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Application

For

An Original License

Exhibit E
Environmental Report

(Revised July 2016)

Pine Creek Mine
Tunnel Hydroelectric Project

FERC Project No. 12532

Prepared by:

Pine Creek Mine, LLC

In association with:

Water and Energy Consulting
HCI Hydrologic Consultants, Inc.
Sierra Geotechnical Services, Inc.
Glenn Lukos Associates, Inc.
ECORP Consulting, Inc.
Davis-King & Associates
JRP Historical Consulting
Matthew P. Gass, P.E

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GLOSSARY - DEFINITION OF TERMS, ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
Adit	Horizontal entrance to an underground mine
AF to	Acre-foot, the amount of water needed to cover one acre a depth of one foot
APE	Area of Potential Effect
BIA	Bureau of Indian Affairs, an agency of the DOI
BLM	Bureau of Land Management, an agency of the DOI
BMI	Benthic macroinvertebrate bioassessment
CADD	Computer aided drafting and design
CDFG/CDFW	California Department of Fish and Game/Wildlife
CDWR	California Department of Water Resources
CFR	Code of Federal Regulations
cfs	Cubic feet per second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationship
DKA	Davis-King & Associates
DLA	Draft License Application
DO	Dissolved Oxygen
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
EA	Environmental Assessment
EAP	Emergency Action Plan
ECORP	ECORP Consulting, Inc.
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement

Abbreviation	Definition
EIS	Environmental Impact Statement
EL	Elevation
EPA	Environmental Protection Agency
ESA	Federal Endangered Species Act
EQSEARCH	Seismic peak acceleration computer estimation program
FEA	Final Environmental Assessment
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FRISKSP	Probabilistic computer seismic hazard analysis
FWCA	Fish and Wildlife Coordination Act
GIS	Geographic Information Systems
GLA	Glenn Lukos Associates, Inc.
GWh	Gigawatt-hour (equals one million kilowatt-hours)
HCI	Hydrologic Consultants, Inc.
Hp	Horsepower
ILP	Integrated License Process
Installed Capacity	Nameplate MW rating of a generator or group of generators
JRP	JRP Historical Consulting
kW	Kilowatt
kWh	Kilowatt-hour
kV	Kilovolts
LADWP	Los Angeles Department of Water and Power
O&M	Operations and Maintenance
PAD	Pre-Application Document
PDF	Portable Document Format
PLP	Preliminary License Proposal
PM&E	Protection, Mitigation and Enhancement Measures

Abbreviation	Definition
PMF	Probable Maximum Flood
Project Area	The area extrapolated to the land surface directly above the underground portions of the FERC Project boundary and the above-ground portions of the Project boundary.
Project Boundary	The boundary line defined in the Project license issued by FERC that surrounds those areas needed for operation of the Project, primarily the underground mine tunnel/adit rights of way.
Project Vicinity	The general geographic area in which the Project is located
PSP	Proposed Study Plan
Project Study Area	The geographic area in which a specific resource is potentially affected by the project.
PCL	Practical Quantification Limit
RBP	Rapid Bioassessment Protocol
RM	River mile
RMP	Road Maintenance Plan
RSP	Revised Study Plan
SD	Scoping Document
Service List	A list maintained by FERC of parties who have formally intervened in a proceeding. In licensing, there is no Service List until the license application is filed and accepted by FERC. Once FERC establishes a Service List, any documents filed with FERC must also be sent to those entities on the Service List.
SGSI	Sierra Geotechnical Services, Inc.
SHPO	State Historic Preservation Officer
SNBS	Sierra Nevada bighorn sheet

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Abbreviation	Definition
Species	Rare, threatened, endangered and special status species, which for purposes of this FLA is defined to include (1) all species (plant and animal) listed, proposed for listing, or candidates for listing under the Federal and state Endangered Species Acts and those listed by the USFWS as sensitive, special status or watch list
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
USAGE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	Environmental Protection Agency
USFS	U.S. Forest Service, an agency of the USDA
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQC	Water Quality Certification, issued under Section 401 of the Federal Clean Water Act
WQPP	Water Quality Protection Plan

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1.0 INTRODUCTION

1.1 Application

Pine Creek Mine, LLC (Applicant) owns the proposed Pine Creek Mine Tunnel Hydroelectric Project (Project), identified by the Federal Energy Regulatory Commission (FERC) as Project No. 12532. Applicant files this Final License Application (FLA) for a new license. This revised application supersedes that filed February 12, 2016. The FLA includes this Environmental Report in accordance with FERC regulations regarding application content under the Integrated License Process (ILP) (18 CFR § 5.18). This Exhibit E, Environmental Report, is presented as an Applicant-Prepared Environmental Assessment (APEA) per the form and content requirements of 18 CFR § 5.18(b). In particular, the APEA has been prepared to address the possible relevant environmental effects of Project operations as developed during the license process and FERC's Scoping Document (SD). Prominent issues identified in the SD included:

Aquatic Resources

- Potential effects of Project construction, operation, and maintenance on water quality, including dissolved oxygen, turbidity, and temperature in Pine Creek.
- Potential effects of Project construction, operation, and maintenance on water flow into Pine Creek.
- Potential effects of Project construction, operation, and maintenance on the potential for flooding in Pine Creek.
- Potential effects of Project construction and operations on fishery resources in Pine Creek.

Terrestrial Resources

- Potential effects of Project construction, operation, and maintenance on vegetation and wildlife resources that may occur within the Project Area

Threatened and Endangered Species

- Potential effects of Project construction, operation, and maintenance on threatened or endangered species.

Recreational Resources and Land Use

- Potential effects of Project construction, operation, and maintenance on existing recreation resources within the project area.

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- Potential effects of Project construction, operation, and maintenance on adjacent land uses.

Cultural Resources

- Potential effects of Project construction, operation, and maintenance on cultural resources, including archaeological and architectural sites that are potentially eligible for the National Register of Historic Places.

Geology and Soils Resources

- Potential effects of Project construction, operation, and maintenance on geology and soils within the Project Area.

Developmental Resources

- Effects of any proposed or recommended protection, mitigation and enhancement measures on Project economics.

The Project is located at Pine Creek Mine north of Bishop, California in Northern Inyo County at the top of Pine Creek Canyon, above the confluence of Morgan and Pine Creeks, two of many tributaries in the Owens River Basin. When licensed and completed, the Project will be the second of two hydroelectric facilities at the mine. The other facility currently operates downhill from the Project on mine property, uses the same water resources that the Project will, and is exempt from FERC licensing. The Project lies within the FERC Project Boundary.

Applicant is the proposed licensee, operator, and current owner of the Project. Applicant proposes to operate the Project for the next 50 years. Applicant does not propose to change the Pine Creek Mine Tunnel Hydroelectric Project in the future.

The underground portion of the Pine Creek Mine, within which the Project is located, comprises over 100 miles of underground workings developed primarily for tungsten mining. The Project will utilize the head created underground by an engineered concrete plug in the Easy-Go Tunnel that is presently in place. Naturally accumulating spring water within the mine's tunnel-shaft-vault system will generate a total sustainable discharge averaging approximately 10 cfs. This will result in significant head pressure that will create a viable hydroelectric energy resource from water completely within the mine network in which water will exit the Project in run of the mine fashion. No appreciable negative impact on the environment is foreseen.

The mine's subterranean network creates the opportunity to utilize the reinforced concrete plug and existing water discharge piping facilities to control flow and head potential through the mine network to create hydroelectric power. The plug will store water underground with up to 1,320 feet of gross head above the plug elevation. It is situated some 8,080 ft. above sea level, is approximately 12 feet wide by 12 feet high by 30 feet thick and is located inside the mine roughly 2,500 feet from daylight at the Easy-Go Portal.

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Percolating spring water originating inside the mine is not currently stored inside the mine. It flows unimpeded through openings on the plug into an existing gravity fed hard-rock ditch that runs to the mine portal and thence to Morgan Creek after making power downhill at the presently existing hydroelectric facility. Morgan Creek feeds into Pine Creek below the mine property.

The Project would use the mine's existing private substation connections to generate that power needed to resume tungsten mining operations and would distribute excess capacity to a local utility or the wholesale grid. A license is sought to sell excess capacity power. The existing substations are sized several times greater than the expected output of the Project.

The Project's Area of Potential Effects (APE), as determined for the purposes of consultation under the National Historic Preservation Act (NHPA), Section 106, consists of all lands, Project facilities and features within the FERC Project Boundary. See Figure 2.4 for a Project Boundary Map.

