

# **Executive Summary**



## **EXECUTIVE SUMMARY**

### **APPLICATION FOR LICENSE SURRENDER FOR MAJOR PROJECT – EXISTING DAM**

**Kilarc-Cow Creek Hydroelectric Project, FERC Project No. 606**  
**Pacific Gas and Electric Company (Licensee)**

**March 2009**

#### **ES.1 Overview**

Pacific Gas and Electric Company (PG&E or Licensee) is filing with the Federal Energy Regulatory Commission (FERC) this draft application to surrender its license (Draft License Surrender Application, Application, or DLSA) for its existing 5.0 megawatt installed capacity Kilarc-Cow Creek Hydroelectric Project, FERC Project No. 606 (Project) in compliance with Part 18 of the Code of Federal Regulations, Part 6. The DLSA has been distributed to federal and state resource agencies, local governments, Indian tribes, non-governmental organizations, members of the public, and others likely to be interested in the license surrender proceeding (Interested Parties).

The Project is located on South Cow Creek and Old Cow Creek in Shasta County, California, and consists of two developments (Kilarc and Cow Creek Developments), which collectively include 2 forebays and associated dams; 2 powerhouses; 5 diversion dams; 20 canals, flumes, and tunnels, together with associated spillways; 1 siphon; 2 penstocks; 2 powerhouses with associated tailraces and switchyards and associated equipment; and transmission facilities. PG&E proposes to surrender its license to operate the Project and to decommission Project facilities, as described in the Proposed Decommissioning Plan (Appendix A).

PG&E initially sought a new license for the Project, filing a Notice of Intent (NOI) to relicense the Project with FERC in 2002. However, after performing initial relicensing studies and consulting with resource agencies and other interested parties, PG&E ultimately concluded that the likely cost of providing the necessary level of protection, mitigation, and enhancement for the resources affected by the Project would outweigh the economic benefit of generation at the Project over the life of a new license, and would result in the Project no longer being an economic source of power for PG&E's electric customers. Consequently, in March 2005, PG&E entered into the Kilarc-Cow Creek Project Agreement (Agreement) with resource agencies and other interested parties (Attachment A). Pursuant to 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 agreed to support decommissioning of the Project.

Decommissioning the Project will restore natural streamflows to Old Cow and South Cow Creeks, improving aquatic habitat and benefiting federally threatened steelhead trout and fall-run



Chinook salmon. Decommissioning may improve riparian habitat, benefiting riparian-dependent birds, amphibians, and other species. Perennial flows will no longer be released to Hooten Gulch, and Kilarc Forebay, a local recreational facility, will be decommissioned. Project features that may have historic value will be documented. The Powerhouse structures will be secured and left in place during decommissioning; an option for the future reuse of the structures will be preserved.

The current estimated cost to decommission the Project, including the 31 resource management measures proposed in the DLSA that will provide numerous environmental benefits, is approximately \$14.5 million for the physical decommissioning and post-decommissioning monitoring. Given the importance of the decommissioning of this Project for fall-run Chinook salmon and steelhead, PG&E has developed its proposed resource management measures with resource agencies and Interested Parties (described further below) to assure adequate protection and reasonable enhancement of environmental resources. PG&E anticipates that the relevant proposed resource management measures will be included by the National Marine Fisheries Service (NOAA Fisheries) in its Endangered Species Act (ESA) Biological Opinion (BO) for the protection and enhancement of Chinook salmon and steelhead. The proposed resource management measures focus on controlling erosion and managing sediment related to the physical decommissioning of the Project, including effects on banks and shorelines, water quality, aquatic life, and stream geomorphology. PG&E also responded to Interested Parties' concerns regarding preservation of historic and recreational values of the current Project features by issuing a Solicitation of Interest (SOI) for qualified third parties to own and operate the Kilarc Forebay and Kilarc Powerhouse for future public use as historic and/or recreational facilities. The SOI did not yield any responses from qualified entities.

While PG&E considers the measures proposed in this Application to be its formal proposal, PG&E will continue to consult with Interested Parties throughout the license surrender process. In addition, PG&E plans to file with FERC a Biological Assessment (BA) in mid-2009, which will address Chinook salmon and steelhead. Should additional consultation result in PG&E revising a measure proposed in this Application, PG&E will file the revision with FERC.

PG&E has prepared this Executive Summary to describe and summarize the information contained in the DLSA for the Project. The intent of this Executive Summary is to provide an overview of the major sections of the Application. For additional detail, the reader is directed to the individual sections of the Application. In developing the DLSA, PG&E is also required to file a decommissioning plan with FERC. The development of the decommissioning plan is described below.

## **ES.2 Proposed Decommissioning Plan**

PG&E began development of its decommissioning plan by holding a series of public meetings during the spring and fall of 2007. During the initial meetings, PG&E solicited comments from Interested Parties to assist it in identifying issues with decommissioning of the Project. PG&E used the comments received from Interested Parties, the framework set forth in the Agreement, and environmental, cultural, and recreational resource studies conducted during the initial phase of PG&E's relicensing process to develop its Preliminary Proposed Decommissioning Plan



(PPDP). PG&E presented the PPDP to the Interested Parties in meetings held in September 2007, followed by a 30-day public comment period. Further meetings with Interested Parties were held in November 2007 to discuss the scope of decommissioning and resource issues to be addressed in this DLSA. Based on these meetings, PG&E has finalized its Proposed Decommissioning Plan (PDP), which is attached to the DLSA as Appendix A.

The PDP is based on consultation with Interested Parties, including resource agencies, and landowners; the results of resource studies; and the economic and liability considerations that underlay PG&E's decision to surrender the Project license. PG&E developed its Decommissioning Plan with two main objectives: 1) achieving specific "Desired Conditions" once decommissioning is complete, as identified in the Agreement; and 2) addressing potential resource issues associated with decommissioning the Project. Specific decommissioning actions were developed in consultation with affected landowners.

The PDP is organized as follows:

- **Section 1 – Introduction.** This section provides background information on the Project and events to date related to the decommissioning process; a summary of the development; rationales and consultation for the decommissioning plan and the DLSA.
- **Section 2 – Decommissioning Proposal.** This section describes the Project features and proposed decommissioning actions for each feature. The section also provides information on potential environmental effects associated with decommissioning activities and the final disposition of the facilities after decommissioning.

### **ES.3 Summary of Application**

#### **ES.3.1 Initial Statement**

The Initial Statement presents PG&E's Draft Application for Surrender of License for Major Project, and Statement Pursuant to 18 CFR Section 4.32. The Draft Application for Surrender of License provides information required by FERC.

#### **ES.3.2 Contents**

The application is composed of one volume. The volume contains the following components:

- A Table of Contents, including a list of tables and figures;
- A Glossary of Terms, Abbreviations, and Acronyms that are used frequently in the application;
- This Executive Summary;
- An Initial Statement;
- Exhibit A – a description of the proposed Project;
- Exhibit B – a description of Project operations and resource utilization



- Exhibit C – a description of Project history and the proposed decommissioning schedule;
- Exhibit D – a statement of cost and financing;
- Exhibit E – the Environmental Report, which includes: a) an introduction; b) a description of the potentially affected environment by resources area; c) a description of potential Project impacts by resources area; d) a description of environmental PM&E measures for the Project; and e) a list of cited literature;
- Exhibit G – Project Maps.

### **ES.3.3 Glossary**

The Glossary of Terms is provided after the Table of Contents in the application. The glossary includes definition of terms used in the application including acronyms.

