, CEQA, that's what this Scoping Meeting is really for. This is something -- this is a state law that Reagan actually signed into law when he was Governor. It's what a State Water Board must do before we make any kind of discretionary decision.

And in this case, the discretionary decision is that Water Quality Certification that PG&E applied for from the State Water Board for this Project. In this case PG&E, because it's not a public agency, cannot be the lead agency, which is basically the party that develops the CEQA document. So in this case the State Water Board is the lead. So the State Water Board is the one that's developing this document, and the other parts of that as well. That means that a State Water Board decides what level of review this Project will get.

In our Notice of Preparation we decided that we're going to go to -- straight to an Environmental Impact Report. There is a lot of different levels of review that CEQA can apply to a project. We decided because of the interest in this Project that it was -- it was prudent to go straight to an Environmental Impact Report. And ultimately this -- this report and the decisions that we make based on

1 this report will reflect the State Water Board's independent
2 judgment.
3 So one of the things that we'll use this
4 Environmental Impact Report for is creating what's called
5 either the CEQA findings or findings of fact. We will be
6 using the -- the assessment that we made in the
7 Environmental Impact Report to create our findings of what
8 we think the impacts on this Project will be, what
9 mitigation measures may be necessary or may already be part
10 of the Project. And ultimately that is what we'll use as
11 our rationale for the Water Quality Certification action
12 that we will take.
13 And -- and so, you know, as I just said, if we
14 issue a certification, the conditions that we would put in
15 that certification would be justified by the CEQA findings
16 which are based on the Environmental Impact Report.
17 The other part of this, and the important part of
18 why we're here, is that FERC must make the conditions in our
19 Water Quality Certification a mandatory part of any order
20 that they issue for this Project. So it's a big
21 responsibility for us in this project and why we're taking
22 this very seriously, because this will become a -- a
23 permanent part of whatever action is taken on this Project.
24 So that's not to say that we can preempt federal
25 law. We can't change any federal laws, it's additive. But

in many cases California environmental law is more stringent than some federal laws, so a lot of times in these projects we're the ones that are putting the most, you know, the -- the condition that, I don't want to say trumps, that overrides other people's conditions.

So the -- the Kilarc-Cow Hydroelectric Project itself, I'm not going to go into much details, I think people have seen what the Project actually is. So it's -- it's owned by PG&E. It's a hydroelectric project. It consists of two different developments, that's the Kilarc side on Old Cow Creek, which consists mainly of the diversion off of Old Cow Creek, and the canal structure that leads to the Kilarc forebay and to the -- the actual powerhouse. And the Cow Creek development on South Cow Creek, which is similar in diverting water from Mill Creek and South Cow Creek into a canal structure, and ultimately into the South Cow powerhouse.

So PG&E submitted a license surrender application to FERC. The proposal at this point in the Project that is before us is what PG&E has put in their license surrender application. So at this point that Project is to -- is to remove all generating -- remove all generating -- I want to say appliances, that's not the right word.

MEMBER OF THE AUDIENCE: Infrastructure.

MR. PARKS: Yeah, infrastructure from the

1 powerhouses, infill the canals, infill the forebays, and to
2 the extent necessary recreate the streams and remove
3 diversion structures. The intent as I take PG&E's
4 decommissioning plan is to, you know, return the Project
5 to -- or return the Project to pre-Project conditions to the
6 extent possible.
7 So the development of documents within the CEQA
8 process, when we started this, the State Water Board signed
9 an agreement with PG&E and Cardno Entrix. We selected
10 Cardno Entrix as our -- as our consultant for this Project.
11 It's something that you may not be aware, Cardno Entrix did
12 work on some of the re-licensing studies for this Project.
13 One of the things that we did was we have a completely
14 separate staff from Cardno Entrix working on its
15 environmental documents. Just wanted to make sure everyone
16 was aware of that since it is the same company, we did make
17 sure that there is a complete separation of staff.
18 Cardno Entrix is the one that did the developing
19 of the documents and writing them, but they're doing it
20 under the sole direction of the State Water Board. The --
21 the reason PG&E is -- is in this agreement is because PG&E
22 is the one that is compensating Cardno Entrix for the work.
23 But I just want to make sure that's understood the way that
24 works, PG&E is actually paying for the work to be done, but
25 Cardno Entrix is doing all the work under the sole direction

of the State Water Board.

In this case I'm the Project manager for this Project.

And since we're mentioning Cardno Entrix, if I can just introduce some of the Cardno Entrix folks that will be working on the Project. If you can introduce...

MS. WARNER HERSON: Sure. I'm Laurie Warner Herson, I'm the CEQA/NEPA Lead for the water group of Cardno Entrix. So we are definitely separate from the hydro group within the Cardno Entrix company.

With me I have Shruti Ramaker, who is a planner and public outreach specialist; and Ammon Rice, who is also assisting in coordinating and managing the Project and some of the logistics, including this meeting tonight. So this is just the core team, we have many more working on the Project.

MR. PARKS: All right. So... yes, Erik.

MR. POOLE: I'm sorry, but could you go back a slide.

MR. PARKS: Yes.

MR. POOLE: Something you just said is --

MS. RAGAZZI: Is there any way you can come up so Cheryl can capture your thoughts.