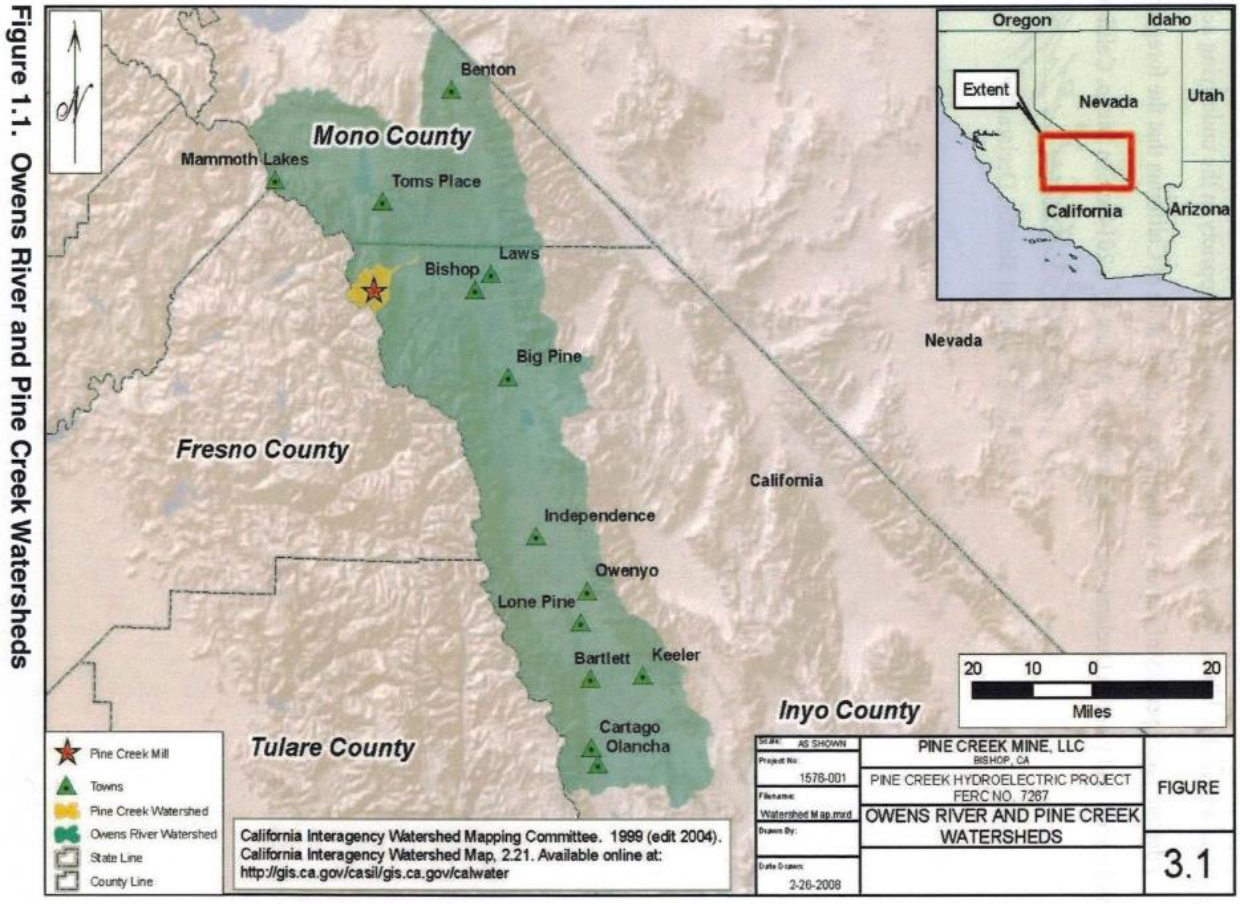

Figure 1.1 Owens River and Pine Creek Watersheds

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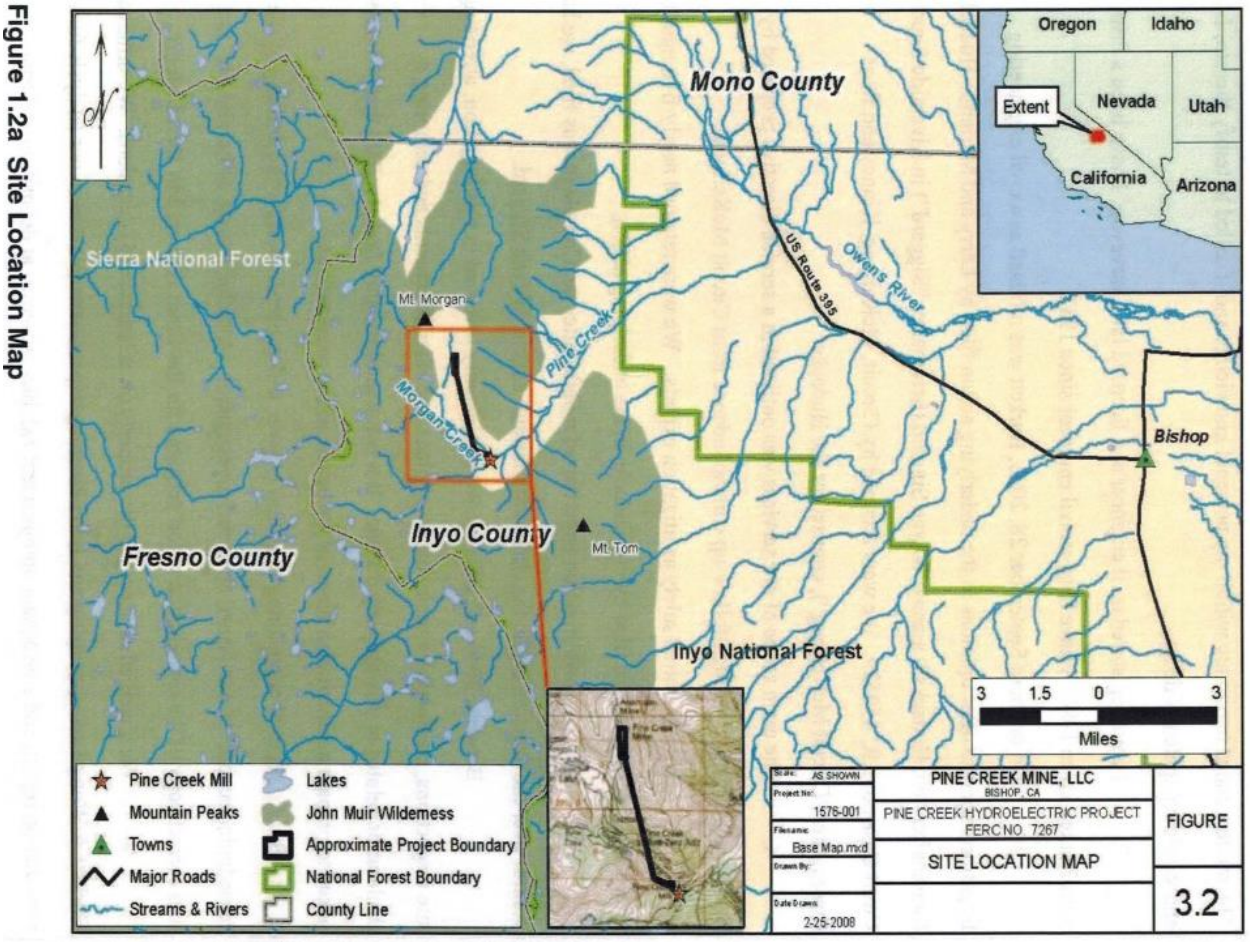

Figure 1.2a Site Location Map

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Pine Creek Mine, LLC
Tunnel Hydroelectric Project
FERC Project No. 12532

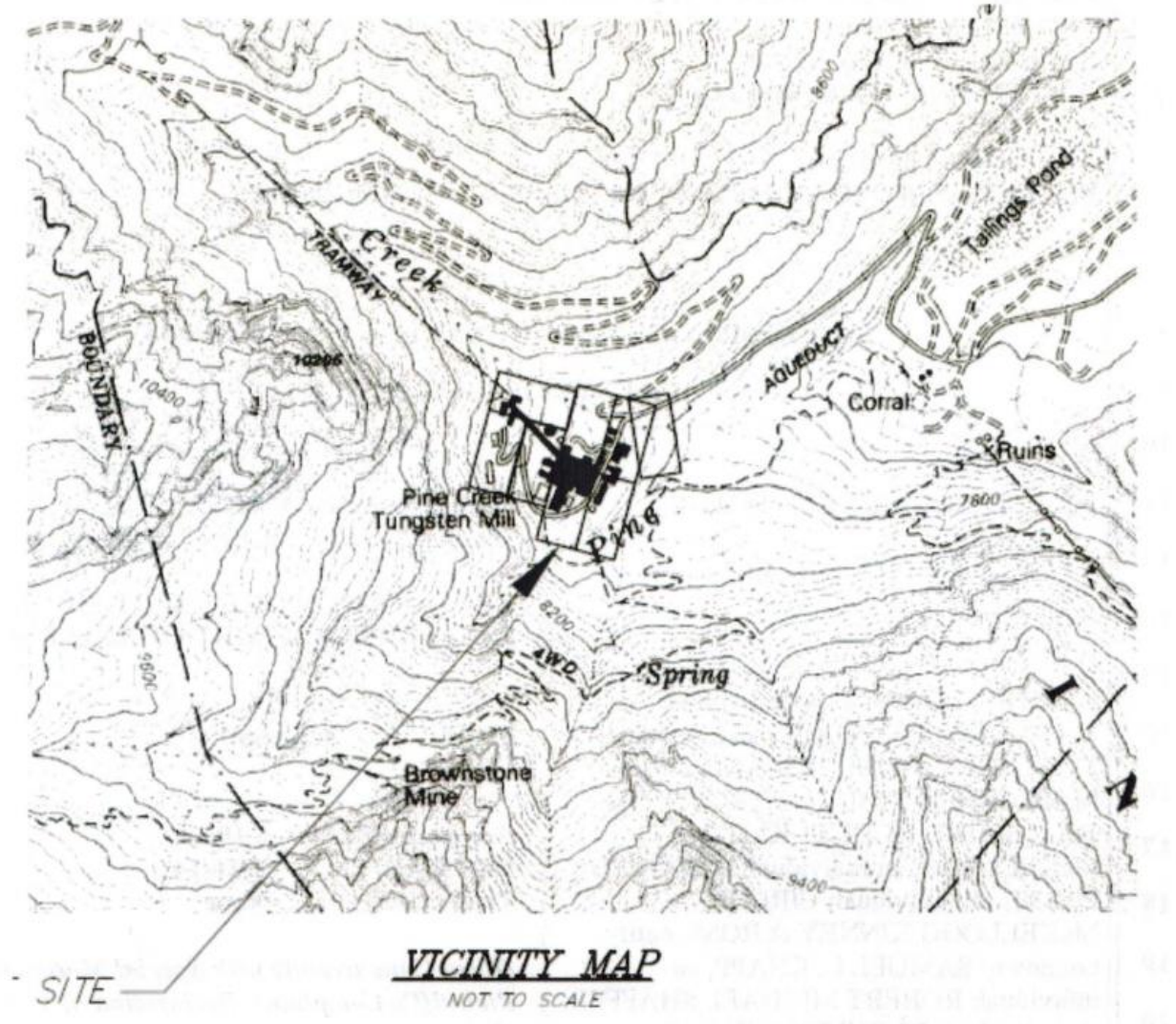

Figure 1.2b — A portion of Exhibit G-1 Project Area Vicinity Map (Detail)

1.2 Purpose of Action

FERC must determine whether to issue a new license to Applicant that would allow it to generate low-cost renewable electrical power within the recesses of the mine. In determining whether to issue a license, the Commission must consider the power and developmental purposes of the Project in relation to the aims of (1) energy conservation, (2) the potential need to protect and if possible enhance the habitat for fish and wildlife, (3) mitigation of any possible damage to fish and wildlife, (4) the

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protection of recreational opportunities, and (5) the preservation of other potential aspects of environmental quality. All environmental studies undertaken in connection with the Project indicate that licensing the Project would expand California's renewable resources without any negative impact on the environment.

This APEA assesses the effects associated with operation of the Project and recommends environmental measures that would become part of the new license. In this document Applicant assesses the environmental and economic effects of constructing and operating the Project. In doing so, Applicant provides information and analyses for resources identified by FERC in the SD as potentially affected by the Project.

1.3 Need for Power

Pine Creek Mine. LLC has been commercially idle for some twenty years. Market conditions were such that China in particular was able to produce tungsten more cheaply than the United States. But with the exhaustion of some of the world's largest active tungsten mines, such as that located in Canton, China, the market has strengthened to the point where producing domestic tungsten is again economically viable. Domestic tungsten is a national strategic resource. Power generated by the Project will be used to operate the mine. It is anticipated that the Project will generate enough electricity to support mining operations at full capacity. Excess capacity will be sold interstate and it is for that power that this license is sought.

The Project is located within the Western Electricity Coordinating Council region of the North American Electric Reliability Corporation (NERC). NERC's 2012 Long-Term Reliability Assessment documents a substantial need for power in the region: the total demand for the summer season is projected to increase by 1.7 percent per year for the 2013-2022 time periods. Internal demand forecasts vary from 5,137 megawatts (MW) in 2014 to 5,583 MW in 2022 (NERC 2012).

Additionally, according to the 2011 Integrated Energy Policy Report, California's energy demands have recently declined due to the state's economic downturn but demand are expected to increase over time as the economy improves. The California Energy Demand 2012-2022 Final Forecast' was developed by the California Energy Commission as part of its 2011 Integrated Energy Policy Report. The 2012 California Energy Demand 2012-2022 Final Forecast estimates electricity consumption will reach an annual average growth rate of between 1.18 percent and 1.68 percent by 2022.[1]

Finally, in 2013 California Governor Jerry Brown established the goal that California's Renewable Portfolio Standard (RPS) achieve 33 percent of the state's total energy consumption by 2020.

[1] California Energy Demand 2012-2022 Final Forecast. Adopted by the California Energy Commission June 2012. (CEC-100- 2012-001CMF)

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The Project will serve as part of the infrastructure to ensure that increasing demand for renewable power in California is met.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 No-Action Alternative

The no-action alternative would prevent Project operations under the terms of the proposed license, in effect reducing the amount of green renewable power available in California.

2.1.1 Project Facilities

Pine Creek Mine has operated for over nine decades. Although it is now commercially idle as a mine, a mining company has begun to bring the mine back on line. its existing shaft-tunnel-vault system creates the opportunity to adapt the engineered concrete plug inside the Easy-Go Tunnel to existing discharge piping facilities to control flow and head potential from spring water accumulating in the mine network to create hydroelectric power. Existing facilities include a private electrical substation, project distribution line and a SCE substation as described on Exhibit G-1 and G-3.

Figure 2.1 shows a plan view of the existing tunnel course and the proximity of the tunnel plug to the mine portal.

Figure 2.2 shows a cross section view of the existing mine network to be used for the Project, and the proximity of the tunnel plug and hydro generator to the Easy-Go portal. The proposed penstock for the installation would use an existing 18-inch steel pipe through the existing steel-reinforced concrete plug.

See Figure 2.1 On Next Page

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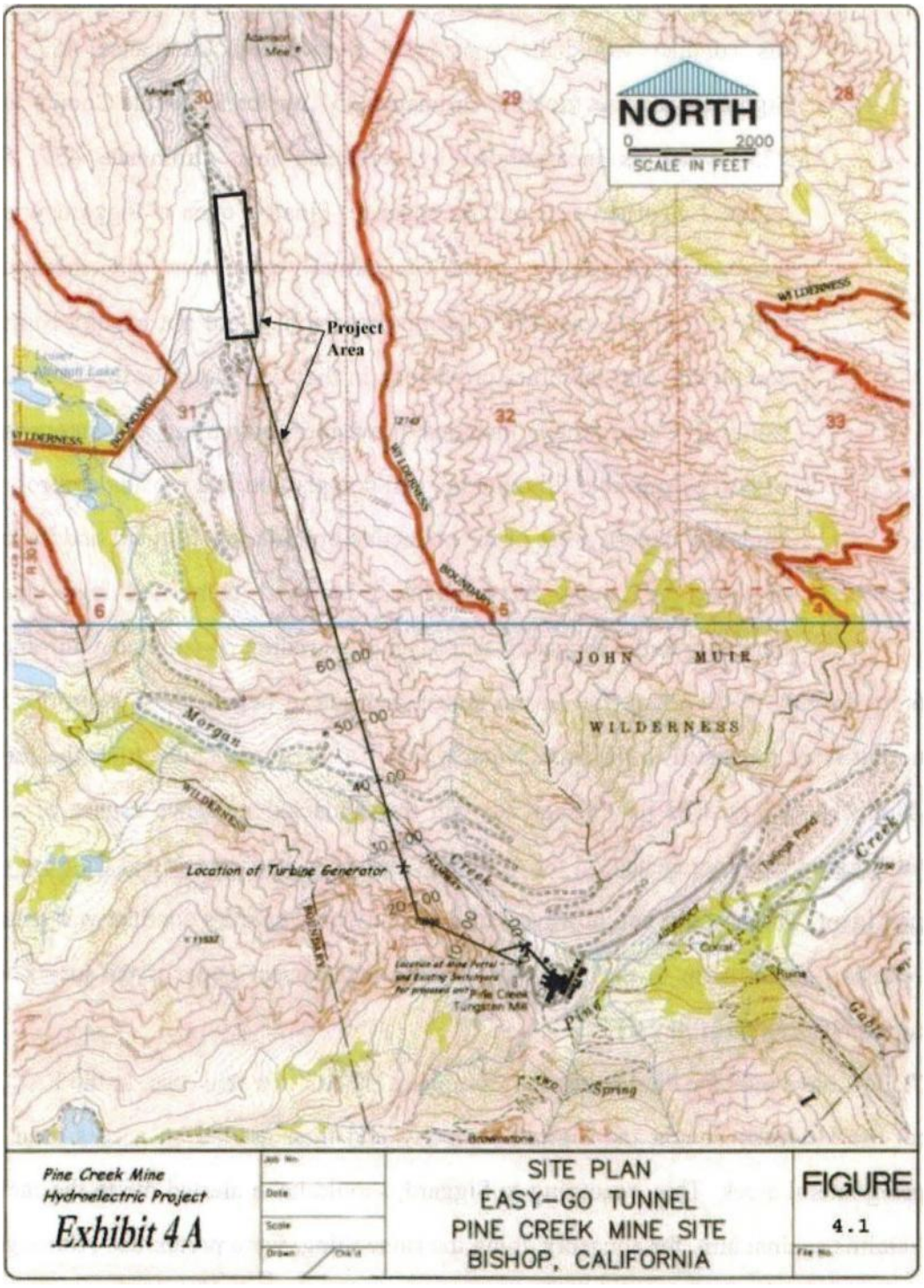