### **ES.3.4 Exhibit A – Project Description**

The Project is located in Shasta County, California, approximately 30 miles east of the city of Redding, near the community of Whitmore. The Project consists of two developments constructed between 1904 and 1907: the Kilarc Development on Old Cow Creek and the Cow Creek Development on South Cow Creek. Old Cow and South Cow Creeks are part of the Cow Creek Watershed. Old Cow Creek is a tributary to South Cow Creek and South Cow Creek is a tributary to Cow Creek. Cow Creek drains to the Sacramento River. The Kilarc Development diverts water from North and South Canyon Creeks and Old Cow Creek. The Cow Creek Development diverts water from Mill Creek and South Cow Creek.

Water diverted for power generation is conveyed to the Kilarc and Cow Creek forebays, where penstocks direct the water to the respective powerhouses. The Project comprises several small diversion dams, approximately 7 miles of water conveyance facilities, and two powerhouses with a total installed capacity of 5 megawatts.

Exhibit A summarizes the PDP, described above and in Appendix A to this DLSA.

In general, treatment of facilities is proposed as follows:

- Diversion dams will be removed to stop water diversions and to allow for free passage of fish and sediment.
- Dam abutments may be left in place to protect stream banks.
- Powerhouse structures will be secured and left in place during decommissioning; an option for future reuse of the structures will be preserved.
- Electric generators, turbines and other equipment will be removed.
- Forebays will be graded and filled.
- In consultation with affected landowners, canal segments will be left in place, breached, or filled. Flumes will be removed.



**Table ES-1. Decommissioning Activities**

Description of Decommissioning Activity	Forecast Range of Dates	
	Start	End
PG&E files final LSA with FERC	03/2009	–
FERC prepares EA report	03/2009	09/2009 to 03/2011
SWRCB prepares CEQA report		
FERC issues order to decommission	12/2009 to 06/2011	–
PG&E develops detailed engineering plans	12/2009 to 06/2011	06/2010 to 06/2013
PG&E develops detailed management plans		
PG&E obtains permits for decommissioning		
PG&E decommissions Project	06/2010 to 06/2013	06/2013 to 06/2016
PG&E conducts post-decommissioning monitoring	06/2014 to 06/2016	06/2019 to 06/2021
FERC approves decommissioning	06/2019 to 06/2021	–

**ES.3.4.1 Desired Conditions upon Decommissioning**

The PDP contains an attachment (Attachment A, Project Agreement) that lists subjects to be addressed through the decommissioning process (e.g., the disposition of canals). For each of these subjects, the Agreement lists “Desired Conditions,” (Desired Conditions) such as, for example, stable drainage of runoff. The Desired Conditions are intended to help frame how the subjects are addressed in decommissioning. PG&E considered these Desired Conditions in developing its decommissioning plan for the Project facilities. PG&E also identified potential resource issues associated with decommissioning Project facilities and addresses those issues in its decommissioning plan. The Desired Conditions are summarized in Exhibit A by Project feature, and the potential resources issues are described in Exhibit E (Environmental Report).

**ES.3.5 Exhibit B – Project Operations and Resource Utilization**

The Project is located in two separate drainage areas, Old Cow Creek (Kilarc Powerhouse) and South Cow Creek (Cow Creek Powerhouse). Kilarc Powerhouse is supplied with water diverted from North Canyon Creek, South Canyon Creek, and Old Cow Creek. Cow Creek Powerhouse is supplied with water diverted from Mill Creek and South Cow Creek. Both developments operate as run-of-river facilities. Water conveyance systems convey water to the forebays of the respective powerhouses, where it flows into the penstocks of each powerhouse and is then returned to the creeks downstream.

The average yearly runoff at the Kilarc Main Canal Diversion Dam is 48,900 acre-feet, about 55 percent of which is diverted to the Kilarc Powerhouse. The average annual runoff at the Cow



Creek Diversion Dam is 79,500 acre-feet; about 37 percent of which is diverted to Cow Creek Powerhouse.

The Project has a total installed capacity of 5 megawatts and an estimated dependable capacity<sup>1</sup> of 1.6 megawatts (1.2 megawatts from Kilarc, 400 kilowatts from Cow Creek). Annual energy production for the two developments averaged 31.1 million kilowatt-hours over the 25-year period from 1977 to 2001.

PG&E historically used Project power to meet the needs of its electric customers. The Project is an “eligible renewable energy resource” under California’s Renewables Portfolio Standard (RPS), which requires that 20 percent of an electrical corporation’s retail sales be procured from eligible renewable energy resources no later than December 31, 2010. In order to replace the reduced electricity production of the Project, another source of renewable electrical energy would need to be obtained. Lower cost, air-emission-free, and RPS-eligible renewable energy is forecast to be available to replace it.

PG&E proposes to discontinue operating the Project in accordance with its PDP (Appendix A).

### **ES.3.6 Exhibit C – Project History and Proposed Decommissioning Schedule**

The Northern California Power Company (NCPC) constructed the Kilarc Powerhouse in 1903 and 1904. Between 1903 and 1907, the NCPC also constructed several canals, the penstock and forebay, and a 20-kilovolt wood pole line serving the powerhouse. Northern Light and Power Company (NLPC) constructed Cow Creek Powerhouse in 1907.

NCPC purchased the NLPC in 1912 after it became part of the Sacramento Valley Power Company. PG&E acquired the NCPC in 1919. PG&E has since operated and maintained the Project.

On March 23, 2007, PG&E filed a proposed Surrender Schedule with FERC, which approved it on June 11, 2007. The approved schedule requires PG&E to file with FERC an LSA, including a decommissioning plan, by March 26, 2009. A PDP, revised based on comments received during the public comment period, is included in this DLSA as Appendix A.

After a 60-day public comment period on this DLSA, PG&E will finalize the LSA and file it with FERC in March 2009. Upon acceptance of the LSA, FERC will undertake an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) and will consult with federal and state resource agencies under the Endangered Species Act (ESA). The State Water Resources Control Board (State Water Board) may initiate a California Environmental Quality Act (CEQA) review prior to issuing a Water Quality Certification for the decommissioning activities pursuant to Section 401 of the federal Clean Water Act (CWA).

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<sup>1</sup> Dependable capacity is based on the Project’s load carrying ability during the critical hydrologic period (e.g., 1977) coincident with the PG&E’s peak electric system load in July or August.



PG&E anticipates that the FERC EA, federal and state consultations, and State Water Resources Control Board (SWRCB) and CEQA processes will be completed within six months to two years after PG&E files its LSA. PG&E expects that FERC will issue an Order approving PG&E's LSA between 2009 and 2011. Based on this Order, PG&E will develop detailed engineering and management plans for removal of the Project facilities. After FERC approves these plans and after PG&E obtains any other required permits, PG&E anticipates commencing decommissioning activities between 2010 and 2013. It is expected that removal of the Project facilities will take three years, followed by two to five years of maintenance and monitoring of the site restoration work.

### **ES.3.7 Exhibit D – Statement of Project Cost and Financing**

The net book value of the Project, which is the historical cost less accumulated depreciation, is estimated to be approximately \$5 million.

The preliminary estimated cost for decommissioning the Project is \$14.5 million. This figure includes costs associated with the preparation and filing of the LSA, decommissioning costs, and post-decommissioning monitoring costs. Once the Project is decommissioned and electricity production ceases, PG&E will purchase replacement power from the market. Any reduced electricity production of the Project would need to be replaced by another source of renewable electrical energy. The 20-year levelized<sup>2</sup> 2009 “Market Price Referent,” estimation of the long-term market price of electricity is estimated to be \$0.096 per kilowatt-hour.<sup>3</sup>

### **ES.3.8 Exhibit E – Environmental Report**

#### **ES.3.8.1 Introduction (Section E.1)**

Exhibit E presents the Environmental Report for the Project DLSA. The Environmental Report is divided into three major sections: Affected Environment (Section E.2), Project Impacts (Section E.3), and Protection, Mitigation, and Enhancement (PM&E) Measures (Section E.4). Within each section, the environmental and cultural resources of the Project Area are addressed in the following order: geology and soils, hydrology and water resources, geomorphology, water quality, aquatic resources, wildlife resources, botanical resources, historical resources, archeological resources, recreation, aesthetics, and land use.