THE COURT REPORTER: Your name is?

MR. POOLE: My name is Erik, E-R-I-K, Poole,

P-O-O-L-E.

Sorry. When the -- Jeff, when you had the previous slide up --

MR. PARKS: Uh-huh.

MR. POOLE: -- you said something about what your understanding of PG&E's intent was with the decommissioning Project were to --

MR. PARKS: Uh-huh.

MR. POOLE: -- to return to pre-Project conditions. I just -- do you --

MR. PARKS: I understand your concern.

MR. POOLE: Can you explain that, or -- or can you tell us what -- is that your agency's assumption? Do you have a definition of what those pre-Project conditions were, or...

MR. PARKS: I don't mean to speak for PG&E in this, I mainly --

MR. POOLE: Yeah.

MR. PARKS: My assumption, and this is my personal assumption, not the State Water Board's assumption, is that the Project, when it was agreed to be decommissioned, that part of the understanding from the agencies and the public that was involved at that time was that a key part of that was removing the -- all the features of the Project. So maybe pre-Project was not the right term for that. But it

1 was -- it was the removal and the -- to create a condition
2 where the Project facilities would -- would not be a --
3 MR. POOLE: It would obliterated. They're --
4 they're going to be gone completely; right?
5 MR. PARKS: They will be gone, yes. But it's
6 to -- it's to create a condition where none of the
7 facilities will be an ongoing liability, or an ongoing -- it
8 would involve any kind of ongoing maintenance on the part of
9 PG&E.
10 Again my assumption of the -- of the -- I don't
11 want to speak for PG&E on the Project or why they made their
12 decision.
13 MR. POOLE: I believe that's going to be
14 significantly different from what the conditions were prior
15 to PG&E licensing this Project with FERC, or starting any of
16 this. So I just wanted to try to make sure that that
17 distinction is held in mind as we go through this process,
18 because it's a -- it's a significant one for all of us that
19 will -- that will still be here, depending on the state of
20 the Project facilities after this, but...
21 MR. PARKS: So that's a good distinction, and I'm
22 sorry if I --
23 MR. POOLE: I just wanted to get on it before it
24 got down on the record too far, so...
25 MS. RAGAZZI: And Let's try to hold -- let's try

and hold discussion. If we have clarifications --

MR. ALBRECHT: Is the slide show going to be part of the transcript?

MS. RAGAZZI: Yes.

MR. PARKS: Yes.

MR. ALBRECHT: Okay.

MR. PARKS: So this is -- this is from the -- the CEQA guide book that's written, and this is what we use as advise for how we -- how we go about developing CEQA documents.

As I've said, a big part about CEQA is disclosure. It's full disclosure to people making decisions and to the public about what the significant effects of a project activity can be, identifying ways that it can be mitigated or if, you know, there is ways that significant impacts can be avoided, preventing environmental damage with the same kind of ideas with mitigation measures or simple avoidance. Disclosure, again it -- it sounds repeating, but overall it's disclosure, making sure that the public is aware of what's going on, that the decision-makers are aware of what is going on.

And I'm glad you guys are here tonight because a big part of this is making sure that the public participates, and that we do our due diligence to make sure that the public has a chance to participate.

So as we stated, we've decided to already prepare an Environmental Impact Report. We've identified in the notice of preparation what areas we imagined the Environmental Impact Report to cover. Doesn't mean that it's exclusive to that list, we can always add things based on the comments that are made tonight. And it's really designed to identify what those significant impacts may be, and what mitigation measures there can be made to reduce those.

One thing, you know, we've already identified the alternatives that were presented in FERC's Environmental Impact Statement, we will look at those as well. We'll be evaluating them under the light of CEQA. And one of the things that we will be looking at is looking at how they meet the Project objectives, which at this point the Project of course is what PG&E has asked for, and the feasibility of each alternative. And that final determination will be made when we issue those findings that will be based on the EIR.

The other thing we must do when we -- when going through the process is any comments that are made on the draft EIR, which will be the next step of that, which is we must respond to any comments that are made and basically express how we addressed them in the final EIR.

So this is the real basic order of what's going on. Right now we're collecting oral comments tonight.

There's another approximately two weeks until April 22nd, which is a Monday, when -- that's the deadline for collecting written comments to us. The intent was to, you know, if -- if new things come up after this meeting to make sure there is extra time to be able to send written comments to us.

The next step is hopefully this summer we will be able to issue a draft Environmental Impact Report. That will include a public comment window, usually at least 30 days, if not more. And then as I said, the next step is issuing a final Environmental Impact Report that will address the comments being made in the draft Environmental Impact Report.

MR. ELY: Mr. Parks, I notice in this order of event the word "studies" is not mentioned. Will the State be doing any studies should they be necessary to flush out what the FERC has done.

MR. PARKS: If -- if we find it necessary when we're looking at the information we -- we get from the scoping tonight and from the comments that we receive, we'll evaluate whether we need to do additional studies related to this project. So as I said, the draft EIR will -- will have a -- a public review and comment period.