Figure 2.1 Site Plan: Easy-Go Tunnel, Pine Creek Mine Site

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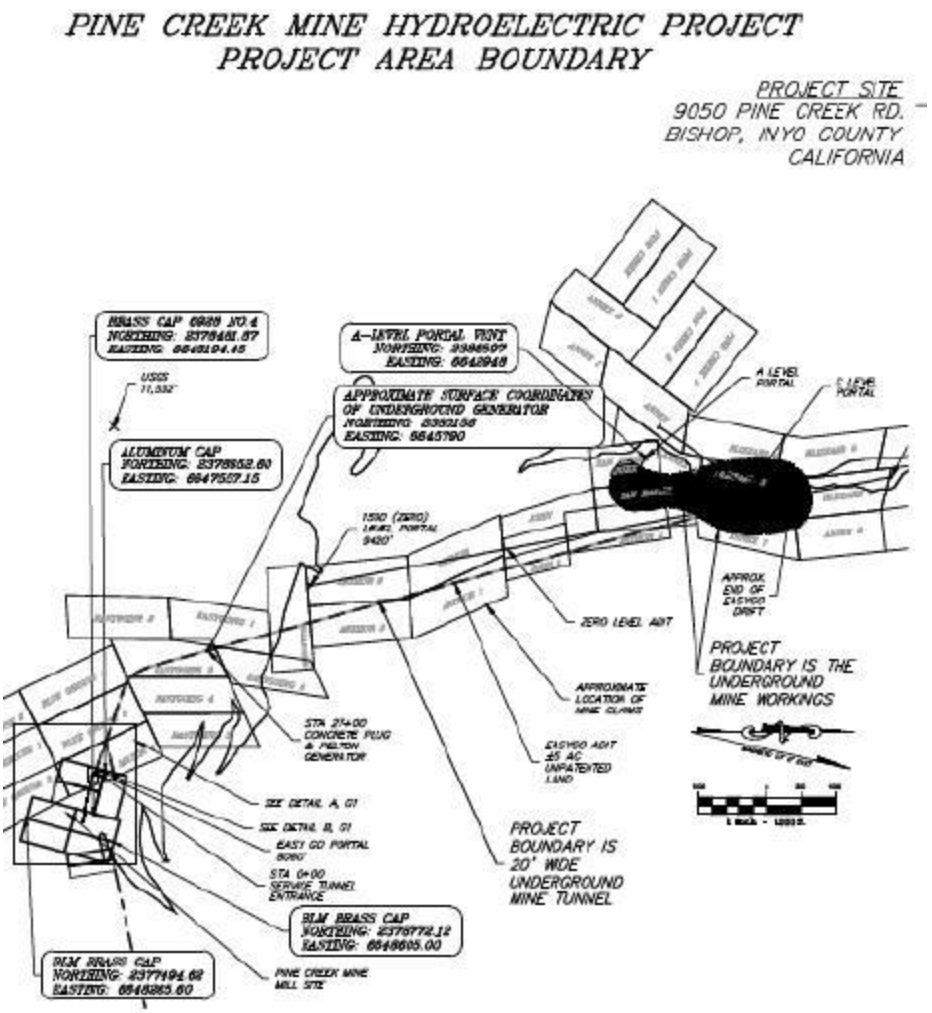

Figure 2.2a - A portion of Exhibit G-1 showing the Project Boundary Map including the mill site and the property over the Easy Go Adit, the turbine and the flooded mine

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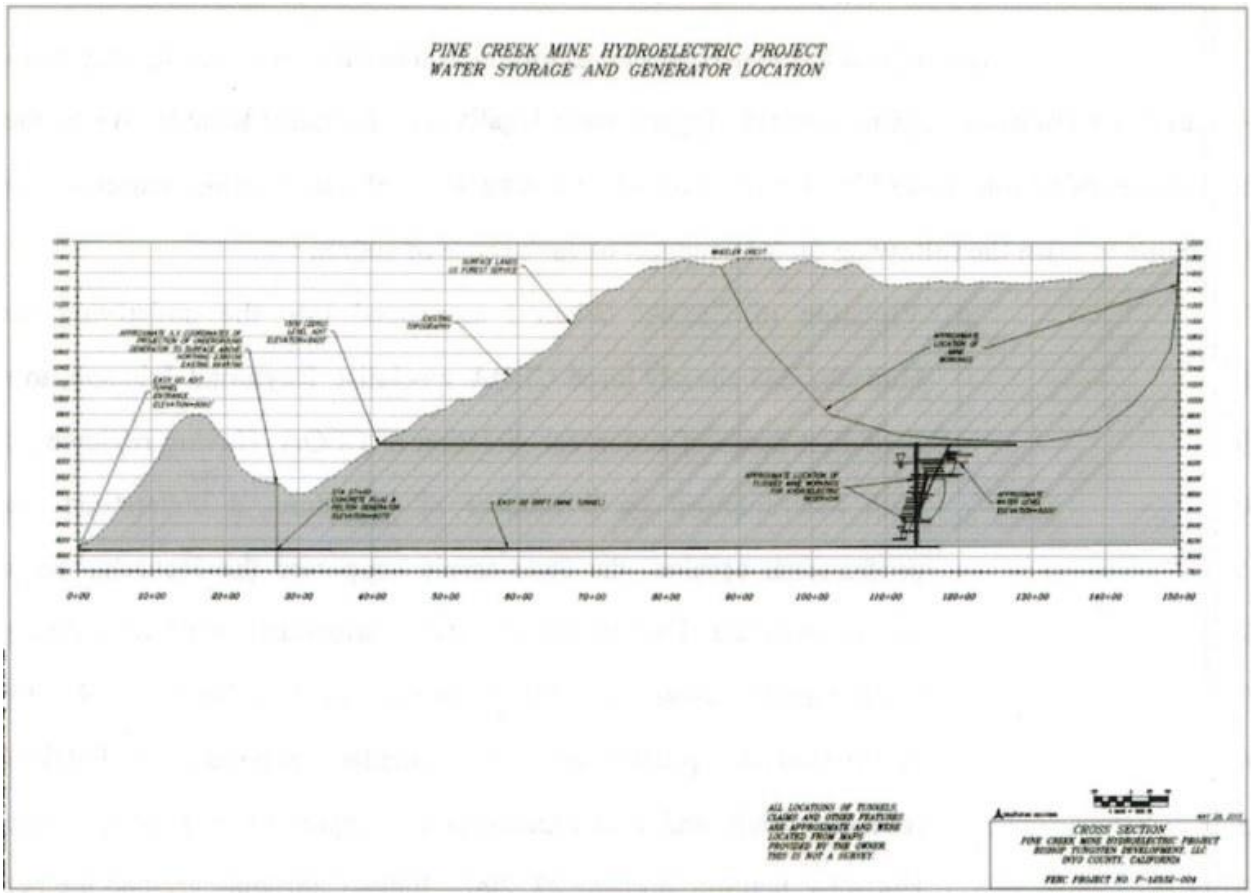

Figure 2.2b shows a cross section view of the existing tunnel course and the location of the tunnel plug and proposed hydro generator inside the mountain. It also depicts the approximate area of water impoundment for the Project

There would be no consumptive use of water by the Project.

New Facilities

Figure 2.3 shows the existing mine plug, proposed Project penstock and proposed turbine unit. As indicated in Figures 2-2 and 2-3, the new generating facility will be located entirely underground in the existing mine tunnel connected to the existing engineered concrete plug by an 18" steel penstock approximately 30 feet long. Discharge will flow at run of the mine levels into an existing gravity-fed hard-rock ditch where it will flow out of the mine as it has for decades. The proposed site will have a total installed capacity of 1.5 mW with a design maximum head of 1,320 feet and a maximum discharge capacity of 14 cubic feet per second (cfs). The proposed site will store up to approximately 200 acre-feet of ground water within the mine and have a maximum underground water surface elevation of 9,400 feet above sea level.

The Project's hydroelectric generator will be a Pelton hydropower turbine. Peltons are impulse turbines suitable for high head, low flow applications. They discharge to

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atmospheric pressure. A Pelton turbine has one or more free jets that direct water streams to each bucket on the runner. The runner must be located above the maximum tailwater to permit operation at atmospheric pressure. The water flows out the bottom of the turbine housing by gravity after hitting the runner. Thus, the only change in water flow following power generation will be a reduction in water velocity consistent with water flow occurring within the granite ditch.

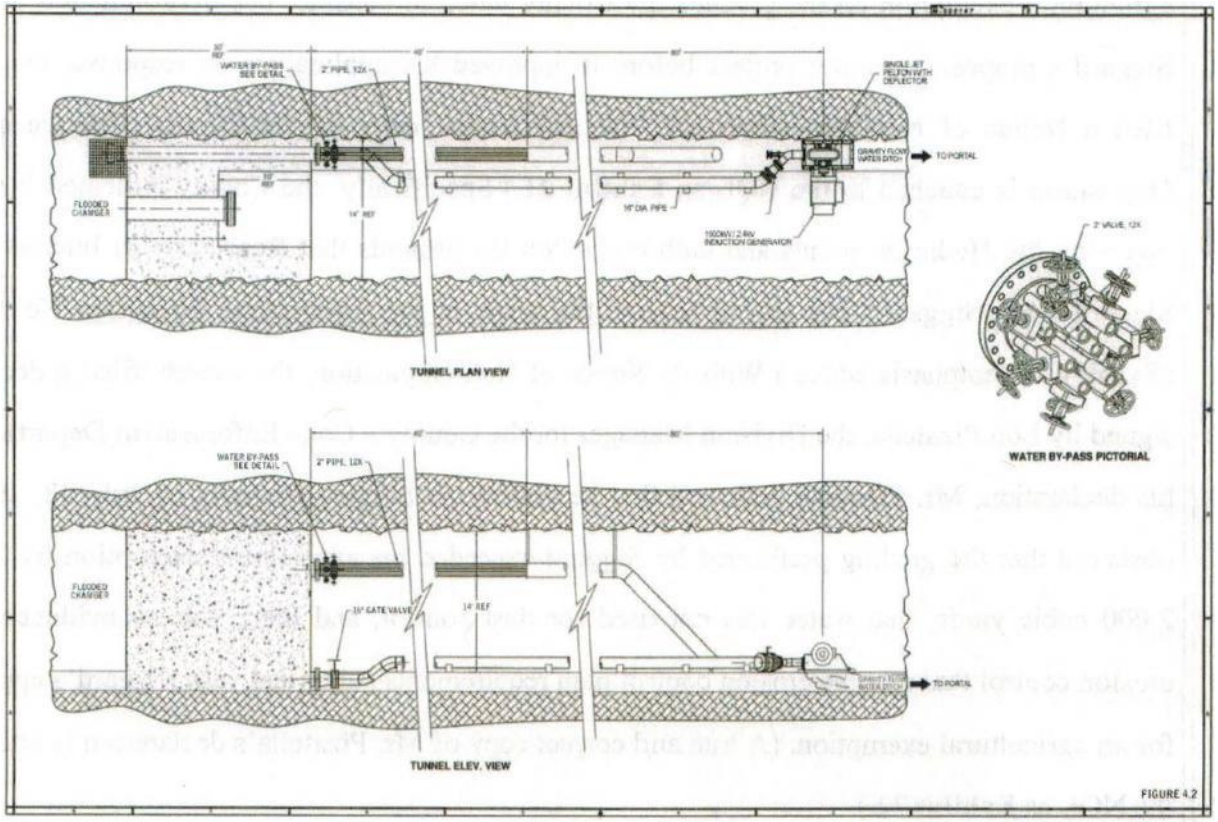

Figure 2.3 Existing Mine Plug and Proposed Project Penstock and Turbine Unit, Pine Creek Mine Site

Discharge from the new generating facility at the Easy-Go Portal will terminate into the existing mine water discharge system for the Exempted Conduit facility (FERC No. P-13163), which consists of dual-run steel and HDPE pipes of various sizes (12" to 18") and each approximately 1000 feet in length conveying water through the former millsite and discharging it through existing rip rap into Morgan Creek, an ephemeral tributary of Pine Creek.