#### **ES.3.8.2 Affected Environment (Section E.2)**

The Affected Environment is briefly described in this section for the Project.

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<sup>2</sup> The present value of the total cost of building and operating a generating plant over its economic life, converted to equal annual payments. Costs are levelized in real dollars (i.e., adjusted to remove the impact of inflation).

<sup>3</sup> CPUC adopted 2007 Market Price Referent dated October 4, 2007.



## **Geology and Soils**

The section is divided into geologic, seismic, and soil analyses. The Project is in the Cascade Range geomorphic province and occupies the eastern half of the Cow Creek Watershed, including the headwaters of South Cow Creek and Old Cow Creek. The most wide-spread rock type in the Cascade Range province is the volcanic Tuscan Formation. There are no known or mapped active faults within the Project Area as defined by the Alquist-Priolo Earthquake Fault Zoning Act. Records indicate earthquakes in the range of magnitude 5.0 on the Richter Scale occurring within the Lassen Peak area in 1936, 1945, 1946, 1947, and 1950. In general, the soils in the vicinity of Project facilities are stony and rocky loam, typically composed of weathered volcanic or sedimentary rock. The thickness of soil over the upper bedrock surface varies, but in general is less than 5 feet.

## **Hydrology and Water Resources**

Surface water flow in the Cow Creek watershed is derived from snow falling in the upper reaches of the watershed and rainfall in the lower- and mid-watershed elevations. Water is diverted from the springs and creeks of the Cow Creek watershed to serve agricultural, domestic, and power production needs. PG&E holds four pre-1914 water rights for electricity generation and domestic use in the Old Cow Creek<sup>4</sup> watershed for the Kilarc Development. PG&E holds two pre-1914 water rights for electricity generation in the South Cow Creek watershed for the Cow Creek Development.

## **Geomorphology**

Measurements of morphological parameters were made on Old Cow Creek, South Cow Creek, and Hooten Gulch during the 2003 relicensing studies. Within the Kilarc Development area, Old Cow Creek, South Cow Creek, and Hooten Gulch are A- and B-channel types with steep gradients and cobble, boulder, cobble-gravel, and boulder-cobble representing the dominant bed material. Most of Old Cow Creek, South Cow Creek, and Hooten Gulch were identified as predominantly alluvial channel types. Field observations frequently revealed short segments of the diverted reaches, usually less than 500 linear feet, dominated by bedrock interspersed between the alluvial reaches. Channel bank stability was high along South Cow Creek, moderate to low on Old Cow Creek, and moderate below the Cow Creek Powerhouse on Hooten Gulch below the respective diversions.

The frequency and amount of in-channel sediment storage was very low for all Project bypass reaches. Overall, fine sediment present in pools above and below the Kilarc Main Canal Diversion Dam and South Cow Creek Diversion Dam was very low, whereas Hooten Gulch had a much greater amount of fine sediment covering the bed surface area. Most of the sediment stored behind the Kilarc Main Canal Division Dam and South Cow Creek Diversion Dam is gravel or cobble to boulder-sized material. Following their removal, the total volume that has

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<sup>4</sup> The names Old Cow Creek and North Cow Creek are used interchangeably in the Water Rights discussions for Old Cow Creek.



the potential to be scoured and transported downstream is estimated to be about 580 cubic yards (0.36 acre-feet) and 1,400 cubic yards (0.87 acre-feet), respectively.

### **Water Quality**

The *Fourth Edition Water Quality Control Plan* (Basin Plan) identifies the following beneficial uses for the Cow Creek hydrologic area: agricultural irrigation, stock watering, power generation, contact-water recreation, other non-contact recreation, cold freshwater aquatic habitat and migration habitat, warm and cold water spawning habitat, and wildlife habitat. The Basin Plan also identifies municipal and industrial water supply, and canoeing and rafting as potential designated uses. When compared to the Basin Plan, national, and California standards, water quality had minor exceedances of the fecal coliform observed in the Kilarc and Cow Creek developments, which were likely from cows, native mammals, or other animals with access to the stream. Measured metal, nutrient, PCBs, and mineral parameters did not exceed these criteria. Sediment behind the Kilarc Main Canal Diversion Dam was found to exceed the Threshold Effects Level (TEL), but was generally lower than the Probable Effect Level (PEL) for copper. *In situ* water quality measurements yielded nominal exceedances for pH, but water temperature, specific conductance, dissolved oxygen, and turbidity were generally within acceptable ranges for both the Kilarc and Cow Creek developments. Mean daily temperatures generally remained below 18°C throughout the Old Cow Creek Project-affected bypass reach, even during the warmest part of the year (late July). However, mean daily water temperatures measured in 2003 could have exceeded Basin Plan temperature objectives in the Kilarc Development, but met the Basin Plan temperature objective in the Cow Creek Development. Water temperatures were warmer in South Cow Creek, generally exceeding maximum daily temperatures of 18 and 24°C in the summer.

### **Aquatic Resources**

The Cow Creek watershed supports populations of anadromous salmonids, as well as native and introduced resident species (SHN, 2001). Resident species common to Old Cow and South Cow creeks are rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), and riffle sculpin (*Cottus gulosus*). South Cow Creek below Wagoner Canyon also supports numerous other native and introduced resident species. In addition, South Cow Creek supports several species of anadromous fish, including fall-run Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*O. mykiss*), and lamprey (species unknown, but likely Pacific lamprey, *Lampetra tridentata*). Two runs of anadromous salmonids that may occur within the Project Area are either listed or have been considered for listing under the federal ESA. These include the Central Valley Steelhead population unit, Central Valley fall- and late fall-run Chinook salmon population unit. Additionally, stray Central Valley Spring-Run Chinook salmon have been observed on Cow Creek, but Cow Creek and its tributaries are not known to support a population of this run. Critical habitat has been designated by NOAA Fisheries in the Cow Creek watershed for the Central Valley Steelhead population unit.



### **Wildlife Resources**

Using the California Natural Diversity Database (CNDDDB), United States Fish and Wildlife Service (USFWS) species list (USFWS, 2003; USFWS 2008), and observations during Project surveys, potentially suitable habitat for 31 special-status wildlife species exists within the Kilarc and Cow Creek developments: 1 invertebrate, 2 amphibians, 1 reptile, 17 birds, and 10 mammals. Exhibit E includes the location of the suitable habitat by species and an assessment of the potential for occurrence for each species. Special-status species observed during Project or other surveys, and/or habitat to support them, include the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Foothill yellow-legged frog (*Rana boylei*), northwestern pond turtle (*Actinemys marmorata marmorata*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), the American peregrine falcon (*Falco peregrinus americana*), and Lewis' woodpecker (*Melanerpes lewis*).

### **Botanical Resources**

Based on a literature review, 29 special-status species could potentially occur in the Project Area. Two special-status species, mountain lady's slipper (*Cypripedium montanum*) and big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*) were observed within the Project Area during the 2003 or 2008 surveys. Fritillaries were observed along Kilarc Penstock and at several locations along the South Cow Creek Main Canal and the slopes above South Fork Cow Creek during the 2003 survey. It was thought that some of the fritillaries found in 2003 might have been Butte County fritillary (*Fritillaria eastwoodiae*); however, studies in 2008 found only scarlet fritillary (*Fritillaria recurva*) in the Cow Creek Development. Two stems of mountain lady's slipper (*Cypripedium montanum*) were growing at the base of an above-ground reach of the Kilarc Main Canal in 2003, at the top of a steep, bare slope failure. A population of big-scale balsamroot was found at a proposed temporary access road site (Figure E.2.6-1, Map 2).