One thing that we tried really hard to do is the State Water Board will also release a draft of what the

Water Quality Certification would be at that point, with the draft Environmental Impact Report, so that you can see where we're heading with both the Environmental Impact Report and whatever decision we're -- we're ultimately making. Which means that you'll have the opportunity to comment on both of those at the same time, which is also the purpose of doing that so that, you know, disclosure, transparency, we want to make sure everyone sees where we're headed and what we're doing. And with all things the State Water Board does, there's -- there's the allowance for Petitions for Reconsideration when we make final decisions.

And so the next step is making your comments tonight and sending any other comments you have to me. As I said, if you provided your e-mail address I'm going to send all this information around again after this meeting. And please make sure you get comments in by April 22nd to me. And also feel free to give me a call if you have any questions about what's going on with this process, or about your comments, or how to submit them. I will do my best to -- to aid in helping you submit comments.

MR. FLETTER: I'm not sure if I'm going to make a verbal comment or a written comment, but there is no address on this at this point on here.

MR. PARKS: If you just want to wait I will be handing out the -- the -- I'm sorry, Laurie has some copies

of the Notice of Preparation which has my address on there, so if you need the address to send it to.

MS. WARNER HERSON: Also, Jeff, we did bring another version of the comment card that has the address at the bottom in case people need that just on the comment card. So -- oh, of course, can you hear me now.

So we do have other comment cards that have the address, and I can provide those if anybody desires to mail them back. Okay.

MR. PARKS: So please see Laurie after. And as I said before, we're going to post this on our web site. I will also send out a notice to everyone who has provided their e-mail to make sure they know where to find that.

After we gather the comments tonight, which are being, you know, transcripted, I'll be working with Cardno Entrix to develop this draft document, and there will be another public comment period. And this is probably not very helpful to try to write down, so when this comes around this will provide a link to our web page. And we also have a subscription-based service that if you go to this site and sign up, whenever we take actions on projects like these we send it to everyone who signed up for this. So if you want to receive anything on these in the future, we highly advise signing up for these -- or I'm sorry, subscribing to this list.

So does anybody have any questions about the process, the CEQA process?

MR. STANTON: Do I need this? Excuse me. You mentioned that you were going to be the one taking the phone calls and reading the e-mails. Is it solely you, or do you have a staff that is going to assimilate some of this information as well?

MR. PARKS: Well, in one aspect anything you send me is public so, you know, I will be working with my manager and any other staff that I need to work with at the State Water Board to consider any comments that have been made. Does -- does that answer your question?

MR. STANTON: I thought you mentioned that you would take phone calls.

MR. PARKS: Yes.

MR. STANTON: Did I -- okay. Is -- are you the only one that will take phone calls or will other people on your staff take phone calls.

MR. PARKS: I -- the reason I would try to take most of them is because I have the most knowledge about what has happened on this Project, and other people you talk to may not have the immediate background, but you can speak to anyone at the Water Board.

MR. STANTON: You are going to be very busy.

MR. PARKS: I have talked to people on the phone

before, so I have no problem speaking to anybody on the phone.

MR. STANTON: Great. Thanks.

MR. PARKS: So if there's -- if there's no other questions about the process, we are going to move onto public comments.

MS. RAGAZZI: So just want to check really quick, does anyone else want to submit a comment card at this point in time? Okay. Laurie will grab it from you. I'm just trying to get a -- does anybody else -- who else thinks they're probably going to want to talk? I'm just trying to figure out a timing here. We can let people filibuster or we can be hard about it.

Okay. Okay. We'll go ahead and get started so we can make the most efficient use of the time.

MR. PARKS: Bob Rynearson. And, yes, if you could please come over here to the podium, there's a microphone there for the transcriber as well, so...

PUBLIC COMMENT PRESENTED

BY BOB RYNEARSON

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MR. RYNEARSON: This might be real quick. I'm Bob Rynearson, I'm land manager with Beaty & Associates, and we're a member of what is known as the German Ditch

Association which provides water to residences as well as a lot of agricultural uses in the Whitmore area. And I don't even know how much this applies to the EIR, but PG&E several years ago had promised that there -- they had some water rights in that Association, they had promised that they would surrender those rights to the Association, and I just want to make sure that, you know, if they need -- if that needs to be dealt with in the EIR, that that's covered. I'm not even sure if it needs -- needs to be.

But also we've never really seen anything kind of in writing from them where they deeded over any of those, and so -- and I -- I don't know if you -- if anybody from PG&E is here that has an answer.

MR. PARKS: I don't expect PG&E to answer tonight, but that's my understanding of the disposition of those water rights as well.

MR. RYNEARSON: Okay. So I guess my comment then is to make sure that whatever happens in the EIR whether -- so we don't lose those rights because it didn't get covered.

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MR. PARKS: Kelly Sackheim.

THE REPORTER: Would you spell your name.

MS. SACKHEIM: Yes. S-A-C-K-H-E-I-M.

THE REPORTER: And the first name?

MS. SACKHEIM: Kelly, just Y, K-E-L-L-Y.

PUBLIC COMMENT PRESENTED

BY KELLY SACKHEIM

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I have been following this process -- I have been following this process since the kick-off meeting in February of 2007. And first and foremost I want to thank the California State Water Resource Control Board, and Jeff Parks in particular, for taking the actions necessary to truly represent the interests of the citizen-stakeholders in a proceedings where other government agencies and special interest groups have been leveraging their resources to obtain an irreversible outcome before all the facts have been considered.