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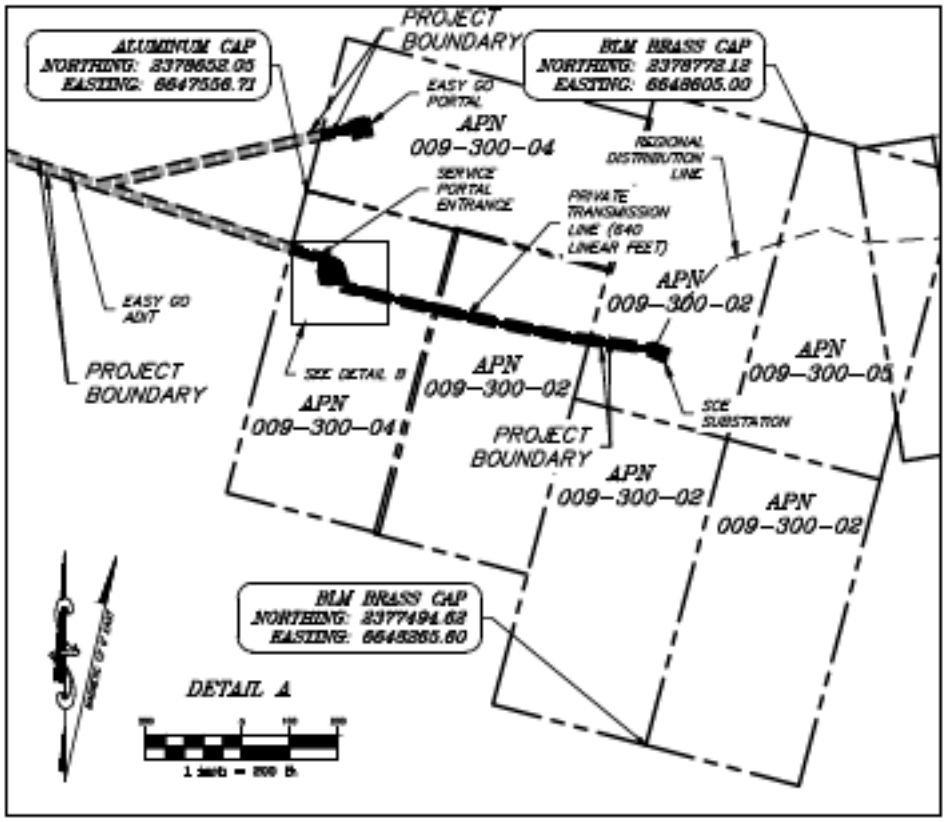

Figure 2.4. A portion of Exhibit G-1 Project Area Boundary Map (Detail A). Shows the Easy Go Portal and Service Portal Project Boundary.

2.1.2 Project Operations

2.1.2.1 Routine Maintenance Activities

Routine maintenance at the Project site will be performed regularly by full time mine personnel who will inspect and service the Project, including all sections of the existing Mine Water Discharge System. Occasional snow removal on roads leading to the Easy-Go Portal is contemplated during winter months as needed.

2.1.2.2 Facility Inspections and Repair

For purposes of the Project, on a regularly basis maintenance staff will conduct inspections beginning at the SCE substation and continuing uphill to the Easy-Go Portal, and from there inside the mine to the plug, penstock and turbine, inspecting all cables, equipment and conduit piping. No environmental disturbance associated with routine Project inspections and maintenance is anticipated.

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2.1.2.3 Vegetation Management

Because the Project is underground where there is no vegetation, and because the conduit and cabling that daylights at the millsite are already in place due in part to the smaller hydroelectric facility already in operation, the Project is not expected to affect vegetation either on mine property or on surrounding lands.

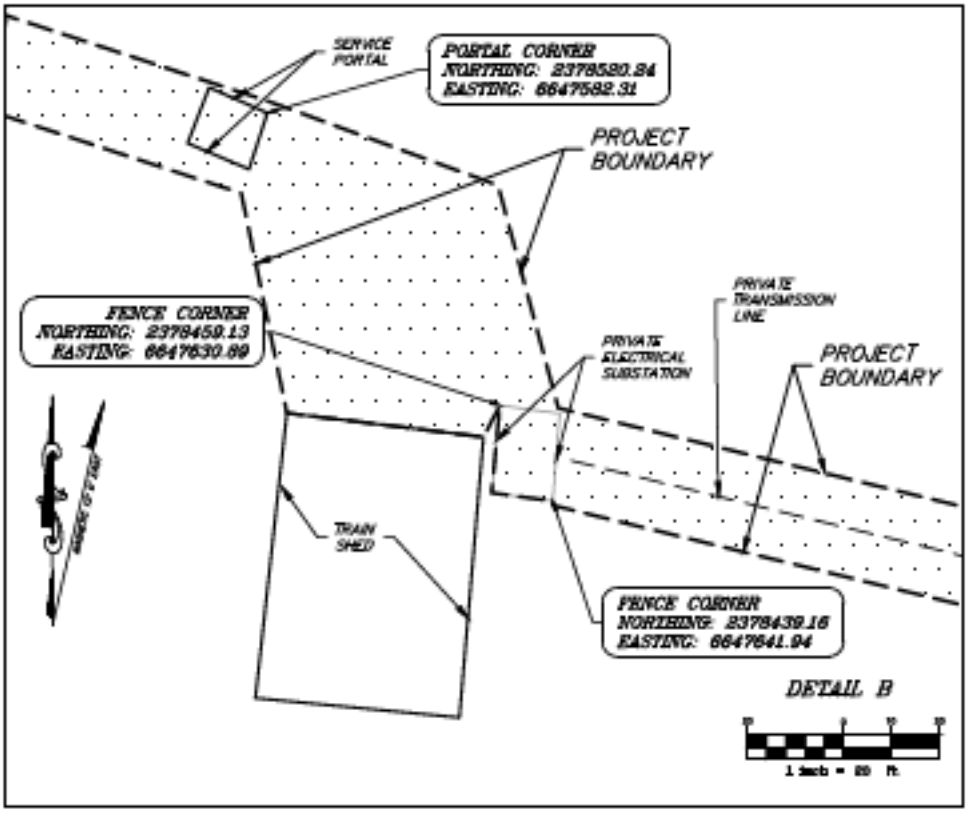

Figure 2.5 — A portion of Exhibit G-1 Project Area Boundary Map (Detail B. Details of the Service Portal & Substation Project Boundary.

2.1.3 Proposed License Articles and Environmental Measures

Those standard License articles applicable to the Project are enumerated below:

Article 1. The Project works and Project area included in the Commission's order shall be subject to all the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications and statements described and designated as exhibits and approved by the Commission in its order as part of the license until such change shall have been approved by the Commission; provided, however, that if the Licensee or the

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Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval such revised or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become part of the license and shall superseded, in whole or in part, such exhibit or exhibits previously made a part of the license as may be specified by the Commission.

Article 3. The Project area and the Project works shall be in conformity with the approved exhibits. If the Licensee shall contemplate any alterations in or additions to the Project area or Project works, the Licensee shall submit to the Commission for approval amended, supplemental or additional exhibits as provided in Article 2 hereof to show and describe such alterations or additions, together with a statement in writing setting forth the reasons which necessitate or justify such alterations or additions. Except when emergency shall require it for the protection of life, health, or property, no alteration or addition not in conformity with the approved exhibits shall be made to any Project works under the license without the prior approval of the Commission; and any emergency alteration or addition so made shall thereafter be subject to such modification and change as the Commission may direct.

Article 4. The Project, including construction, operation and maintenance and any work incident to additions or alterations shall be subject to the inspection and supervision of such officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purpose. The Licensee shall furnish to said representative as he may require concerning the construction, operation and maintenance of the Project, and of any alteration thereof, and shall notify him of the date upon which work with respect to any construction or alteration will begin, and as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through and across the Project lands and Project works in the performance of their official duties.

Article 5. The Licensee shall be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands or to other property of the United States occasioned by the construction, operation and maintenance of the Project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, shall be made with the appropriate department or agency of the United States.

Article 6. If the Licensee shall cause or suffer essential Project property to be removed or destroyed or to become unfit for use, without replacement, or shall abandon or discontinue good faith operation of the Project for a period of three years, or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission

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will deem it to be the intent of the Licensee to surrender the license, and not less than 30 days after public notice may in its discretion terminate the license.

Article 7. Licensee shall pay to the United States the following annual charge effective the first day of the month in which the license is issued for the purpose of reimbursing the United States for the costs of administration of Part I of the Act $5.00 per annum.

Article 8. Licensee shall complete construction of the Project within one year of the date of issuance of the license.

2.2 Applicant's Proposal

Applicant proposes that Project operations will exclusively utilize accumulated spring water within the mine to generate hydroelectricity in an environmentally friendly manner over the 50-year term of a new license. Operations will comply with the most current environmental regulations, Applicant's environmental management plans and permits, and Environmental Best Management Practices (BMPs).

2.3 Other Alternatives

No changes in Project design, construction or maintenance have been proposed by Applicant or other parties.

3.0 STATUTORY AND REGULATORY REQUIREMENTS

3.1 License Process

3.1.1 License

FERC Project No. 12532 is under consideration for an original license. The Project is located at Pine Creek Mine north of Bishop, California in northern Inyo County at the top of Pine Creek Canyon, above the confluence of Morgan and Pine Creeks. When licensed and completed, the Project will be the second of two hydroelectric facilities at the mine. The other facility currently operates downhill from the Project on mine property, uses the same water, is exempt from FERC licensing, and supplies electricity to Southern California Edison pursuant to a 20-year CREST agrement.

3.1.2 National Environmental Protection Act Scoping

FERC issued a Scoping Document 1 (SD1) and Commencement of License Proceeding for the Project on May 20, 2011. FERC held a formal public or agency scoping meeting and site visit on June 21, 2011. Stakeholder comments were filed with FERC regarding SD1, and on July 20, 2011 FERC issue a Scoping Document 2 (SD2). SD2 was issued to parties interested in the License proceedings. On April, 22, 2012 the USFS disputed the proposed studies for Seismic (FS.1), Geotechnical (FS.2) and Water Quantity (FS.5). On July 1, 2012, FERC issued a Final Director's Dispute Study

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Plan Determination directing Applicant to undertake the approved studies as described in the Determination.

3.1.3 Notice of Intent and Pre-Application Document

Licensing of the Pine Creek Mine Tunnel Hydroelectric Project was initiated on February 29, 2008 when Applicant filed with FERC a Pre-Application Document (PAD) and a Notice of Intent (N01) to license the Project. The PAD was distributed to federal and state resource agencies, local governments, Native American tribes, and interested members of the public simultaneously with its filing with FERC.

3.1.4 Application for Non-Federal Representative Status

Applicant requested designation as the non-federal representative for informal consultation under applicable statutes. On March 13, 2013, in accordance with 35 CFR Part 800.2(cX5), Applicant requested that FERC grant Pine Creek Mine, LLC authorization to initiate Section 106 consultation authority on the Commission's behalf for the purposes of day-to-day Section 106 consultation, as described in the National Historic Preservation Act, with the California State Historic Preservation Officer (SHPO), US National Forest Service, and Native American Tribes. FERC granted this request on March 27, 2013.

3.1.5 Study Plan Development, Implementation, and Reporting

In consultation with agencies and interested parties, Applicant developed a Revised Proposed Study Plan (PSP) package describing Pine Creek's intent to conduct ten License studies:

See Table 3.1 On Next Page

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Table 3.1. Studies Finalized and Their Availability

Study No.	Study Description	Overall Progress of Study Plan	Completed Studies Date & Availability
PC.1	Historic Assessment and Heritage Resources Study	Completed	7/2015
PC.2	Bat Assessment	Completed	3/5/2013
PC.3/FS.7	Special-Status Wildlife Assessment	Completed	3/5/2013
PC.4/FS.9	Noxious Weeds Study	Completed	3/5/2013
PC.5/FS.10	Aquatic Macroinvertebrates	Completed	3/5/2013
FS.1	Seismic	Completed	3/5/2013
FS.2	Geotechnical	Completed	3/5/2013
FS.5	Water Quantity (Flow)	Completed	3/5/2013
FS.6	Heritage Resources and Consultation with Native Tribes	Completed	7/2015
FS.8/FERC.1	Special Status Plant Assessment	Completed	3/5/2013

3.1.6 Initial Study Report

Applicant conducted field studies during 2012 in accordance with the FERC-approved study plans. All final study results and analyses were presented in Applicant's Initial Study Report (ISR), which was filed with FERC and distributed to agencies and interested parties on March 31, 2013. An ISR Meeting was held in Bishop, California on April 15, 2013 and a summary of the ISR meeting was filed with FERC on April 30, 2013. All studies included in FERC's Study Plan Determination for the Project are complete. Figure 3.1 shows the various study area boundaries.