### **Historical Resources**

The architectural Area of Potential Effect (APE) includes the entire built environment and is defined as the area within the FERC Project boundary and a 100-foot buffer zone outside the boundary. The local history within the APE, and more broadly, within Shasta County, is characterized by the California gold rush and later copper mining, agriculture, and hydroelectric power generation. The known architectural and historic resources in the APE include water system facilities and settlements. Based on record searches, historic research, field surveys, and resource evaluations conducted for the proposed Project, the Kilarc and Cow Creek powerhouses are eligible for listing in the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR). The other Project facilities have not retained sufficient integrity of design, setting, workmanship, materials, feeling, and association to be eligible for listing individually or as historic districts in the NRHP or CRHR.

### **Archaeological Resources**

The archaeological APE is the entire Project Area within the FERC Project boundary where actual ground disturbing activities may occur. Archaeological evidence indicates that the



prehistory of northeast California extends at least as far back as 12,000 to 13,000 years ago (McGuire, 2007). The Project Area lies within the territory occupied by the Central Yana people at the time of European contact. The record searches, archival research, field surveys, and resource evaluations conducted for the proposed Project identified archaeological resources such as lithic scatter sites in the APE, but none are recommended for National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) eligibility.

### **Recreation**

Within the Project Area, the Kilarc Forebay is the only location where formal recreation facilities are provided. There are comparable recreation opportunities available at nearby reservoirs. The Kilarc Powerhouse has a grassy lawn that the public currently uses informally for picnicking and fishing access. Other lands within the Project Area are comprised of private lands not open to the general public and PG&E lands which are not easily accessible (e.g., no road access, heavily forested, steep hillsides); these lands do not have recreation facilities (e.g., restrooms, picnic tables) or attributes that draw recreation users (e.g., accessible creeks or reservoirs).

### **Aesthetics**

The Project Area encompasses a range of scenery, varying from the narrow and steep river canyons and densely vegetated river banks with conifer forests in the upper watershed, to open rolling foothills with grasses and oak and pine trees with a sparse and scattered overstory in the lower watershed. The Kilarc Powerhouse and Kilarc Forebay are located in areas that are used by the public and contain visual resources. The Cow Creek Powerhouse and associated facilities are not accessible or easily viewed by the public and therefore are not considered aesthetic resources. No Project facilities are within the viewshed of officially designated or planned scenic highways.

### **Land Use**

A total of 187.13 acres of land are located within the FERC Project boundary. These lands are owned by PG&E (approximately 113.62 acres) and private landowners (approximately 66.18 acres). The United States, under the jurisdiction of the Bureau of Indian Affairs holds in trust approximately 3.93 acres of land underlying the Cow Creek Penstock for which PG&E has acquired rights for Project purposes. Surrounding land uses outside of the Project Area currently include National Forest, hydroelectric Project facilities, transportation systems, recreation, and conservation. Shasta County designates the Project Area as Timber Production, Exclusive Agricultural, and Unclassified lands. Permitted uses include timber production, watershed management, recreation, agriculture, forest management, open space, and other uses. The Project Area is also classified as a “Very High” Fire Hazard Severity Zone.

### **ES.3.8.3 Project Impacts (Section E.3)**

Potential impacts from Project decommissioning are summarized in this section.



## **Geology and Soils**

Decommissioning of the diversion dams, canals, spillways, tunnels, and forebays may potentially result in stream bank erosion and subsequent sedimentation. Erosion of access roads and staging areas throughout the Kilarc and Cow Creek developments could also occur. The increased use of access roads or improvement of access roads for decommissioning could cause small landslides. Liquefaction is not expected to occur as a result of decommissioning activities. Potential wildland fires caused by construction activities during decommissioning could increase erosion in the Project Area.

## **Hydrology and Water Resources**

Stream flow would increase below the Kilarc Main Canal and Cow Creek diversion dams with the decommissioning of the Project features. The natural daily and seasonal flow regime would be restored to the bypass reach downstream from the diversions. Additionally after decommissioning, the full natural geomorphically-significant peak flows would be nearly the same as under past Project operations, increasing only slightly. Therefore, no impacts would be associated with restoring the peak flows or restoring the unimpaired daily and seasonal flow regime.

Following the decommissioning process, Hooten Gulch down to the confluence with South Cow Creek would be returned to an ephemeral channel condition and artificial flows from diversion of water to, and discharge of water from, the Project facilities into Hooten Gulch no longer would occur. Water users who currently divert water discharged from the Cow Creek Powerhouse into Hooten Gulch will no longer be able to do so. These water users will have to develop alternate points of diversion. PG&E is consulting with water users potentially impacted by the cessation of artificial flows to Hooten Gulch regarding the development of potential alternate points of diversion.

There are eleven wells in the vicinity of Kilarc Forebay. PG&E contacted well owners to document existing well conditions, but has currently received no responses. 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 with any well owners who claim post-decommissioning effects on well levels or yields from discontinuation of the artificial flows regarding alternatives.

Any impacts of decommissioning on existing water rights are appropriately addressed under state law and not through the federal license surrender process.

## **Geomorphology**

Although the stored sediment behind the Kilarc Main Canal Diversion Dam and South Cow Creek Diversion Dam can be released from storage and allowed to naturally transport downstream without adversely impacting channel morphology over the long-term, there would likely be some short-term deposition of sediments in pools and across the channel bed immediately downstream of each dam. The only pools not expected to re-form are the plunge



pools immediately downstream of each dam face. The remaining pools downstream would fill with sediment temporarily and would extend downstream from the respective dam locations for about 10 bankfull widths (approximately the first 400 to 600 feet downstream). There are no impacts associated with sediment disposition following the removal of the Mill Creek, North Canyon Creek, and South Canyon Creek diversions.

Localized bank erosion may occur following the removal of the South Cow Creek Diversion Dam and Kilarc Main Canal Diversion Dam at the former dam sites. Dam removal would create a knickpoint in the channel bed at the former dam site, which would cause headward erosion and downstream transport of the formerly impounded sediments. The relative potential for adverse bank erosion associated with removal of the Kilarc Main Canal Diversion Dam is not significant. The most likely area where unstable banks and erosion could occur is nearer to the South Cow Creek Diversion Dam site where there is a maximum 16 foot sediment depth that would be evacuated. Minimal bank erosion is expected at the North and South Canyon Creek Diversion Dams, and Mill Creek Diversion Dam and little to no adverse effects to the vertical channel stability or to bank stability would likely occur.

Bank instability and erosion downstream from the Cow Creek Powerhouse in Hooten Gulch would most likely be less following decommissioning. Cessation of augmented flows at the powerhouse would not alter the sediment recruitment process from streambanks/hillslopes above the powerhouse, or transport of sediments with episodic high flows. Therefore, no bank/channel stability impacts to Hooten Gulch would result from decommissioning.

### **Water Quality**

The primary potential impact to water quality from Project decommissioning is from increased turbidity in the streams as a result of the deconstruction activities, or from long-term erosion and sedimentation after deconstruction is completed. No other potentially adverse impacts to water quality are expected. The copper found within the fine sediments behind the Kilarc Main Diversion Dam is believed to be a result of natural weathering processes. The source of the copper is from within naturally occurring soils and rock within the watershed and not from anthropogenic sources. Therefore, sediments could be allowed to remain in the channel to be naturally transported downstream after the Kilarc Main Canal Diversion Dam is removed for the decommissioning. Turbidity and fecal coliform levels are expected to decrease with the increase in flow in South Cow Creek.