And I wrote everything down so that I could speak a little bit more efficiently, but I'm going to diverge for a moment. I picked up, as Erik Poole did, on the comment about the Project is being viewed in light of PG&E's objective. And, um, while that certainly would be one of the alternatives, I have some background in doing reclamation with mining companies, and under California law for reclamation there are in fact two options.

One is the objective that was expressed by PG&E, which is to attempt to restore a situation to pre-Project

1 conditions. An equally valid option is to provide for
2 future beneficial use of the resources. And I think in this
3 case, especially where we're talking about an activity that
4 has gone on for over a hundred years and many things have
5 changed around the site, and many stakeholders have come to
6 depend on much of the infrastructure that was established
7 for this particular reason.
8 Looking at alternatives that compare, PG&E's
9 primary objective was also stated, which is that PG&E not
10 remain liable for the ongoing maintenance of its
11 infrastructure. But at the end of the day, PG&E's broadest
12 goal of license surrender is to be able to walk away from
13 the facility. And we really look forward to seeing
14 alternatives that would provide for the future beneficial
15 use of the resources by the stakeholders.
16 And as I said, I represent the
17 citizen-stakeholders. And this evening, the Water Board has
18 provided citizen-stakeholders to present the facts that will
19 yield a different outcome, specifically the preservation of
20 facilities that can be put to beneficial new use after PG&E
21 is granted its license surrender by the FERC, instead of the
22 wasteful destruction of facilities and associated
23 opportunities when there is no evidence that alleged
24 benefits will be obtained as a result of the dismantling.
25 This evening, the Water Board will hear the facts:

1 No. 1, there are many benefits of preserving
2 specific PG&E facilities that are proposed for destruction.
3 No. 2, there are specific plans and entities who
4 are committed to implementing the plans to ensure the
5 benefits of preserving specific PG&E facilities are
6 realized, so the question of feasibility does come into
7 play.
8 Finally No. 3, the rush to dismantle facilities is
9 unnecessary because there are no certain or immediate
10 benefits, and the dismantling option is not foreclosed by
11 allowing re-use to be attempted to occur first.
12 Personally I am committed to supporting the
13 preserving of many of the Kilarc Development facilities.
14 I'm not alone. There are many who seek to collaborate in
15 this effort. In fact, there are multiple competing
16 proposals to beneficially re-use the Kilarc Development
17 facilities. These proposals should be evaluated as
18 alternatives to the proposed destruction of the PG&E
19 facilities that is currently recommended by FERC staff.
20 And I know that Dick Ely and I will be submitting
21 further detail as regards to these alternatives and plans so
22 that they can be evaluated in the Water Board EIR.
23 The alternative that I propose is several elements
24 that will -- I will briefly outline now, and I'm identifying
25 in part the supporters and what the benefits and the

1 beneficiaries would be of this particular alternative.
2 As many people are aware, Dick Ely and I are a
3 small hydroelectric power developers. We also operate sites
4 with a keen interest in protecting and enhancing the natural
5 environment and habitats. And this afternoon we were having
6 a conversation about the habitats that have been created by
7 the infrastructure using the water resource really would not
8 exist without the unnatural infrastructure that's been put
9 in place. It's been 100 hundreds years they've existed.
10 We started before the beginning, and I'm just
11 going to move talking about the Project elements that we're
12 proposing. It really evolved over the last six years based
13 on our growing understanding of what is the so-called
14 "environmental baseline" for this Project and what the
15 Project could become.
16 No. 1, there is no reason that would preclude the
17 FERC from authorizing a third party to resume generation of
18 electricity with the same or similar facilities currently
19 used by PG&E. There has been a lot of talk about that
20 alternative being off table. Three megawatts of water could
21 continue to be generated at Kilarc. FERC staff have
22 repeatedly affirmed that PG&E could simply lock the door and
23 walk away and allow a third party to move forward to restore
24 operations, so long as the environmental consequences are
25 deemed acceptable. Power generation is the first beneficial

use of the water for which the Water Board will be providing Water Quality Certification.

No. 2, Davis Hydro has proposed the implementation of a research facility, utilizing the Kilarc Canal as a laboratory, as well as the buildings to the powerhouse, where valuable learning about anadromous fish could take place, at the same time more fish are propagated. The benefits -- the benefits to anadromous fish would be a beneficial use of the water for which the Water Board will be providing Water Quality Certification.

Finally No. 3, with the collaboration of the Fall River Valley Community Services District, which is having a board meeting tonight so nobody could be present, preliminary permit applications have been submitted to the FERC for the implementation of an open-channel turbines hydroelectric project in the Kilarc Canal that would provide an opportunity for research and development of more efficient and cost-effective turbines that could be replicated worldwide in small channels. The benefits of power generation that may be implemented worldwide using this developing technology would be a beneficial use of the water for which the Water Board will be providing Water Quality Certification.

So these three efforts are complementary. They have committed individuals and organizations that are

prepared to implement them. In addition to the direct benefits that would be derived from new activity, the following benefits of the Project would not be terminated if the facilities were not destroyed as FERC staff currently recommends.