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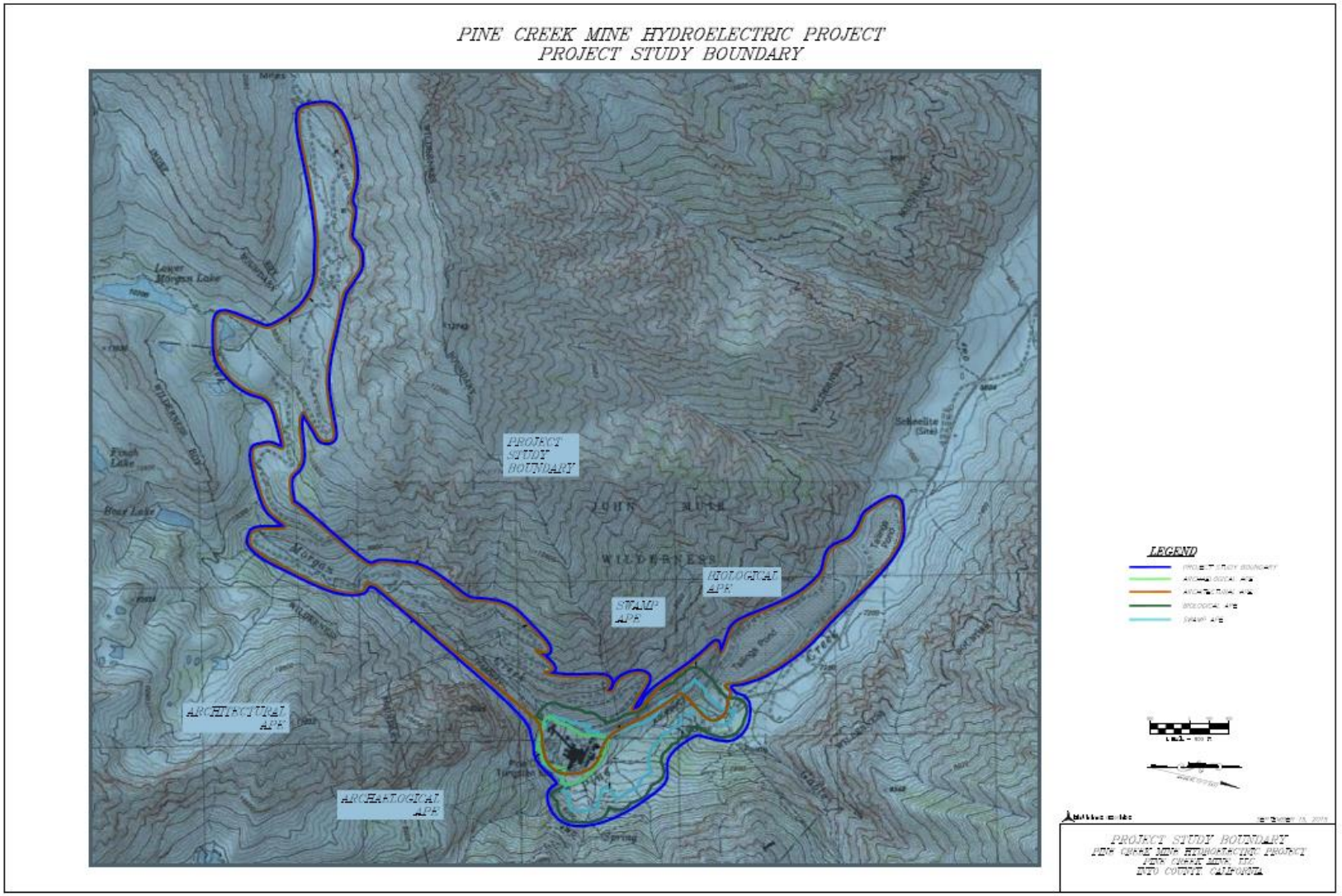

Figure 3.1 — Pine Creek Mine Site – Project Study Boundary.

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3.1.7 License Application Milestones

Table ES-1 in the Executive Summary (at page ES-3), filed as part of this application, lists the Project's licensing milestones, filings and consultation meetings.

Table 3.1.2 Project License Milestones by Date

Responsible Entity	Pre-Filing Milestone	Date
Applicant	File NOI/PAD with FERC	2/29/2008
FERC	Study/Tribal Meetings	4/2/2011
FERC	Issue Notice of Commencement of Proceeding; Issue Scoping Document	5/20/2011
FERC	Pine Creek Project Site Visit and Scoping Meetings	6/21/2011
All stakeholders	PAD/SD1 Comments and Study Requests Due	7/20/2011
FERC	Issue Scoping Document 2	7/20/2011
Applicant	File Proposed Study Plan (PSP)	11/02/2011
All stakeholders	Proposed Study Plan Meeting	12/2/2011
All stakeholders	Proposed Study Plan Comments Due	1/31/2012
Applicant	File Revised Study Plan	3/1/2012
All stakeholders	Revised Study Plan Comments Due	3/16/2012

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Responsible Entity	Pre-Filing Milestone	Date
FERC	Director's Study Plan Determination	4/2/2012
Dispute Panel	Dispute Resolution Panel Convenes	5/12/2012
Dispute Panel	Dispute Resolution Panel Findings Issued	6/11/2012
FERC	Director's Study Dispute Determination	7/1/2012
Applicant	First Study Season	Summer 2012
Applicant	Initial Study Report	3/31/2013
All stakeholders	Initial Study Report Meeting	4/15/2013
Applicant	Initial Study Report Meeting Summary	4/30/2013
Applicant	File Preliminary License Proposal	6/01/2015
All stakeholders	Preliminary Licensing Proposal Comments Due	8/31/2015
Applicant	File Final License Application	2/11/2016
Applicant	Issue Public Notice of License Application Filing	2/24/2016
FERC	Issue letter of request for deficiencies & additional information	4/08/2016
Applicant	File revised Final License Application	7/7/2016

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3.2 Compliance with Applicable Federal Laws

3.2.1 Federal Power Act of 1920, as Amended (16 USC § 791-828c)

The Federal Power Act of 1920, as amended, is the most important legislation regarding hydropower and transmission line license. Several sections of the FPA are particularly relevant to License. Section 4(e) contains two key standards. The first is equal consideration, which requires FERC to give equal consideration, but not necessarily equal weight, to developmental and environmental values when considering license issuance. The second is mandatory conditioning authority, which applies to projects located on "federal reservations," and provides an opportunity for the federal agency with the responsibility for managing the reservation to file with FERC the terms and conditions to protect the reservation that FERC must include verbatim in any license issued for the Project. However, the Project is not located on any federal reservations and therefore this section is not applicable to the Project.

3.2.2 Federal Endangered Species Act of 1973, as Amended (16 USC § 1531 et seq.), Section 7 Consultation

Section 7 of the federal Endangered Species Act (ESA) requires FERC's consultation with the United States Fish and Wildlife Service (USFWS) regarding the potential that a FERC license for the Project might jeopardize ESA-listed species or modify Critical Habitat for those species.

The *Final Revised Proposed Study of Special Status Wildlife* states that operation and maintenance of the Project may have a significant, measurable adverse effect on special-status wildlife, and that the effect may be direct, indirect or cumulative. The biological surveys on an approved list of target wildlife species included the Sierra Nevada Bighorn Sheep (Ovis canadensis sierra) (SNBS), special status bats, special status salamanders, and the Yosemite Toad (Bufo canorus). No special status B wildlife was detected within the Project study area during the surveys. However, SNBS are known to inhabit the greater Project Boundary area. The Project is located within the U.S. Fish and Wildlife Service (USFWS)-designated Critical Habitat for the SNBS and SNBS have been detected within the Project area. Critical Habitat for the SNBS was designated by the USFWS on August 5, 2008 and the Project is located within the Wheeler Ridge Unit, which is part of the Central Recovery Unit. Between 1999 and 2011, the SNBS population of this unit has increased from just over 100 animals to approximately 400 (CDFW 2012). Of the 12 Herd Units required for recovery (USFWS 2007), four units remain vacant as of 2011 (CDFW 2012). However, the Project is not anticipated to have any adverse impacts, direct, indirect, or cumulative, on SNBS.

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3.2.3 Clean Water Act Section 401 Water Quality Certification

Section 401 of the Clean Water Act (CWA) requires that project licenses issued by FERC, which may result in a discharge of pollutants into waters of the United States, must obtain state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Pine Creek Mine currently discharges water from the existing ore body by conduit into Morgan Creek using the Pine Creek Mine Water Discharge System which occurs under its existing water discharge permit. Constituents analyzed during water quality monitoring, as recommended by the State Water Resources Control Board between 1999 and 2007, satisfied the requirements of the NPDES permit issued to Pine Creek Mine, LLC on July 28, 2004. Riparian water has been discharged from the mine for decades without indication of pollutants. In light of the fact that no proposed modification to the source of water or discharge system are anticipated for the Project, the certification under Section 401 appears unnecessary.

3.2.4 Wild and Scenic Rivers Act, as Amended (16 USC § 1271-1287)

Rivers protected under the Wild and Scenic Rivers Act are designated as such for their outstanding remarkable scenic, recreational, geologic, biological, historic, cultural, or other similar values. According to the National Wild and Scenic Rivers system, these rivers shall be preserved in free-flowing condition, and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The goal of the wild and scenic designation is not to prevent use of the river, but rather to manage the river and its existing resources so they are compatible with use. The Project region does not include any areas that have been included in the federal Wild and Scenic Rivers program.

3.2.5 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended, requires consultation in regards to the potential for a federal action to adversely affect Essential Fish Habitat (EFH). No watercourses or EFH are affected by the Project.

3.2.6 Wilderness Act of 1964, as Amended (16 USC § 1131-1136)

The Project Study Boundary does not include any areas that have been included in or are proposed for inclusion in the federal Wilderness Act.

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3.2.7 National Historic Preservation Act (16 USC § 470 et seq.)

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations found at 36 CFR § 800 require federal agencies to take into account the effects of their undertakings on historic properties within a project's Area of Potential Effects (APE).[2] Pursuant to 36 CFR § 800.16, an undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those requiring a federal permit, license or approval. In this case, the undertaking would be FERC's issuance of an original new license to Applicant for the Pine Creek Mine Tunnel Hydroelectric Project. Potential effects that may be associated with this undertaking include any Project-related effects associated with the day-to-day O&M of the Project after issuance of a new license.

Historic properties are any prehistoric or historic district, site, building, structure, object, or traditional cultural property included in or eligible for inclusion in the National Register of Historical Places (NRHP) [36 CFR § 800.16(1)]. In most cases, cultural resources less than 50 years old are not considered eligible for the NRHP; however, a property achieving significance within the past 50 years is eligible if it is of exceptional importance. Cultural resources also must retain integrity (i.e., the ability to convey their significance) to qualify for listing in the NRHP. For example, dilapidated structures or heavily disturbed archeological sites may not retain enough integrity to relay information relative to the context in which the resource is considered to be important and, therefore, eligible for listing on the NRHP.

As part of the Section 106 process, federal agencies and their representatives are required to participate in consultation on any findings and determinations regarding an undertaking's effect on historic properties [36 CFR§ 800.2(a)(4)]. Consulting parties include: (1) the State Historic Preservation Officer (SHPO); (2) Indian tribes; (3) local governments; and (4) individuals and organizations with a demonstrated interest in the project. Section 106 requires that federal agencies seek concurrence from the SHPO on any determinations of NRHP eligibility and findings of effect to historic properties, and notify the Advisory Council on Historic Preservation (Council) on any finding of adverse effects. Additionally, federal agencies must make a reasonable and good faith effort to identify Indian tribes and other consulting parties that might attach religious and cultural significance to historic properties that may be affected by the undertaking [36 CFR§ 800.3(f)(2)], and gather information to assist in the identification of such properties [36 CFR § 800.4(a)(3), (4)].

On March 27, 2013, FERC designated Applicant as FERC's non-federal representative for purposes of conducting informal consultation under Section 106. Consultation

[2] Under 36 CFR § 800.16(d), the "Area of Potential Effects" (APE) is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historical properties, if any such properties exist."

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included obtaining SHPO's concurrence on the Project's APE and communicating with interested tribes and agencies regarding the Project License and cultural resources study results.

In a letter dated December 2, 2015, the State Historic Preservation Officer concurred with a finding that the undertaking will result in no adverse effect to historical properties, per 36 CFR 800.5(b), as a result of the proposed Pine Creek Mine Hydroelectric Project.

A copy of that letter was e-filed with FERC on December 2, 2015. A copy of the letter is located on page E-122 of the FLA.

3.2.8 National Environmental Policy Act (42 USC § 4321 et seq.)

The NEPA of 1969 identifies environmental protection as a major national policy objective. The NEPA requires all federal agencies involved in the permitting of activities affecting the environment, such as the issuance of a license for the Project, to evaluate environmental effects and the significance of these effects. The NEPA process is to identify and assess the reasonable alternatives to proposed actions, and federal agencies are to use all practical means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions upon the quality of the human environment. FERC is the lead federal agency in the License process; other federal agencies may voluntarily act as cooperating agencies in FERC's analysis of environmental effects. FERC is bound by the statutory requirements of the NEPA and maintains a policy of adhering to the objectives of the NEPA.