### **Aquatic Resources**

Deconstruction activities will likely cause short-term impacts to aquatic habitat and affect fish present during the deconstruction activities. However, the removal of Project features and the cessation of diversions from the Project streams will return the streamflows to a more natural state and result in long-term benefits for the aquatic species in Project streams.

Potential impacts include potential lethal effects associated with shockwaves associated with breaking down Project diversion dams (i.e., Kilarc Main Canal Diversion Dam, South Cow Creek Diversion Dam), potential crushing from operation of heavy equipment in Project streams,



sedimentation effects associated with the removal of this material from the diversion dams and removal of the gates and other headwork structures, and potential fish passage impediments. The release of the sediment stored behind the diversion dams could potentially have short-term effects associated with the release of the fine sediment fraction of these sediments, and short- and long-term benefits associated with the release of the spawning gravel sized material.

### **Wildlife Resources**

Most potential Project-related impacts to wildlife resources are the loss of habitat associated with decommissioning Project features. Habitat for amphibians and turtles may potentially be lost with the decommissioning of the diversion dams (i.e., South Cow Creek Diversion Dam) and the Kilarc and Cow Creek Forebays. Additionally, foraging and nesting habitat for raptors and nesting birds could be adversely impacted at the Kilarc and Cow Creek Forebays. Bats could potentially be adversely impacted if they use Project tunnels or the Kilarc and Cow Creek Powerhouses for roosting habitat. Decommissioning activities on access roads could potentially disturb nesting birds. Construction activities could result in injury (including as a result from noise) or mortality to amphibians, turtles, nesting birds, bats, valley elderberry longhorn beetle, and Pacific fisher. No impacts to wildlife are expected from the decommissioning of the Kilarc and Cow Creek Penstocks.

### **Botanical Resources**

Project-related impacts to vegetation communities are not expected to be adverse and would occur from temporary loss of vegetation associated with decommissioning of Project features. Small seeps and wetlands would be affected, but no substantial impacts would be expected. The mountain lady's slipper population adjacent to the Kilarc Main Canal consisted of two plants growing at the base of an above-ground reach of the canal, at the top of a steep, bare slope failure. Decommissioning activities at this portion of the canal would cause unavoidable impacts to this population, but the loss of a few individuals of a watch list species is not considered an adverse impact. The population of big-scale balsamroot located adjacent to the access road in the Cow Creek Development could sustain minor impacts, but big-scale balsamroot could possibly be avoided.

### **Historical Resources**

The Project would result in the decommissioning and disposition of the Kilarc and Cow Creek Powerhouses, penstocks, water conveyance canals, the diversion dams, flumes, forebays, and other ancillary buildings and structures within the Project APE. The Kilarc and Cow Creek Powerhouses are the only structures and buildings eligible for the NRHP and the CRHR within the Project APE. Decommissioning of the Kilarc and Cow Creek Powerhouses would cause a substantial adverse change in the significance of these NRHP- and CRHR-eligible structures.

### **Archaeological Resources**

Five identified sites have a prehistoric archaeological component within the APE and one historical archaeological site has not been evaluated for its potential eligibility for listing in the



NRHR or CRHR. The proposed decommissioning activities do not pose potential impacts to these resources except in the case of two newly identified lithic scatters along proposed access roads or at the locations of the other archaeological resources identified during the investigation. However, there is a possibility of encountering previously undiscovered archaeological resources and having impacts due to ground disturbance. There is also the potential of encountering human remains either in association with prehistoric occupation sites or separately.

### **Recreation**

Project facilities would be deconstructed with the affected areas allowed to naturally re-vegetate. With the removal of the Kilarc Forebay and the associated recreational facilities, the site would no longer serve as a recreational resource. However, ample recreational alternatives exist at a variety of comparable sites. The loss of the land adjacent to the Kilarc Powerhouse as a recreational resource is considered a minimal impact due to the site's relative lack of visitation and associated public facilities. Public access to the grassy terrace beside the building and along Old Cow Creek would remain intact during decommissioning.

### **Aesthetics**

Two Key Observation Points (KOPs) were identified during Project Area field visits. KOP 1 is a point directly north of Kilarc Powerhouse on East Fern Road, from which the powerhouse and switchyard are clearly visible, and KOP 2, which overlooks the Kilarc Main Canal Diversion Dam and Forebay to the northwest from Kilarc Forebay Day Use Area. The decommissioning of the Project facilities described above would be visible from KOPs 1 and 2 and thus affect aesthetic resources associated with the Project, namely the Kilarc Powerhouse and the Kilarc Forebay. During the decommissioning, the Kilarc Powerhouse building structure would be secured by installing a wire mesh or wooden boards across the windows to restrict public access to the building. Considering the building's location within the larger landscape and its visibility from KOP 1, this visual change would constitute a weak contrast with the existing condition. While the contrast of these changes with the existing conditions would be considered moderate to strong from KOP 2, the return of the area to a natural condition would improve the natural aesthetics of the forebay area. Furthermore, as access to Kilarc Forebay is through private property, Kilarc Forebay would no longer be publicly accessible and would no longer be considered an aesthetic resource.

### **Land Use**

The Project facilities represent an established land use in the Project area and do not conflict with any other developed or planned use. Decommissioning of Project facilities would not conflict with the General Plan, Zoning Plan, or other relevant plans and policies because Shasta County would not require a formal land use designation change with this application. The Shasta County General Plan (2004) and Zoning Plan (2003) have no specific policies or guidelines regarding the Kilarc-Cow Creek Project facilities, and decommissioning the Project facilities presents no policy or physical land use conflicts with the General Plan or Zoning Plan. In addition, the Desired Conditions described in Section A.3 would be achieved and would address public safety and land use issues. However, the use of construction equipment and temporary onsite storage



of diesel fuel could pose a wildland fire risk in the Project Area, which would result in conflicts with CAL FIRE’s Fire and Resource Assessment Program requirements.

In order to facilitate the disposition of a portion of the Cow Creek Penstock as proposed in the PDP, PG&E is exploring the option of acquiring the land rights associated with the 1.79 acres held in trust by the United States under the jurisdiction of the Bureau of Indian Affairs. Pursuant to 18 CFR Section 6.2, where Project works have been constructed on lands of the United States PG&E must restore all lands to a condition satisfactory to the department having supervision over those lands when decommissioning is complete. No additional changes to land ownership are expected as a result of the decommissioning.

**ES.3.8.4 Protection, Mitigation, and Enhancement (PM&E) Measures (Section E.4)**

PG&E’s proposed PM&E measures and implementation schedule are listed in Table ES-2.