As most of you know, the Save Kilarc committee was established by the late Glenn Dye. I've seen references in the FERC record as early as 2002 that reflect certain benefits. And when there is discussion about the participants at the time when PG&E's objective was developed in collaboration with an agreement with agencies, the participants were limited. It's not that Glenn Dye wasn't there saying let's maintain it, it's that his voice was not incorporated into the discussion.

Over 700 community members signed one petition to save the Kilarc Reservoir. And as reflected in subsequent petitions, comments, attendance at many meetings, and especially tonight, I'm sure that the community does not want to see the PG&E facilities destroyed.

What would be saved if the facilities were allowed to remain in operation?

No. 1, recreational fishing at the Kilarc Reservoir would be preserved.

No. 2, Kilarc Reservoir would continue to be a source of water for fire fighting and groundwater recharge.

No. 3, habitats that have served a variety of species for over 100 hundreds years would not be destroyed on the speculation that steelhead that have never been observed to ascend Whitmore Falls would miraculously take advantage of the marginal new habitat that would supplement the habitat that existed during the same timeframe, while rainbow trout that could have been a source of population were stocked for over 50 years until it was decided to stock only barren fish that could not corrupt any native population that similarly has never been proven to exist.

I thank you for your attention, and look forward to additional comment from my fellow community members.

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MR. PARKS: Betsy Bivin.

PUBLIC COMMENT PRESENTED

BY BETSY BIVIN

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MS. BIVIN: Hi. My name is Betsy Bivin, B-I-V-I-N.

I know that the EIR is going to be a separate document, but in the EIS I noticed some what I consider to be grave errors, and what appeared to be ground truth wasn't done -- by the way I have a Bachelors in Geography from the University of California at Santa Barbara, with a minor in

environmental studies, and did some EIR and EIS work back in my youth.

My concern was that not enough ground truth was done with the EIS study. I'm hoping with the EIR we'll see more ground truth, people actually out in the field. I would -- I also would hope that possibly the hydrologists, biologists, et cetera, would use the community to help them with their study because we have particular knowledge of things that you may not see in a five to seven day period that we could help point out.

In regards to the EIS, I know that again this is going to be a new document, but, um, the areas of concern I have, that I feel there are some inaccuracies are under geologic and soil resources. In that regard, should Kilarc be -- the infrastructure removed, is the area of effect greater than this Project area itself. In other words, will we see erosion downstream, will that be addressed in the EIR with -- and that would be a hydrologist concern.

The other thing, the water resources, some of their data looked a little bit iffy. In some of the cubic feet per second data that they had just didn't seem to make sense, and they were supposed to -- that was during the draft, and then the final said they were going to re-address it. Well, they didn't.

Fisheries. The Whitmore Falls, I'm not going to

reiterate to much, but we all know that fish are not going to get over the Whitmore Falls. They never have. They never will. And that is a big issue with -- in the EIS. I would hope that would be addressed in the EIR.

Botanical resources looked rather iffy again, with biologists out, botanists, maybe do a -- have a -- the community aid and assist in any way we can in pointing out species that might be of interest.

The -- under the wildlife section, oh, sorry, I love the way they address the Mule Deer. Well, it's not Mule Deer, they're Columbia Whitetail.

The other thing is that area in the Kilarc region is a migration area. That I've observed in one day to see 50 deer cross in that region. Nothing was addressed regarding the migration. This is a major migration trail for the Columbia Blacktail Deer.

Also there is a heard of elk. I believe they're Roosevelt Elk, but I could be wrong, I've never seen one, but people have, and they exist up there. And I imagine this is one major, or possible water source, because other people I know have see them in the Miller Mountain region. They weren't -- that was not addressed in the EIS.

Also, raptors, Bald Eagles, I don't know about anybody else, I have see them there feeding off the lake, and Osprey. In the EIS it said this could be mitigated, we

1 didn't see any. Well, they exist.

2 Recreational resources, I don't feel that in the
3 EIS they properly mitigated the handicapped access. Kilarc
4 has some of the best handicapped access for people in
5 wheelchairs to be able to go out and fish in this area.

6 MEMBER OF THE PUBLIC: The best. The best.

7 MS. BIVIN: It is the best. And I have a nephew
8 that's in a wheelchair and that is where we go, that is
9 where we take him, because he can't get to Grace and Nora,
10 and it is the best. And it was not -- I -- I feel they did
11 not take that into consideration well either.

12 And lastly, there are some archeological sites
13 that are not necessarily within the scope of this current
14 Project, but that are possibly upstream and downstream. And
15 I went out with an Elder from Redding Rancheria, and on a
16 scale of one to ten they found an area that they called a
17 nine that is off of South Cow Creek road, a major village.
18 My concern is, if we have greater erosion with the taking
19 down of the infrastructure what archeological sites might be
20 impaired. These were from the Yana Tribe, I believe, that
21 went into hiding and they were thought to be extinct, but
22 they weren't.

23 Anyhow, if you guys would be so kind as to do a
24 better job than the EIS it would be greatly appreciative,
25 because this document was poorly written, poorly studied,

poorly done in my opinion.

And I thank you.

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MR. PARKS: In general, my suggestion is that if you have information that you feel that is -- will be something that we don't have, please try to submit those to us. We appreciate any information you can give us, and please by April 22nd.