An Environmental Assessment (EA) is typically the NEPA document prepared for an application for a new license. Depending on the location or scope of the proposed project, or the resources affected, FERC may, in specific circumstances, prepare an Environmental Impact Statement (EIS). In rare circumstances, FERC prepares an EIS after preparation of an EA.

The EA acts as a disclosure or guidance document in which FERC considers the effects of proposed actions and possible protection, mitigation, and enhancement measures; assesses the environmental effects of licensing the Project; and concludes that licensing the Project is (1) not a major federal action significantly affecting the quality of the human environment, or (2) a major federal action significantly affecting the quality of the human environment, and therefore requires an EIS.

3.2.9 Americans with Disabilities Act of 1990 (Public Law 101-336)

Public recreation facilities must comply with the Americans with Disabilities Act (ADA), as amended. FERC, however, has no statutory role in implementing or enforcing the ADA as it applies to its licenses. Applicant's obligation to comply with the ADA exists

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independent of its FERC project license. No public recreation facilities are associated with the Project.

3.3 Compliance with Applicable California Laws

3.3.1 California Endangered Species Act (Fish and Game Code § 2050-2116) and Fully Protected Species Statutes (Fish and Game Code §3505, 3511, 4700, 5050, 5515, and 5517)

The California Endangered Species Act (CESA), enacted in 1984, is codified in the Fish and Game Code (Division 3, Chapter 1.5). The CESA is patterned after the ESA and is administered by the California Department of Fish and Wildlife. Species may be listed under the CESA as endangered (referred to in this Final License Application document as SE) or threatened (referred to in this Final License Application document as ST).[3] If a project may affect species listed jointly under the ESA and CESA, CDFW must participate in ESA Section 7 consultation to the maximum extent possible. The federal Biological Opinion (BO) will generally reflect both California Fish and Wildlife's and USFWS's or NMFS's findings, and California Fish and Wildlife is encouraged by the CESA to adopt, when possible, USFWS' or NMFS' BO as California Fish and Wildlife's own formal written determination on whether jeopardy exists. However, if California Fish and Wildlife ultimately does not agree with USFWS or NMFS, California Fish and Wildlife may issue an independent CESA determination.

During licensing efforts, a total of one listed, or candidate species was identified as potentially occurring in the general Project locale: no fish, one mammal and no birds. The Final Revised Proposed Study of Special Status Wildlife included CESA-listed species with the potential to occur within the study area of the Project.

3.3.1.1 California General Plan Law (Government Code § 65300 et seq.)

The General Plan Law of the State of California requires that each local government in California prepare a "general plan" that establishes the land use policies and details the likely future development patterns within the local government's boundaries. Zoning ordinances and subdivision procedures must be consistent with the general plan. There are seven required elements of the general plan: land use, circulation, housing, conservation, open space, noise, and safety. In general, governments can and often do

[3] California Fish and Wildlife, pursuant to its goal of maintaining viable populations of all native species, also designates "species of special concern" (referred to in this application as SSC) when, in CDFW's opinion, declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The SSC designation is an administrative term and has no legal status.

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add other elements to their general plans; consequently, general plans typically change over time. The Pine Creek Mine property has long been an area within a general plan designation as Open Space.

3.3.2 California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.)

In 1970, the State of California enacted the California Environmental Quality Act (CEQA). Like NEPA, CEQA was created to require public agencies to identify the potential environmental impacts of proposed projects. CEQA requires public agencies to describe both the significant impacts of proposed projects and the feasible alternatives or feasible mitigation measures that will avoid or substantially lessen those significant impacts. The public agency that has the greatest responsibility for supervising or approving the project is the "lead agency" for the CEQA analysis. The lead agency determines if the Project is subject to CEQA or exempt from the CEQA process. If the Project is subject to CEQA, the lead agency prepares an Initial Study to identify the Project's potential environmental impacts and to determine if any of those impacts may be significant.

After a determination regarding the significance of potential impacts, the lead agency will create one of three types of environmental review documents. If the Project is found to have no significant impacts, a Negative Declaration will be prepared. If the Project has been modified to mitigate or avoid significant impacts, a Mitigated Negative Declaration will be prepared. If the Project is found to have potentially significant impacts, or if a detailed analysis of the Project's potential impacts is determined to be appropriate, an Environmental Impact Report (EIR) will be prepared. The EIR provides state and local agencies and the general public with detailed information on potentially significant environmental impacts that a proposed Project is likely to have, lists ways the impact or impacts may be minimized, and describes alternatives to the Project.

Typically, CEQA review is initiated for hydropower projects when the State Water Resources Control Board (SWRCB) issues a Section 401 Water Quality Certificate for the Project.

3.3.3 California Wild and Scenic Rivers Act (Public Resources Code § 5093.50 et seq.)

The California Wild and Scenic Rivers Act was enacted in 1972 to preserve designated rivers possessing extraordinary scenic, recreation, fishery, or wildlife values. Like the federal act, the state Act provides protection for a river or river segment to remain free flowing, and allows for the construction of water diversion facilities only if the Resources Secretary determines that the facility is needed to supply domestic water to local residents and the facility will not adversely affect the river's free-flowing condition and natural character. The Act requires state and local agencies to exercise their existing powers consistent with the Act's policies and provisions. Initially, the Act required the implementation of a management plan for each river or river segment designated as Wild and Scenic, but the amendments of 1982 eliminated this requirement, instead

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requiring the resource agency to coordinate activities affecting the system with other federal, state and local agencies. State designated rivers may be added to the federal system upon the request of the Governor of California and the approval of the Secretary of the Interior. Future management of state rivers added to the federal system is the responsibility of the state.

The Project Area does not include any sections of river designated or proposed for designation under the State Wild and Scenic Rivers program. The nearest State-designated Wild and Scenic River is the Cottonwood Creek which originates in the Ancient Bristlecone Pine Forests of the White Mountains of eastern Inyo County, California.

4.0 CUMULATIVE EFFECTS

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act, an action may cause cumulative effects if its impacts overlap in space or time with the impacts of other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time, including hydropower and other land and water development activities.

4.1 Cumulatively Affected Resources

Prominent issues identified in FERC's Scoping Document included the following Aquatic Resources analyzed for cumulative impact, as well as site-specific effects:

- Effects of project construction, operation, and maintenance on water quality, including dissolved oxygen, turbidity, and temperature in Pine Creek.
- Effects of project construction, operation, and maintenance on minimum flow in Pine Creek.
- Effects of project construction, operation, and maintenance on the potential for flooding in Pine Creek.
- Effects of project construction and operations on fishery resources in Pine Creek.

Based FERC's Study Plan Determination, on Applicant's PAD, information in the Initial Study Report and Preliminary License Proposal, no resources affected by the Project or its construction are subject to cumulative effects.

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4.2 Geographic Scope

The geographic scope of the cumulative effects analysis defines the physical limits or boundaries of the proposed action's effect on the resources. Since the proposed action would affect the resources differently, the geographic scope for each resource may vary.

No cumulatively affected resources were identified during Project scoping; FERC did not designate a geographic scope.

4.3 Temporal Scope

The temporal scope of a cumulative effects analysis includes a discussion of past, present, and future actions and their effects on each resource that could be cumulatively affected. For any resource that was identified as potentially having cumulative effects, the temporal scope will look 30-50 years into the future, based on the potential term of a new license, concentrating on the effect on the resource from reasonably foreseeable future actions. The historical discussion will, of necessity, be limited to the amount of available information for each resource area.

No cumulatively affected aquatic resources were identified in the ISR; FERC did not designate a temporal scope.

5.0 GENERAL DESCRIPTION OF THE RIVER BASIN

The Project lies within the Owens River Basin on the east side of the Sierra Nevada Mountain Range in the State of California. The basin encompasses a total of 3,130 square miles. A small portion of the northeast corner of the watershed extends into the State of Nevada (USGS, 1981). The Owens River is the largest drainage on the eastern face of the Sierra Nevada Range. It flows south parallel to the mountains. It is approximately 120 miles long, originating in southwestern Mono County, approximately 25 miles east of Yosemite Village and south of Mono Lake (USGS, 1981). It travels southeast through the Lake Crowley Reservoir, then descends to the Owens River Gorge. The Owens River flows in a closed hydrologic basin, meaning that it historically passed through Owens Lake before terminating in a closed basin lake, China Lake. Figure 5.1 provides an overview of the Owens River.

Decades ago the Los Angeles Department of Water and Power (LADWP) installed an aqueduct that collects Owens River water for export to Southern California, essentially drying up the Owens Valley. In late 2006 a restoration project was implemented to restore 5% of the post-aqueduct flows to the lower river. The Owens River Basin and the adjacent Mono Lake Basin are the source of 80% of the water used by the City of Los Angeles. Diversions from the Owens River and its tributaries into the Los Angeles Aqueduct have resulted in the evaporation of Owens Lake at the end of the river, which formerly covered 75 square miles.

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The Project is located north of Bishop, California, at the top of Pine Creek Canyon, above the confluence of Morgan and Pine Creeks, two of many tributaries in the Owens River Basin. Morgan Creek is an ephemeral creek that flows for a total of 2.7 linear miles from its headwaters at 9,200 ft. elevation to its terminus at 7,800 ft. elevation, where it joins Pine Creek. Pine Creek is a total of 9.9 linear miles in length from its origination at an elevation of 11,120 ft., at Pine Creek Pass, to its terminus at 7,800 ft. elevation, where it joins Morgan Creek (USGS, 1981). Figure 5.2 shows the location of the Project in relation to the creeks. This Project has a unique subterranean Project boundary in that the underground mine tunnel system houses all of the Project facilities. The Project area depicted on Figure 5.2 is the Project area extrapolated to the land surface directly above the underground portions of the Project and the above ground portions of the FERC Project Boundary located on private land.

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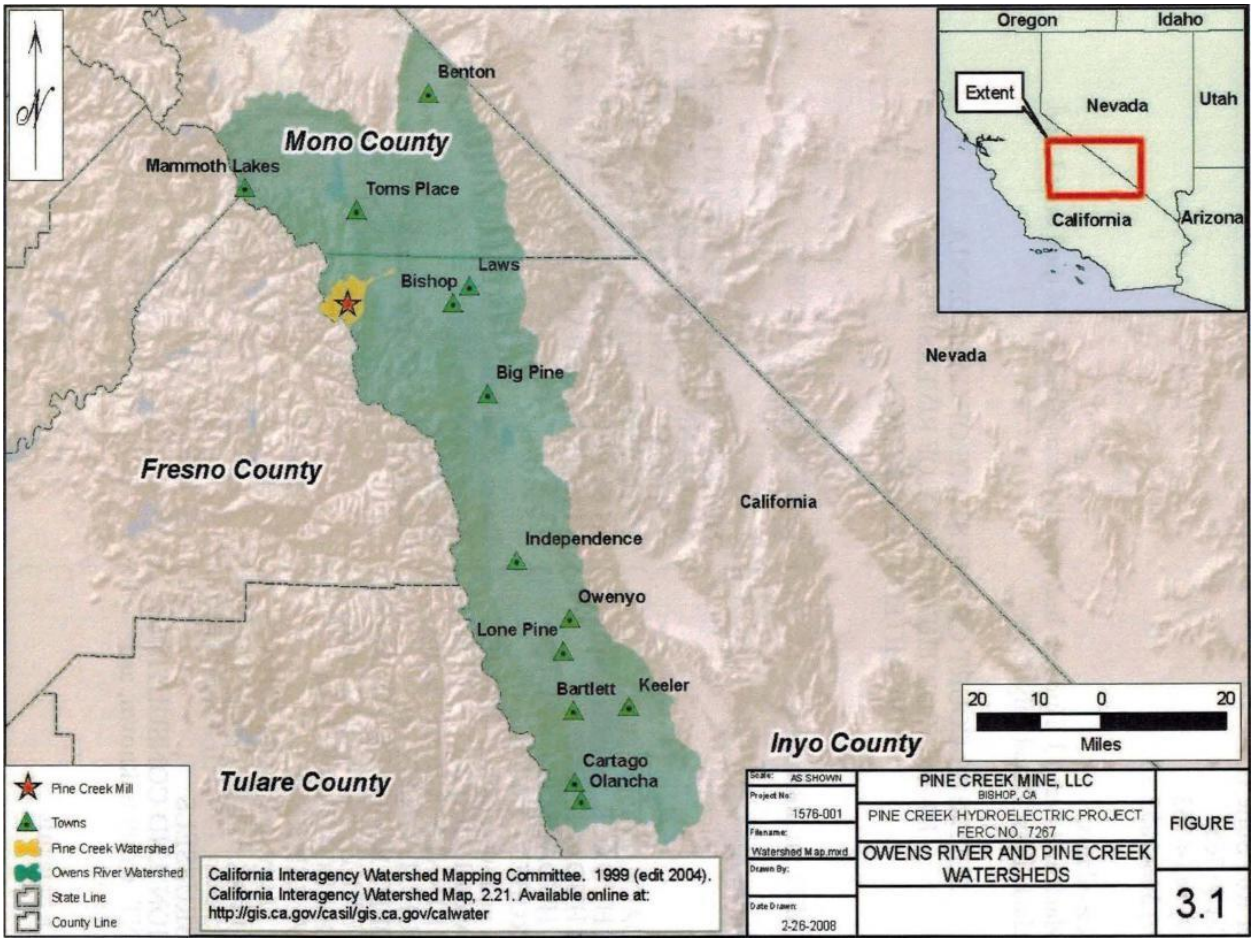