**Table ES-2 Proposed Protection, Mitigation, and Enhancement (PM&E) Measures and Implementation schedule**

<b>PG&amp;E’s Proposed Protection, Mitigation, and Enhancement Measures</b>	<b>Year to be Implemented</b>
<b>GEOLOGY AND SOILS</b>	
PM&E Measure GEOL-1: Implement Soil Erosion and Sedimentation Control Best Management Practices	
PM&E Measure GEOL-2: Implement Stormwater Pollution Prevention Best Management Practices	
PM&E Measure GEOL-3: Prepare and Implement Professional Engineering Design Plans and Specifications	
PM&E Measures FIRE-1 to FIRE-4 will be Implemented.	
<b>HYDROLOGY</b>	
No PM&E Measures are Proposed	
<b>GEOMORPHOLOGY</b>	
PM&E Measure GEOM-1: Sediment Release Measures will be Implemented.	
PM&E Measure GEOM-2: Bank Erosion Measures will be Implemented.	
PM&E Measure GEOL-1 will be Implemented.	
<b>WATER QUALITY</b>	
PM&E Measures GEOL-1 and GEOL-2 will be Implemented.	
<b>AQUATIC RESOURCES</b>	
PM&E Measure AQUA-1: Isolate Construction Area	
PM&E Measure AQUA-2: Conduct Fish Rescue in Instream Work Area	



**Table ES-2 Proposed Protection, Mitigation, and Enhancement (PM&E) Measures and Implementation schedule**

<b>PG&amp;E's Proposed Protection, Mitigation, and Enhancement Measures</b>	<b>Year to be Implemented</b>
PM&E Measure AQUA-3: Avoid Sensitive Periods for Steelhead and Chinook Salmon for the Removal of South Cow Creek Diversion Dam	
PM&E Measure AQUA-4: Meet NOAA Fisheries Passage Guidelines for Anadromous Salmonids	
PM&E Measure AQUA-5: Consult with CDFG	
PM&E Measure AQUA-6: Conduct Fish Rescue in Canals and Forebays, as Needed	
PM&E Measure AQUA-7: Retain Fish Screen in South Cow Creek Main Canal	
PM&E Measure AQUA-8: Discontinue Cow Creek Powerhouse Operations in Spring	
PM&E Measure GEOM-1 will be Implemented.	
<b>WILDLIFE RESOURCES</b>	
PM&E Measure WILD-1: Conduct Pre-Construction Surveys for Amphibians, Pond Turtles and Nesting Birds	
PM&E Measure WILD-2: Conduct Pre-Construction Surveys for Raptors	
PM&E Measure WILD-3: Conduct Pre-Construction Surveys for Elderberry Shrubs and Bats	
PM&E Measure WILD-4: Exclude Wildlife from Tunnels	
<b>BOTANICAL RESOURCES</b>	
PM&E Measure BOTA-1: Prepare and Implement a Mitigation and Monitoring Plan (MMP)	
PM&E Measure BOTA-2: Conduct Pre-Construction Surveys	
PM&E Measure BOTA-3: Avoid Special-Status Plants to the Extent Possible and Restore Habitat Conditions	
<b>HISTORICAL RESOURCES</b>	
PM&E Measure HIST-1: Documentation	
PM&E Measure HIST-2: Securing Buildings	
<b>ARCHAEOLOGICAL RESOURCES</b>	
PM&E Measure ARCH-1: Archaeological Resources Summary	
PM&E Measure ARCH-2: Unanticipated Archaeological Sites	
PM&E Measure ARCH-3: Encountering Human Remains	
<b>RECREATION RESOURCES</b>	
PM&E Measure REC-1: Solicitation of Interest to Recreational Operators	



**Table ES-2 Proposed Protection, Mitigation, and Enhancement (PM&E) Measures and Implementation schedule**

<b>PG&amp;E's Proposed Protection, Mitigation, and Enhancement Measures</b>	<b>Year to be Implemented</b>
PM&E Measure REC-2: Advertise Recreational Resources on Website	
<b>AESTHETICS</b>	
No PM&E Measures are Recommended	
<b>LAND USE</b>	
PM&E Measure FIRE-1: Spark Arrestors	
PM&E Measure FIRE-2: Fire Suppression Equipment	
PM&E Measure FIRE-3: Flammable Materials	
PM&E Measure FIRE-4: Portable Gas-Powered Tools	

**Geology and Soils**

**PM&E Measure GEOL-1: Implement Soil Erosion and Sedimentation Control Best Management Practices**

PG&E will identify and implement Soil Erosion and Sedimentation Control Best Management Practices (BMPs) that will address soil erosion impacts that may occur both during and after decommissioning construction work.. It is anticipated that monitoring during decommissioning construction activities will be conducted for one year to evaluate the effectiveness of erosion/sedimentation control BMPs that are not enacted instream; instream monitoring will be conducted for two years post-construction. The Project will be designed to develop and maintain geomorphically-stable stream channels above, below, and at the diversions, and also will be designed to prevent contributions of sediment to drainages and streams.

Potential erosion sites will be identified and an assessment will be conducted to determine whether specific BMPs are necessary at the time of construction. If, for example, stabilization measures are warranted, PG&E will design BMPs to protect the banks at dam abutments and diversion canal intakes during high flow events. A monitoring assessment will be performed the first two years after dam removal (See PM&E Measure GEOM-2).

All natural drainage paths along the canals and tunnel will be identified during pre-construction surveys. Slopes prone to instability will be identified, and site specific BMPs will be adopted to avoid potential slope erosion and increased sedimentation in streams during construction activities.



Removal of the canals, diversions, and impoundment structures will be followed by BMPs such as restoration of natural drainage paths, and recontouring of slopes to match pre-existing slope morphology, as feasible. Revegetation will be implemented to increase bank stability (See PM&E Measure BOTA-1).

Potential erosion of access roads and staging areas throughout the Kilarc and Cow Creek developments will also be addressed by Soil Erosion and Sedimentation Control BMPs. Artificial swales, culverts, and/or other structures will be designed to direct runoff away from disturbed areas based on the natural drainage features of the area.

### **PM&E Measure GEOL-2: Implement Stormwater Pollution Prevention Best Management Practices**

PG&E will identify all potential pollutant sources, including sources of sediment (i.e., areas of soil exposed by grading activities and soil/sediment stockpiles) and hazardous pollutants (e.g., from petroleum products leaked by heavy equipment or stored in maintenance areas). Also, any non-storm water discharges, such as springs, will be identified. BMPs will be implemented to protect streams from these identified potential pollutants and to minimize erosion of top soil. A monitoring and maintenance schedule will be developed to address BMP affectivity for sediment control, spill containment, and post-construction measures.

PG&E will conduct a monitoring and reporting program including pre- and post-storm inspections, to determine if BMPs are sufficient to protect stormwater and to identify any areas where stormwater can be exposed to pollutants. Monitoring may include sampling and analysis to evaluate whether pollutants that cannot be visually observed are contributing to degradation of water quality. Post-construction monitoring will be conducted for one year.

### **PM&E Measure GEOL-3: Professional Engineering Design Plans and Specifications**

PG&E will consider the potential for landslides to occur during development of detailed design plans and specifications and will prepare plans to minimize this potential. Grading plans for new access roads or staging areas will be prepared to minimize cut and fill volumes, as well as to minimize any potential for landslides as a result of the grading work.

### **Hydrology and Water Resources**

No potential impacts are anticipated on hydrologic resources as a result of decommissioning activities. Therefore, no PM&E measures are proposed.



## **Geomorphology**

### **PM&E Measure GEOM-1: Sediment Release Measures**

Following removal of the South Cow Creek and Kilarc Main Diversion dams, PG&E will reshape the downstream face of the sediment wedge left in place to an appropriate angle of repose. In addition, PG&E will 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. This is to help advance the processes of natural channel formation at the knickpoint created by the dam removal, and transport excess material during subsequent periods of runoff, and to minimize the potential for fish passage problems. It is estimated that approximately 250 cubic yards (0.15 acre-feet) of sediment behind South Cow Creek Diversion Dam would need to be removed. This would leave approximately 1,150 cubic yards (0.70 acre-feet) stored behind the dam, all of which will be mobilized over time by natural sediment transport processes. Approximately 50 cubic yards (0.03 acre-feet) of sediment would need to be removed from behind Kilarc Main Canal Diversion Dam to connect the upstream and downstream channels. This would leave approximately 530 cubic yards (0.31 acre-feet) behind the diversion dam. Of the 530 cubic yards, about 250 cubic yards of predominantly gravel and cobble material will be entrained over time and transported through the diversion and dispersed to the downstream reach by natural fluvial processes. About 230 cubic yards (approximately 40% of the 530 cubic yards) is boulder sized material, most of which will likely remain in place.