Dick Ely, did you want to speak?

PUBLIC COMMENT PRESENT

BY DICK ELY

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MR. ELY: Thank you, Mr. Parks.

This group is incredibly indebted to you because we have no other voice in Washington. As was previously stated, the EIS on the table done by FERC is -- was appalling, deficient, unbelievably poorly studied, and it's an embarrassing situation. I happen to write the first EIS in the United States a few years ago, quite a few years ago, and I have never seen one as bad as that. I say this with great trepidation because I'm involved currently I think in seven different hydropower projects, and whatever FERC says I have to do. So it is extremely difficult for me to criticize the F-E-R-C, but this is the situation where for

1 reasons best known to FERC they have done an appalling job
2 in numerous ways.
3 The EIS was based on a biological opinion, as we
4 know, and I have commented on that. I would like to
5 resubmit my comments on the biological opinion, if you would
6 be so kind. I think that opinion in itself was deficient,
7 and therefore the staff back in Washington looking that over
8 didn't have much choice but to produce a completely
9 deficient document.
10 The particular areas I would like you to focus on
11 is a matter of scope. The FERC is completely deficient in
12 addressing a federal scope, even though they're a federal
13 agency supposedly interested in national impacts, national
14 perspective, and yet when you examine their documents they
15 almost categorically never extend beyond the Project
16 boundaries. Project boundaries here are a particular
17 problem, because most of the benefits and most of the impact
18 of this Project are outside of the FERC project boundaries.
19 Mr. Parks, I ask you as a representative of the
20 State to focus on State impacts, not necessarily the narrow
21 confines of the Project boundary, but rather what happens
22 downstream, upstream, in the air as a result of the
23 substitute generation, the delays and other alternative
24 energy, the temperatures of the water that get washed
25 downstream, and the biology that is affected by the stream.

As most of you don't know, I'm heavily involved right now in studying genetics and epigenetics, primarily focusing on fish. The primary biologist in this State, who I know very well, Peter Moyle, I asked him, I said Peter, I'm a hydropower developer, I got that tattooed across my forehead, and I talked to Mike and other folks that can't kind of get past that. He said -- I said, with that perspective, Peter, what do I do up here? What can I do -- what is the best thing I can do with this Kilarc Project for the fish? And there's probably nobody in this State that knows better than he, unless someone can correct me, and he said Dick there's no way we're going to go back to pre-man. There is no way we can go back to conditions, no way we want to go back to conditions. What we have to do if we are going to support these fish is do the best we can and with what we got assuming humans are here.

Well, I was offended, because like a lot of people we kind of like to have, you know, if we're -- if we're going to do away with this hydropower project we would like to go back to pristine conditions. Well, that's not how he sees it. He sees very clearly that we have to do the best under the conditions of man being in place. And part of that in place, as he pointed out to me, is this Project, because it already exists.

Returning to the biological -- the comment on the

1 bio-opinion forming the basis, I hope you will extend beyond
2 that and consider outside of the Project boundaries the
3 effects of the Kilarc Project. The temperature of the water
4 is directly affected, it was introduced as physical evidence
5 in the -- in the oral hearings before the F-E-R-C when they
6 came to visit, and very kindly several times it was brought
7 up and presented and completely ignored in their EIS. It's
8 not often in an EIS that you ignore physical evidence. FERC
9 has just done that.
10 I request that you not do that, and instead the
11 primary -- a primary impact of this particular site is to
12 inject downstream cold water below the falls where there's a
13 large amount of habitat, where there are multiple anadromous
14 species, and where we need cold water is the limiting
15 factor, one of the major limiting factors in that area, and
16 it's essentially completely ignored in the EIS.
17 Fire was mentioned. The -- the -- the impact of
18 maintaining those roads, the fire barriers, the availability
19 of water at altitude is essential for maintaining a -- a low
20 level of fire prevalence in the area. Fire makes one hell
21 of a mess in streams and hurts the fish. By reducing the
22 fire prevalence we increase the ability of fish to survive
23 in this area. It would be grateful if that would be -- at
24 least be considered in terms of a -- a thing to be
25 studying.

1 One of the suggestions that has been made, and I
2 would like to reinforce it just at least for discussion, is
3 that the South Cow is quite different than the Kilarc. The
4 issues are quite different. The valid concerns of the
5 people in the South Cow are essentially completely different
6 than those at the Kilarc.
7 I submitted to FERC a request that they basically
8 split the issue and come up with a process that allowed the
9 two -- the two different sites to be addressed separately.
10 I asked that for your consideration as representing the
11 State, or for discussion tonight, there may be -- may be
12 people that object to it, they think it should be handled in
13 one.
14 I think by bringing the two essentially completely
15 different sites into one venue, we complexify the --
16 complexify both the discussion, we complexify the -- the
17 fisheries issues, the study issues, and will probably make
18 much more difficult a unified solution that is optimal in
19 both places.
20 I also asked as part of that in the -- in another
21 filing for the -- for the EIS process to be restarted. I
22 have no interest in complaining about, pounding on the staff
23 back at FERC. It is obviously deadly in my -- in my
24 approach. But for somehow they were given a job of -- of --
25 of handling the data that was submitted through a

consultant -- or from a consultant on this Project, and they basically did not extend that much. I think that was a major mistake. And I again have asked FERC, and perhaps the State could ask FERC to in effect go back and restart the EIS procedure under the aegis of splitting the Project into two different projects. Giving them a path out of that, I would like to resubmit my request for splitting the Project in half.