Figure 5.1. Owens River and Pine Creek Watersheds

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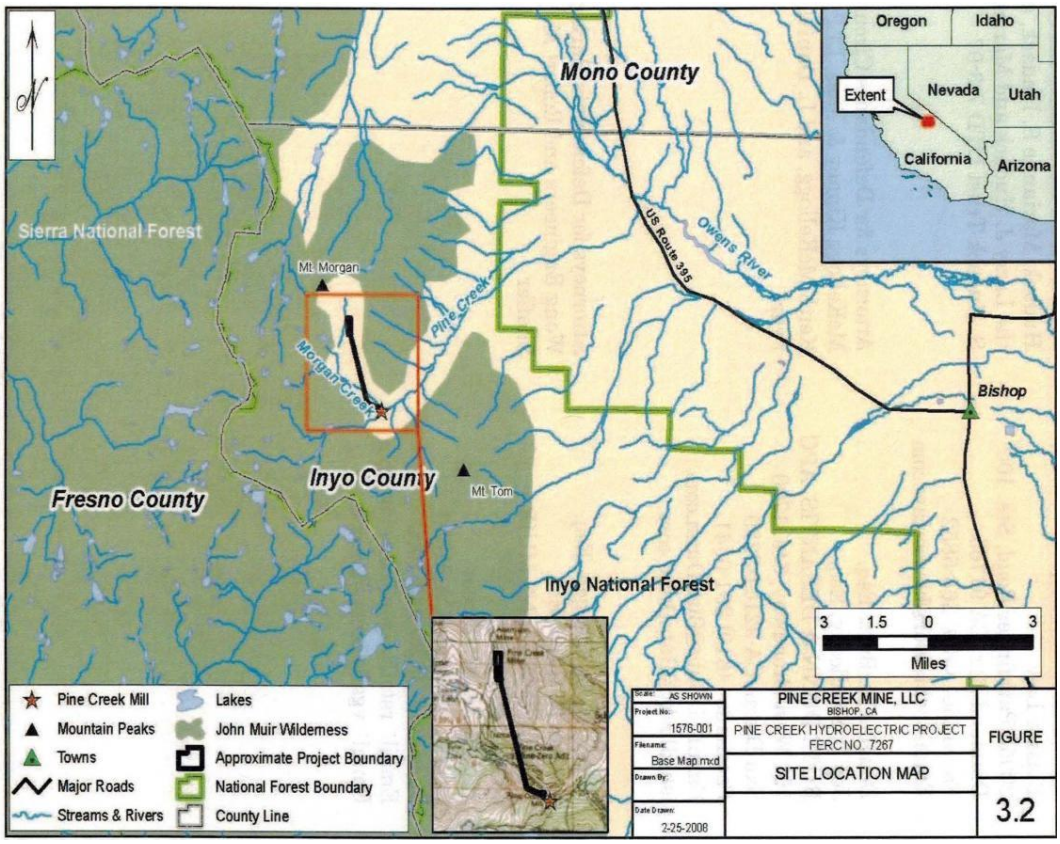

Figure 5.2. Site Location Vicinity Map

6.0 ENVIRONMENTAL ANALYSIS OF GEOLOGIC RESOURCES

6.1 Affected Environment

The Project site is located along the base of the Sierra Nevada eastern escarpment near the western edge of Owens Valley. The escarpment serves as the boundary between the Great Basin and Sierra Nevada geologic provinces. The Sierra Nevada province is a north-northwesterly trending, asymmetric, tilted fault- block. Predominant basement rock types of the Sierra Nevada include Cretaceous granitics with associated Paleozoic roof pendant rocks.

More specifically, the site is located at the western boundary of the Excelsior-Coaldale section of the Walker Lane Belt (WLB). The WLB is approximately 700 km long and 100 to 300 km wide and is characterized by Quaternary faults extending from the Garlock fault northward into northeastern California.

Sierra Geotechnical Services, Inc. (SCSI) performed a geotechnical and seismic study on Pine Creek Mine's existing concrete tunnel plug. It was prepared in response to a letter issued by the USFS/Inyo National Forest District Ranger dated February 16,

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2005, which centers on the present condition of the plug and the suitability of the plug for service as part of a water reservoir.

SCSI performed a geotechnical evaluation using underground mine maps, underground geologic mapping, and standard assessment procedures as applied by a California registered geologist or engineer with a certification as a geotechnical engineer. Design and construction of the tunnel plug as well as the characteristics of the surrounding environment in the mine were reviewed to determine the ability of the plug to meet its intended purpose.

SGSI performed detailed structure logging of the Easy-Go Adit bedrock for a distance of 100 feet out from each tunnel plug face with particular emphasis on any discontinuities, including joints, joint in fill character (i.e., soluble, erodible, tight, etc.), shears, faults, seepage, fractures, and lithology. The results of the structure log confirm that the plug was constructed at a stable location in the adit, within solid diorite that is relatively free of significant shearing.

The following response is provided by SCSI pursuant to the Deficiencies and Additional Information Request Letter prepared by the Federal Energy Regulatory Commission, regarding the application for the Pine Creek Tunnel Hydroelectric Project P-12532-006, dated April 8th, 2016. (See 15.2 Consultation Documentation)

Comment 9: *An unexpected release of approximately 200 acre-feet of water under 1,320 feet of head has the potential to cause serious damage to any structures downstream. Please specify the expected discharge from the project should the plug fail during project operation. Please also provide a description of the probable zone of inundation that would be flooded if the concrete plug failed, including any structures that would be located within the inundation zone.*

In response, initially we find the probability of an instantaneous and complete failure of the tunnel plug to be very low. The plug was engineered to withstand a design level earthquake event. The plug location was chosen because of the quality of the rock mass, which is monolithic, impermeable and has little to no jointing and fracturing. The plug is capable of withstanding a pressure force of 867 psi (Nasser 2002). Impound test data from 2003 showed water levels reached a maximum recorded height of approximately 1,219 feet of head (528 psi, 250 acre feet), which is approximately 281 feet below the maximum impoundment height where water can exit to daylight from the adit 1,500 feet above the bulkhead. The pressure force will not exceed the design parameters.

The plug is adequate in length, the walls were well roughened, the stress in the rock is applied uniformly, and the tunnel walls in the area of the plug are tapered, putting much of the contact area into compression. In addition, there is redundancy in the resistance to failure available in the plug configuration. Both longitudinal shear and wedging blowout tension are resisting the downstream movement of the plug. These two resistive mechanisms may be assumed to share the applied load.

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Even in the event of a greater than design level earthquake, the likelihood of catastrophic failure is remote. The plug is anchored in quartz diorite (granite) along a solid part of the adit, with very limited fracturing. However, if somehow the plug did fail during a larger than designed event, it's likely that the water flow and velocities would be impeded/suppressed by dislodged rock from heavily fractured areas upstream and downstream of the plug; fallen rock would create a partial dam effect, thus limiting the amount of water flow. Please see the SGSI report titled Seismic, and Geotechnical Study ¬Easy Go Adit Tunnel Plug, Pine Creek Mine, for further discussion of the geologic, seismic and structural design of the tunnel plug.

That said, included below are flow rate, velocity, depth, and time period analyses in the event of an instantaneous and complete failure of the tunnel plug (worst case scenario) and release of the 250 acre-feet of impounded water. It is assumed that there is no loss or infiltration of the runoff volume as it travels downstream.

In this worst case scenario, the initial runoff rate is calculated via a HecRas Model from the mine to just past the town of Rovana (approximately 38,000 ft). The initial calculated flow rate exiting the EZ-Go Adit would be approximately 14,143 cubic feet per second (cfs) with a velocity of 89 feet per second (ft/s). Both the rate and velocity quickly drop, however, as water empties from the mine. The total time of release is approximately 23 minutes due to the relatively low volume of impounded water, which is approximately two hundred fifty acre-feet or equivalent to 126 Olympic sized swimming pools.

Downstream flow velocities would rapidly dissipate from approximately 14 to 18 fps in the vicinity of the tailings and Pack Station, to approximately 10 fps in the vicinity of Rovana. Breach water stays primarily within the relatively well incised Pine Creek drainage. The width of the flow is estimated at less than 200 feet in the drainage. Depth of the flow is partly controlled by topography and varies from approximately 12 feet at the mine area to approximately 5 feet near Rovana. The flow path is outlined in blue in the Figures.

The initial high velocities would likely lead to severe erosion within and outside the tunnel and damage to structures directly below the opening and at the mine site. Water would also impact the Pack Station parking area and large portions of Pine Creek Road. Near Station 190 the bridge crossing would likely be damaged. Water skirts the edges of the tailing piles and may pick up additional debris. Liquefaction of the tailings piles though is considered low. At Rovana, the flow appears to just miss the homes on the southern edge of the bluff.

Again we stress that the modeling was based on a worst case scenario which is unlikely to occur. Overall in a real world scenario, where the plug would be damaged but would remain in largely in place, failure would be significantly less than that modelled here.

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It is important to note that this analysis was performed on available USGS mapping and that further analysis could be performed with local aerial or ground topography to develop a more accurate model, if needed. The results would more accurately locate the precise edges of flow and velocities, but since the likelihood of this type of breach is so low, this analysis gives a reasonably accurate indication of potential damages.

Comment 10: *Your application states that the maximum head on the project would be 1,320 feet Please provide a description of what would happen should water levels in the mine rise above 1,320 feet, including where the water would exit the mine.*

Prior to the advancement of the EZ-Go adit in the 1960's, at an elevation of roughly 8,000 feet, the potentiometric surface of groundwater was at about 9,500 feet (HCI, 1990), which is the approximate level of the 1500 or Zero adit. The levels above the Zero adit ¬"A" level and higher (11,000 feet and above) - were essentially dry. Therefore, we can assume that the point of equilibrium for groundwater is likely somewhere between the Zero and "A" levels, if not closer to the Zero adit.

The approximated point of equilibrium is further validated by the recorded water height following impoundment in 2002/2003. Impounded water reached a recorded high of 9319 feet or just below the Zero adit. Though this height was measured prior to the snowpack runoff period, it is likely that water levels would not substantially rise past the Zero level, given the data. However, if water were to somehow exceed this level, it would most likely exit the mine though the Zero adit.

6.2 Project Effects

Rare landslides have been known to occur in the mountains surrounding the mine. However, landslides are unlikely to affect the Project since it will be located inside the Easy-Go Tunnel. For the same reason, erosion from the Project can be ruled out. Project-induced sedimentation was not observed during field studies.