The sediments remaining after excavation of the pilot channel would be allowed to redistribute downstream during natural high flow events. The cobble and gravel will distribute downstream with natural high flow events and will increase the amount of spawning habitat available for resident and anadromous salmonids.

Sediments excavated from the South Cow Creek and Kilarc Main Canal diversion impoundments will most likely be disposed locally at a suitable site (e.g. as canal fill). This assumes that on-site inspection during dam removal indicates that the excavated sediments are comprised of mostly gravel to cobble size material. The particle size composition obtained from bulk samples of the sediments stored behind the diversions (Appendix F and G) indicates that most material is within the gravel-cobble size range.

### **PM&E Measure GEOM-2: Bank Erosion Measures**

To minimize potential bank erosion, PG&E will conduct the following monitoring and mitigation:

- A monitoring assessment will be performed for after dam removal. A visual assessment with photographic documentation of the impounded sediment wedge and streambanks adjoining the perimeter of the former impoundment area will be conducted after spring runoff. The visual assessment will be used to identify any areas of active erosion or undercutting, or areas that appear to be susceptible to



erosion. Following two years of monitoring, PG&E will consult with the resource agencies on the need for any additional monitoring.

- If erosion or bank undercutting is observed over any streambank length greater than the 20 feet, then erosion control measures will be implemented and installed, as feasible, in the channel. Bank erosion control measures will be designed in consultation with the California Department of Fish and Game (CDFG), and the Central Valley Regional Water Quality Control Board (CVRWQCB). These erosion control measures may include planting vegetation on the exposed sediment 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. Any re-vegetation will be consistent with the MMP (see PM&E Measure BOT-1).

### **Water Quality**

PM&E Measures GEOL-1 and GEOL-2 will be implemented.

### **Aquatic Resources**

#### **PM&E Measure AQUA-1: Isolate Construction Area**

To minimize the deconstruction impacts at the five diversion dams and the Kilarc Tailrace where instream construction would be required, PG&E will isolate the construction area from the active stream using coffer dams or other such barriers. Water will be routed 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.

#### **PM&E Measure AQUA-2: Conduct Fish Rescue in Instream Work Areas**

After a work area is isolated, PG&E will conduct a fish rescue to remove any fish trapped in the work area. These fish will be relocated to an area of suitable habitat within Old Cow Creek or South Cow Creek downstream of the work area.

#### **PM&E Measure AQUA-3: Avoid Sensitive Periods for Steelhead and Chinook Salmon for the Removal of South Cow Creek Diversion Dam**

The decommissioning work at South Cow Creek Diversion Dam will be conducted from July through September when adult anadromous salmonids are not present in the stream.

#### **PM&E Measure AQUA-4: Meet NOAA Fisheries Passage Guidelines for Anadromous Salmonids**

In the event it is necessary that a portion of the South Cow Creek Diversion Dam be left in place as a grade control structure, the structure will be modified in such a fashion as to meet all NOAA Fisheries passage guidelines (drop, velocity, depth and other site specific



factors) for anadromous salmonids. PG&E will consult with NOAA Fisheries on designs to provide adequate fish passage.

**PM&E Measure AQUA-5: Consult with CDFG**

PG&E will request that CDFG stop releasing trout into the Kilarc Forebay the year before the facility is decommissioned. Additionally, PG&E will request that the Fish and Game Commission alter the catch limits for anglers to further reduce the number of fish remaining in the forebay when it is decommissioned.

**PM&E Measure AQUA-6: Conduct Fish Rescue in Canals and Forebays, as Needed**

PG&E will conduct fish rescues on the Kilarc Canal and Forebay to rescue any fish that remain in these waters during the decommissioning process. These fish will be relocated to suitable areas to be determined in consultation with CDFG. PG&E will consult with CDFG and NMFS with regard to the need to conduct fish rescues on South Cow Creek Main Canal and Cow Creek Forebay, as fish surveys in 2003 indicate that these waters are dominated by non-desirable golden shiner and sunfish and have a very low incidence of rainbow trout/steelhead or lamprey due to the fish screens at the South Cow Diversion. If a fish rescue is required for Cow Creek Canal or Forebay, this rescue will target salmonids and lamprey.

**PM&E Measure AQUA-7: Retain Fish Screen in South Cow Creek Main Canal**

PG&E will retain the fish screen until after the fish rescue in the South Cow Creek Main Canal is complete and fish can no longer enter the this canal. This will minimize potential impacts to steelhead and resident fish. The fish rescue will target rainbow trout/steelhead, lamprey, and other native fish. Non-native fish, such as golden shiner, will not be released. Once the fish rescue has been accomplished the head of the canal will be closed off before the screens are removed.

**PM&E Measure AQUA-8: Discontinue Cow Creek Powerhouse Operations in Spring**

PG&E will discontinue Cow Creek Powerhouse operations in the spring when natural flow is present upstream of the powerhouse, so that Hooten Gutch will become dewatered as the natural flows subside.

**Wildlife Resources**

**PM&E Measure WILD-1: Conduct Pre-Construction Surveys for Amphibians, Pond Turtles and Nesting Birds**

PG&E will conduct pre-construction surveys for amphibians and pond turtles prior to construction activities at the diversions, and any individuals will be captured and relocated to suitable habitat. Exclusion fencing will be installed around the construction



area. A biological monitor will be available throughout the construction phase to ensure the identification and relocation of any individuals wandering into the construction area.

PG&E will conduct pre-construction surveys for nesting birds if vegetation removal is scheduled during the breeding period (generally March 1 to September 1). If an active nest is found occupied by a special-status species or by other species protected by the Migratory Bird Treaty Act, the area will be avoided and construction activities will be restricted to an appropriate distance to avoid nest disturbance until nestlings have fledged.

### **PM&E Measure WILD-2: Conduct Pre-Construction Surveys for Raptors**

PG&E will conduct pre-construction surveys raptors at protocol or standard distances (0.5 mile for peregrine falcons, 0.75 mile for goshawk, 660 feet for bald eagle, and 300 feet for other raptors) from the deconstruction area (Call, 1978; Fuller and Mosher, 1987; Cade, et. al., 1996, PBRG 2007, USFWS 2007). Pre-construction surveys will be conducted no earlier than 14 days prior to start of construction during the protocol survey period for peregrine falcon (March 15 to August 15). For northern goshawk, dawn acoustical surveys will be conducted if the surveys must be done from February to April or intensive search surveys will be implemented for surveys from late June to fall. If goshawks are detected, a brief search of the detection area during the late incubation or nestling stage is required to determine the location of an active nest. For bald eagle, initial surveys will be conducted from late February through March (Jackman and Jenkins, 2004). If necessary, additional surveys will be conducted in mid-nesting season (late April through May) and late in the season (early June to early July). Surveys could be conducted on foot, or with terrestrial vehicles, or aircraft. If an active raptor nest is found within the survey area the nest would be avoided and deconstruction activities will be restricted to an appropriate distance to avoid nest disturbance until nestlings have fledged.

### **PM&E Measure WILD-3: Conduct Pre-Construction Surveys for Elderberry Shrubs and Bats**

PG&E will conduct protocol pre-construction elderberry surveys within 100 feet of any deconstruction activities that could affect vegetation. If an elderberry shrub with one or more stems greater than 1 inch in diameter could be directly or indirectly affected by the activities, the measures provided in the Biological Opinion covering PG&E's service area in the range of the valley elderberry longhorn beetle (VELB) (USFWS, 2003) will be implemented.