Finally, I hate being negative. I do not like bashing agency people who are doing the best they can under the conditions that they have to work. I think it's highly destructive, and I don't like to do it, and I find myself in a very distasteful position at this moment.

About two years -- in fact according to the date in front of me, over two years ago we submitted what was called the "Kilarc Project" which had to respond to the area limitations of what would you do in the immediate Project area. As Kelly indicated, that -- that included a lot of sort of research and production and various other things in the canal area, research stuff, laboratories going on in the converted transformer building downstream, and a number of other things within the Project area.

Since then we formed what's called the Kilarc Foundation. And we think that the best use of this facility is a compound use to support both the community, the fish,

and have an outreach through the Foundation, nonprofit institution, to do both research, habitat improvements and restoration statewide, with most of the profits of the facility. These I have discussed with a number of people, I believe yourself, sir, and I think we will be submitting more specific details on that as we go along. We're very open to the structure, we've been talking to different organizations that would -- that would handle that.

I am -- I am -- I'm essentially 70 years old, I'm not interested in a project that's going to be going on for many years. I would like to set up an institution that serves the fish, serves the community, and preserves what we got and benefits the statewide from that -- from that facility.

With that in mind, I would like to resubmit an outline of basically the part of that Project that would gone on within the Project. We will expand that into submission within your -- within your 22nd.

Once again, I thank you for being here. And I thank you possibly if you could to pick up the mantle of the State, represent the community again before FERC. Given the job that they have done, I -- I think under your direction and aegis we have -- we have a better chance than FERC has given us.

Thank you very much for your comments and time.

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MR. PARKS: David Albrecht.

PUBLIC COMMENT PRESENTED

BY DAVID ALBRECHT

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MR. ALBRECHT: Good evening. My name is Dave Albrecht, and I'm a land owner on South Cow Creek. The South Cow Diversion Works resides on our family's property by right of a deeded easement of 1907.

I have given written comments to Jeff Parks tonight, and there is copies of those comments to PG&E, U.S. Fish and Wildlife, Fish and Game, and the National Marine Fisheries. That's basically two pages of text and seven pages of pictorial documentation on the changes at the dam over the last two years since the FERC EIS issued in August 2011.

By 4-22 I will be submitting additional material concerning issues on the dam removal. This is a very general comment, but a successful outcome to any endeavor is dependent on honest and straightforward description of the issues at hand. The basic criteria for doing this should be that those without firsthand knowledge of any particular area can have a reasonable and true understanding of that area and the issues involved.

Like we've had a lot of documentation up to now. Mistakes happen in all documentation. It is a fact of life. However, failure to identify and hard document those errors and -- and put them on a hard copy checklist as to when and how they will be addressed and -- is how mistakes are easily forgotten, swept under the rug, and perpetuated into the next process cycle. This is extremely important with respect to areas where physical infrastructure removal will be undertaken. And even more so in those areas such as the creeks.

I look forward to the CEQA document having such a checklist.

Thank you.

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MR. PARKS: William, is it Fadrell, (pronouncing)?

MR. FARRELL: Is it Farrell?

MR. PARKS: Farrell, sorry. Farrell.

PUBLIC COMMENT PRESENTED

BY WILLIAM FARRELL

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MR. FARRELL: F-A-R-R-E-L-L. Okay.

I too am glad that you are here. We've been going through this for quite sometime. I'm not going to go

into very much detail of what I'd like to be responding to, but I do want you to put a face with the written letter I'm going to be sending you too.

Also my wife and I have 440 acres out there. We have a mile and a half of creek in South Cow Creek. We got nesting Bald Eagles, and if you doubt they aren't there, I'd would like to show them to you, and I'd be happy to take you on a tour. It's a wonderful spawning area that has lots of possibilities. There's lots of environment there thanks to the Abbott Ditch.

So, I will be sending in a written form here soon.

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MR. PARKS: Matt Myers.

PUBLIC COMMENT PRESENTED

BY MATT MYERS

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MR. MYERS: Matt Myers, California Department of Fish and Wildlife, formerly known as the Department of Fish and Game.

So I would like to resubmit our scoping comments so you have them underneath the Fish and Wildlife name. And also verbally state that our position hasn't changed. We still support the 2005 MOU and the PG&E prepared surrender

application. And we'll be submitting comments on draft EIR. And any other further comments we will be submitting by mail.

Thanks.

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MR. PARKS: David White.

PUBLIC COMMENT PRESENTED

BY DAVID WHITE

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MR. WHITE: David White with the National Marine Fishery Service. I'm a FERC Coordinator and a Fish Passage Engineer. I have been involved with this Project since 2003. And we have been submitting our -- our thoughts and reviews of the various alternatives that have been filed in this proceeding, and will -- and have resubmitted several of those documents tonight and would ask that they be included in your review process. We will also be filing written comments in response to the EIR and DEIR.