If deconstruction activities are initiated between March 1 and September 30, PG&E will conduct pre-construction surveys for bats at the tunnels and powerhouses. During the day, these facilities would be searched for bats or bat signs such as guano, staining, and culled insect parts. Internal surveys will consist of surveying the interiors of tunnels and powerhouses. External surveys will consist of surveying the external features of structures that could be used for roosting. Nighttime surveys in or near the facilities will



consist of counting bats as they exit to forage in the evening, assessing use of facilities to roost in at night, and acoustic monitoring with ultrasonic equipment in conjunction with computer software and visual observation. Limited capture of bats using nets could be conducted to facilitate species identification (captures will be conducted by a qualified bat biologist). If deconstruction activities occur between October 1 and February 28 (non-breeding season) no pre-construction surveys for bats will be required unless existing facilities with known (previously documented through monitoring surveys or historic observations) or potential hibernation roost sites will be disturbed.

#### **PM&E Measure WILD-4: Exclude Wildlife from Tunnels**

PG&E will seal off Project tunnels at both ends in order to exclude wildlife (i.e., bats) from entry or habitation. Pre-construction surveys will verify that tunnels are uninhabited prior to any work. If bats are present, one-way exclusion devices will be installed prior to the breeding season before construction begins, in order to allow bats to leave the tunnels, but not return. Excluders will be placed at all active entry points and will remain in place for at least 5 to 7 days. These devices will be removed after the bats are excluded, and then exclusion points will be sealed (BCI, 2008).

#### **Botanical Resources**

##### **PM&E Measure BOTA-1: Prepare and Implement a Mitigation and Monitoring Plan (MMP)**

PG&E will prepare and implement a Mitigation and Monitoring Plan (MMP) for impacts to riparian and wetland vegetation. The MMP will be developed in consultation with the United States Army Corps of Engineers (USACE), the CDFG, and the SWRCB. This MMP will include mitigation areas (e.g., South Cow Creek Diversion Dam, Kilarc and Cow Creek forebays), goals, the species to be used, as well as methods and performance criteria. Riparian and wetland vegetation requiring restoration or mitigation will be monitored for 5 years following decommissioning.

Restoration of abandoned or temporary roadbeds will be part of this MMP, which will address compaction issues, seeding, mulching, and planting, developed in consultation with the landowners. Other disturbed areas, including temporary work areas, filled and graded areas, and roads requiring rehabilitation will be re-seeded.

##### **PM&E Measure BOTA-2: Conduct Pre-Construction Surveys**

PG&E will conduct pre-construction surveys for special-status plants in all areas that will be disturbed by decommissioning activities.

##### **PM&E Measure BOTA-3: Avoid Special-Status Plants to the Extent Possible and Restore Habitat Conditions**

PG&E will avoid any populations of special-status plants to the extent practicable. If decommissioning activities will result in temporary disturbance to part of a population, the



top 10 inches of soil from the disturbed area will be stockpiled, protected from exposure to weed seeds, and replaced when the decommissioning activities are completed.

## **Historical Resources**

### **PM&E Measure HIST-1: Documentation**

PG&E will prepare a Cultural Resources Section 106 Technical Report to document the architectural and historical significance of the two powerhouses and their condition prior to commencing decommissioning activities. In addition, PG&E will develop a Historic Properties Management Plan (HPMP) to address the long-term management and treatment of historically significant archaeological and historical resources within the Project APE. PG&E will also prepare photographic and architectural documentation that meets Historic American Building Survey and Historic American Engineering Record standards prior to commencing decommissioning activities.

### **PM&E Measure HIST-2: Securing Buildings**

PG&E will secure the two powerhouse structures from unwanted entry, provide adequate ventilation to the interiors, shut down or modify the existing utilities and mechanical systems, and develop and implement a maintenance and monitoring plan for the buildings. PG&E will implement these measures prior to decommissioning activities.

## **Archaeological Resources**

### **PM&E Measure ARCH-1: Archaeological Resources Summary**

PG&E will avoid all ground disturbing activities in the five eligible locations and an archaeological monitor will be present if Project activities occur within 50 feet of these identified resources. The decommissioning activities as proposed do not appear to pose potential impacts to these resources except in the case of the two newly identified lithic scatters along proposed access roads or at the locations of the other archaeological resources identified during this investigation. If PG&E cannot avoid ground disturbing activities at or near Sites 482-12-04, -03H, -05/H, -08/H, and -11/H, PG&E will obtain a formal evaluation for the sites' eligibility for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR).

### **PM&E Measure ARCH-2: Unanticipated Archaeological Sites**

If archaeological materials are accidentally disturbed during decommissioning activities, PG&E construction crews will stop all work within the immediate vicinity until a qualified archaeologist can evaluate the discovery and provide recommendations, if an archaeological monitor is not already present.



### **PM&E Measure ARCH-3: Encountering Human Remains**

If human remains are encountered as a result of decommissioning activities, PG&E will stop all work in the vicinity and contact the County Coroner immediately. In addition, a qualified archaeologist will be contacted immediately to evaluate the discovery, if a monitor is not already present. If the human remains are Native American in origin, then the Coroner must notify the Native American Heritage Commission (NAHC) within 24 hours of this identification.

### **Recreation**

#### **PM&E Measure REC-1: Solicitation of Interest to Recreational Operators**

PG&E will issue a Solicitation of Interest to all Interested Parties to determine if there would be entities potentially interested in operating the Kilarc Forebay and/or Kilarc Powerhouse and adjacent land for a recreational or historical public use. To assist interested organizations, PG&E will develop a guidance document that describes the requirements, obligations, issues, and opportunities associated with the undertaking.

To meet the desired conditions for the Kilarc Powerhouse structure and Kilarc Forebay, on March 10, 2008 PG&E issued solicitations of interest to all Interested Parties and developed a guidance document to assist any organizations potentially interested in owning, managing and operating the facilities.

#### **PM&E Measure REC-2: Advertise Recreational Resources on Website**

PG&E will post to its Kilarc Project website a list with a corresponding map of all alternative regional recreational facilities. The list will provide details such as site amenities, possible fees and any other pertinent information for visitors, as they are available. This information will be posted for no less than two years on the website.

### **Aesthetics**

As described in Section 3.11.1, decommissioning activities would not have an aesthetic impact on the Kilarc and Cow Creek Powerhouse building structures. However, with implementation of PM&E Measure HIST-2, these structures will be secured and access to the interior of the building will be restricted.

### **Land Use**

#### **PM&E Measure FIRE-1: Spark Arrestors**

PG&E will equip earthmoving and portable equipment with internal combustion engines with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).



### **PM&E Measure FIRE-2: Fire Suppression Equipment**

PG&E will maintain appropriate fire suppression equipment during the highest fire danger period – from April 1 to December 1 (PRC Section 4428).

### **PM&E Measure FIRE-3: Flammable Materials**

On days when a burning permit is required, PG&E will remove flammable materials to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and PG&E will maintain the appropriate fire suppression equipment (PRC Section 4427).

### **PM&E Measure FIRE-4: Portable Gas-Powered Tools**

On days when a burning permit is required, PG&E will not use portable tools powered by gasoline fueled internal combustion engines within 25 feet of any flammable materials (PRC Section 4431).

### **ES.3.8.5 Literature Cited (Section E.5)**

This section contains references cited in Exhibit E.

### **ES.3.9 Exhibit F**

This section is not pertinent to the DLSA and is not included.

### **ES.3.10 Exhibit G – Project Maps**

Exhibit G provides Project maps that show the location of all Project facilities and features, the FERC Project boundary, and federal and non-federal lands within the Project boundary.