I -- I just want to say, and keep my comments short because we have submitted them in writing, that the National Marine Fishery Service has carefully and thoughtfully reviewed each of the alternatives that were submitted, and I've spoken with some of you at length and am interested in your thoughts and -- and listen as well as I

can.

From our perspective, the decommissioning plan is the best alternative for maximizing conservation benefits for anadromous fish. So we also have the same position with respect to anadromous fish that we did when we signed the MOU with PG&E for decommissioning.

Thank you.

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MR. PARKS: James Fletter, did you wish to speak?

MR. FLETTER: I just left a document with you.

MR. PARKS: Okay.

Is there anyone else that didn't fill out a card that wishes to speak? No?

MR. RAGAZZI: Yes.

PUBLIC COMMENT PRESENTED

BY ERIK POOLE

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MR. POOLE: My name is still Erik Poole.

I just have three quick areas that I would like to comment on. One is that I appreciate the State Water Board's reexamination of a no action alternative. And I would like to suggest that, not to get too deep into the logic of what "no action" really means, but I would like to suggest that -- that the Board consider the option of PG&E

1 locking the door and walking away from the facility, that
2 accomplishes decommissioning which is the object here that
3 we're all trying to do is get PG&E out.
4 But consider that no action alternative would be
5 either the assumed presence of a new operator, or just a
6 ghost operator that the facility was with going on the way
7 it has been going on, been being operated by PG&E, all other
8 things being equal. That's -- that's the only -- that's the
9 only true no action alternative that I've been able to
10 define for myself in this.
11 This is -- this is a situation where PG&E is
12 trying to remove itself from a very intricate, both
13 physical, and business, and community situation. So I would
14 suggest that -- that for your Board to consider when you're
15 looking for a no action alternative. I think it also gives
16 the best baseline to compare each and every action that is
17 contemplated by PG&E's decommissioning plan against, because
18 there are myriad of actions in this -- in this
19 decommissioning plan. Some -- some well described, some
20 less well described, some not described and -- and hidden
21 due to several reasons.
22 My next two comments are sort of on that. The --
23 I would ask the State Water Resource Control Board when
24 considering scope, to take up fully and completely your role
25 in the -- in the legal and the law aspects of the State of

1 California, as well as the environmental impacts, and so --
2 and water quality side of your -- your Board's mandate.
3 I think that the community tried repeatedly to get
4 FERC to take up the fact that this Project is in a fully
5 adjudicated watershed, and that there were impacts not only
6 to other parties of the adjudication, but to the
7 adjudication itself that weren't contemplated in PG&E's
8 decommissioning plan. And FERC ignored those and claimed
9 that since FERC is a federal body, and that's a California
10 legal issue, they couldn't touch it. It -- it must be
11 considered, and it will be considered one way or another
12 either by the Court's alone, or by the Water Board and the
13 Courts together.
14 That adjudication was created at the behest of the
15 community, and the behest of the State Water Board. The
16 community had problems with water use, the Water Board had
17 to deal with it over and over. The Water Board said, hey,
18 this thing has got to get adjudicated. You wrote a water
19 use and supply report that informed that adjudication, and
20 the adjudication stands today. It's -- it's part and parcel
21 of your Board, it's part and parcel of -- of how this
22 watershed needs to be managed. And it is the fundamental
23 agreement between the community and the -- the water --
24 among the community and the agencies and the State at this
25 point. So please do not -- do not miss this opportunity to

bring it fully into scope, consider it at this point.

The other thing about scope, this was brought up with FERC, and FERC also seemed to ignore this, foreseeable impacts from the proposed decommissioning plan should be considered, not just those impacts that are listed within the decommissioning plan. So there are very simple foreseeable impacts to the -- to the actions contemplated in the decommissioning plan.

For instance, if you no longer divert water from Old Cow or South Cow, all of the environment along the existing canals, around the forebays, any tailrace is significantly impacted. Any use of any of that water that's ongoing now is significantly impacted. FERC severely restricted their scope on this and didn't consider the fact that several hundred acres on the South Cow Project, or adjacent to the South Cow Project area would be severely impacted by the -- the actions considered in the decommissioning plan as it's written.

So those were my three points. And I will also submit further comments in writing before your deadline.

Thank you again for being here today.

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MR. PARKS: All right. Is there anybody else that wishes to speak?

We'll, if that's the case, then I think we're

going to close this meeting. Again, I highly suggest that if anybody has any information that they feel was not included, or that we just don't have, please submit it to us. Feel free to call me. I'm very open to helping anyone provide information to us if they're having trouble. And I will enjoy seeing everybody's comments on the 22nd.

And thank you all for coming tonight.

(The meeting was adjourned at 7:20 p.m.)

STATE OF CALIFORNIA)
) ss.
COUNTY OF SHASTA)

I, CHERYL K. SMITH, Certified Shorthand Reporter, do hereby certify:

That I acted as such Shorthand Reporter in the above-entitled matter; that I took down in shorthand notes the proceedings given and had at said time and place;

That I thereupon caused my stenographic notes to be transcribed by computer-assisted transcribing, and that the foregoing 49 pages constitute a full, true and correct transcript thereof.

DATED: April 22, 2013.

CHERYL K. SMITH, CSR 5257