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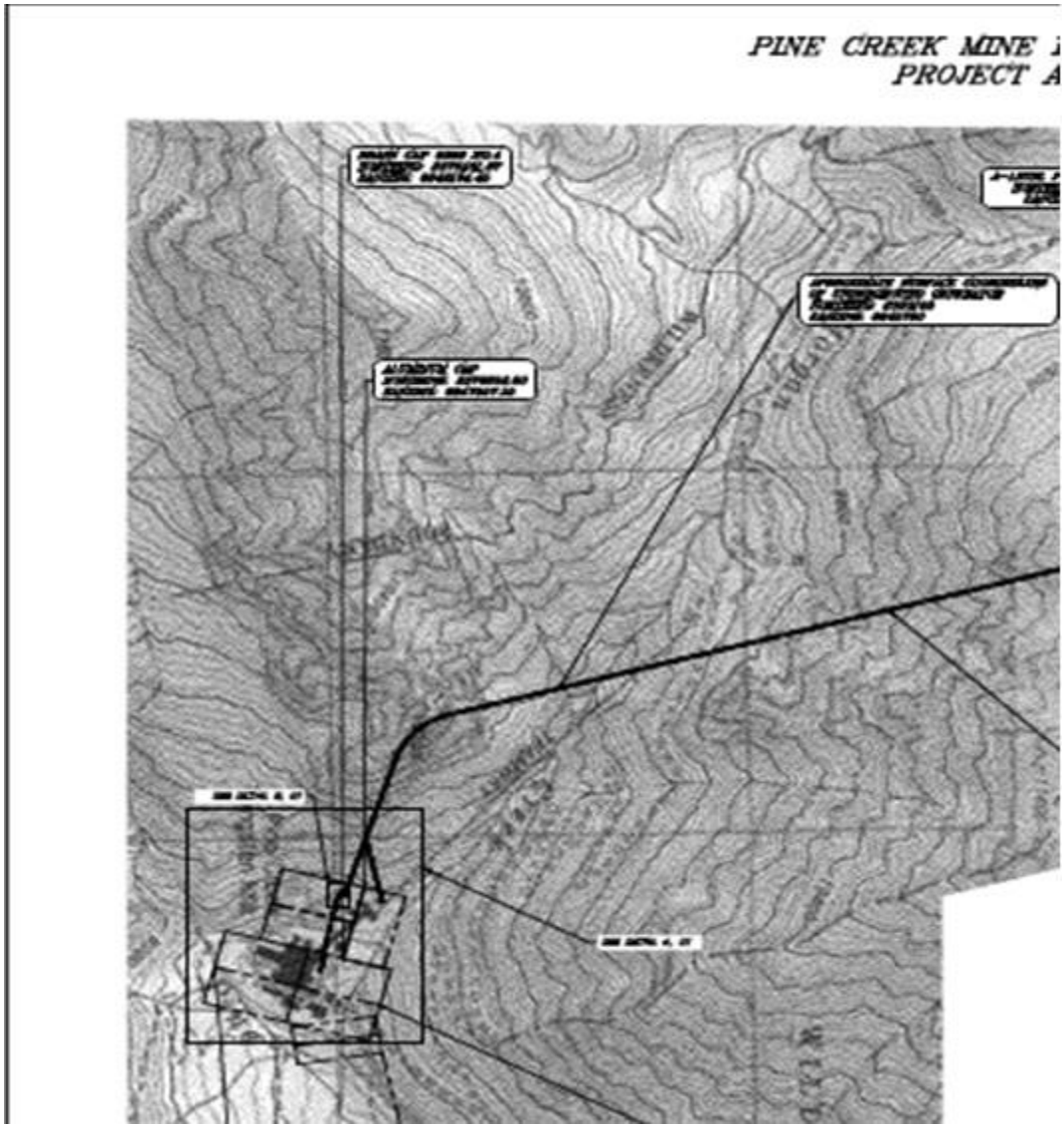

Figure 6.1a — A portion of Exhibit G-2 shows the footprint of the subterranean features projected to a surface map to indicate the project boundary's total footprint. This section shows the mill site and a portion of the Easy Go tunnel (Detail Map 1 of 2).

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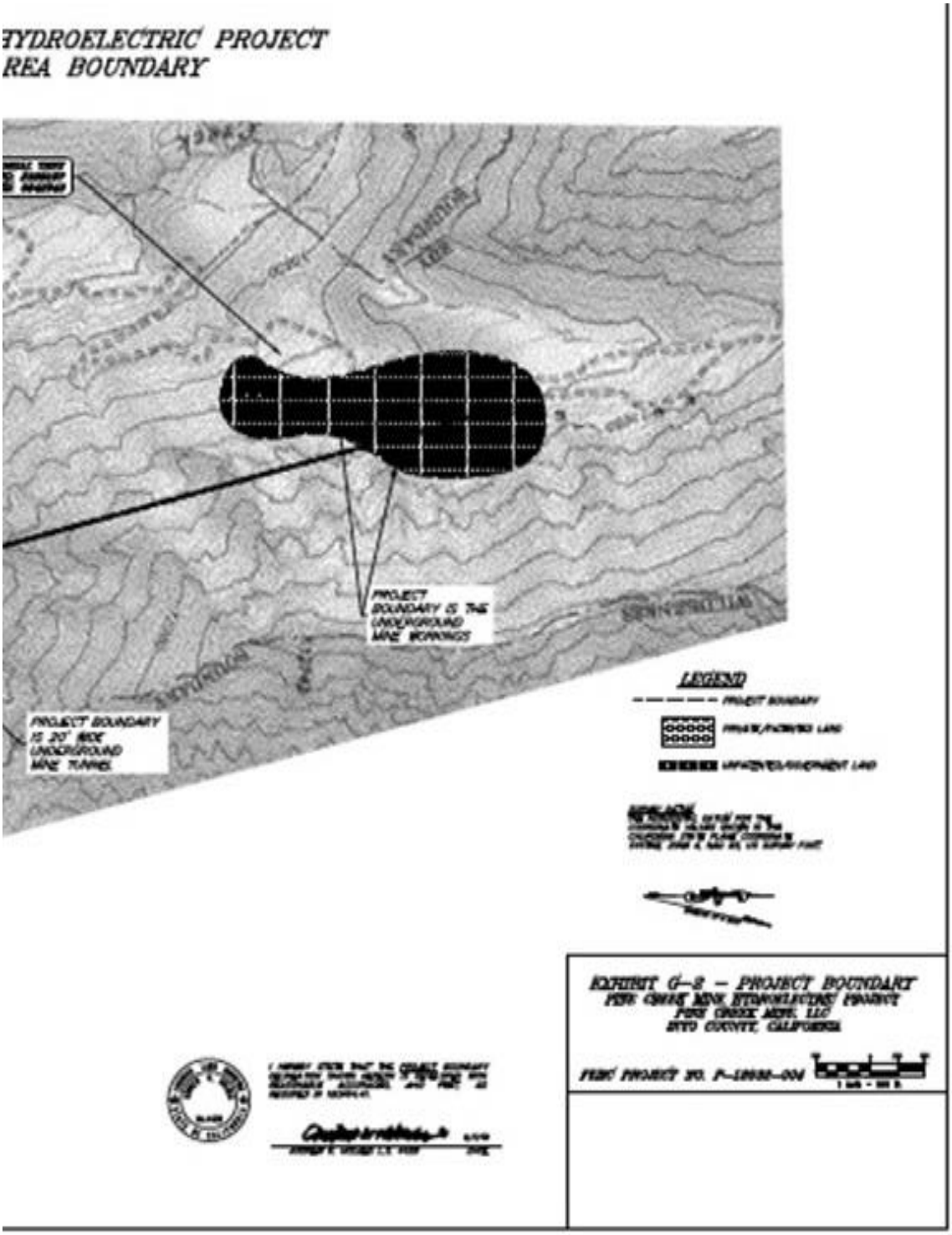

Figure 6.1b - A portion of Exhibit G-2 shows the footprint of the subterranean features projected to a surface map to indicate the project boundary's total footprint. This section shows the remaining portion of the Easy Go tunnel to the underground mine workings (Detail Map 2 of 2).

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6.2.1 Applicant-Proposed Measures

No environmental measures directly relating to geologic resources are proposed, and none have been recommended by any resource agency or interested party.

In keeping with applicable studies, no PM&E plans are proposed for geology or soil issues.

Structural Stability Testing of the Plug and Maintenance Plan: instrumentation will be installed and periodic testing conducted to measure the pressures and flows involved in filling and draining the reservoir.

A Maintenance and Repair Plan will be developed as directed to monitor possible seepage at the plug and the rock mass and effect possible repairs.

6.2.2 Environmental Effects of Applicant-proposed Measures

No additional environmental protection measures have been recommended or are proposed.

7.0 ENVIRONMENTAL ANALYSIS OF WATER RESOURCES

7.1 Affected Environment

Stream flow and mining, milling, and natural resource processing uses have historically been the major uses of water in Pine Creek and Morgan Creek. Since the mine opened, water has collected in its underground workings and flows out to Morgan Creek. Downstream from the Project site, water flowing through Pine Creek has historically been used for natural riparian flows as part of the area's headwater location.

7.2 Project Effects on Water Resources

The water currently discharging from the mine has been in contact with the interior surfaces of the mine. Applicant anticipates little or no change in water quality as a result of the hydroelectric generation. Past monitoring of water quality when the mine was filled and drained showed no increase in concentration of soluble minerals. However, Applicant will periodically test mine water for contaminants after the Project comes on line pursuant to a water quality monitoring plan discussed in sections 7.2.1-7.2.2, below.

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Mine Water Discharge Quality Data

In 2004 Applicant performed extensive water quality monitoring in the Project area in response to a December 29, 2003 USFS request that impounded water behind the plug be drained and tested.

The results included regularly, monthly, and one-time analysis results as required by the NPDES permit issued to Pine Creek Mine, LLC on July 28, 2004. Monitoring results satisfied the requirements of the NPDES permit issued to Pine Creek Mine, LLC. Table 7.2.1 below lists the constituents analyzed.

Table 7.2.1: Constituents Analyzed by Pine Creek Mine, LLC During Mine Drawdown and Drainage, in Morgan Creek, 2004

Turbidity
Specific Conductance
pH
Water Temperature
Total Dissolved Solids
Total Sulfide
Total Phosphorus
Nitrate/Nitrite
Ammonia
Kjeldahl (N)
Total Nitrogen
Dichloroethane 1,2-
Dichloroethane 1,1-
Dichloroethane
trans-1,2-Dichloroethene 1,2-
Dichloropropane
cis-1,3-Dichloropropene trans-1,3-
Dichloropropene Ethylbenzene
Methylene chloride 1,1,2,2-
Tetrachloroethane Tetrachloroethene
Toluene
1,1,1-Trichloroethane 1,1,2-
Trichloroethane Trichloroethene
Trichlorofluoromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
Total Dissolved Solids
Purgeable Aromatics and Organics Total
Petroleum Hydrocarbons Diesel Range
Organics Gasolime Range Organics a,a,a-
Trifluorotoluene Benzene
Bromodichloromethane
1,2-Dichlorobenzene 1,3-
Dichlorobenzene 1,4-
Dichlorobenzene 1,1-
Electrical Conductivity
Total Cyanide
Hardness as CaCO3
Organochlorine Pesticides and PCB's
(full sampling suite - see Appendix B)
Oil and Grease
1,1,2-Trichloro-1,2,2-
trifluoroethane
Vinyl chloride
Total Xylenes
Methyl t-butyl ether
1-2-Dichloroethane-d4
Toluene-d8
4-Bromofluorobenzene
Nitrite as N
Ortho-Phosphate
Dissolved Antimony
Dissolved Arsenic
Dissolved Berylilum
Dissolved Cadmium
Dissolved Chromium
Hexavalent Chromium
Dissolved Copper

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Tetracosane
Calcium
Magnesium
Sodium
Potassium
Total Cations
Hydroxide Alkalinity as CaCO3
Carbonate Alkalinity as CaCO3
Bicarbonate Alkalinity as CaCO3
Sulfate
Chloride
Nitrate as N
Fluoride
Bromide
Total Anions
Anion / Cation Balance

Dissolved Iron
Dissolved Lead
Dissolved Manganese
Dissolved Mercury
Dissolved Nickel
Dissolved Selenium
Dissolved Silver
Dissolved Thallium
Dissolved Zinc
Base Neutral and Acid Extracables
Organic Analysis (full sampling suite — see Appendix B)
Asbestos
Dissolved Tungsten

Historically, the mine used water for mining, milling, and processing as well as domestic uses for mine workers and their families. Some agricultural use and flood attenuation water uses occur at or below Rovana on Pine Creek. There are no other known water uses for irrigation, domestic water supply, industrial, or other purposes.

Water Quality Data Downstream

Pursuant to recommendations made by the SWRCB water quality has been monitored in the project area since 1999. From 1999 through 2001 water quality was monitored at three sample sites:

- Discharge Point #001, the point of mine water discharge in Morgan Creek.
- Sample Point #R3, the Morgan Creek — Pine Creek confluence, approximately 1,000-ft. downstream from where the mine discharges water into Morgan Creek; and
- Sample Point #RW, Pine Creek at Rovana, downstream of the Morgan Creek — Pine Creek confluence, where water has to be in compliance with established contaminant levels based on the Basin Plan. Water quality at Rovana is influenced by wastewater from milling operations and tailing ponds in the area that have entered Carpenter Springs and Scheelite Springs.

In 2002, after the mine had suspended production, the SWRCB directed monitoring to continue at only the two sites further downstream, R3 and RW. The variables that Pine Creek analyzed during monitoring are presented in Table 7.2-2. The sampling schedule

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consisted of monthly, quarterly, and annual sampling depending on the constituent of interest (Table 7.2-1).

Table 7.2.2: Constituents Analyzed by Pine Creek Mine, LLC during Water Quality Monitoring as Recommended by the SWRCB, Morgan Creek and Pine Creek, 1999-2007

CONSTITUENT	
Ammonia*	Nitrate*
Arsenic^	pH *
Barium^	Selenium^ Silver'' Sodium*
Boron^	Sulfite*
Cadmium^	Suspended Sediment*
Chloride*	Total Dissolved Solids*
Copper^	Total Nitrogen*
Dissolved Aluminum*	Total Phosphorus*
Dissolved Oxygen*	Turbidity*
Flourine^	Water Temperature*
Iron A	Zinc^
Lead^	
Molybdenum^	

** Monthly or quarterly sample*
**Annualsample*

Table 7.2.2 presents a summary of dissolved oxygen and water temperature information collected pursuant to the SWRCB's recommended monitoring plan. Dissolved oxygen and water temperature data show that Morgan Creek and Pine Creek remain cold and well-oxygenated throughout the majority of the year. Water temperature ranges from 3.1 C (37.5 F) to 15.6 C (60 F), with the warmest temperatures occurring in June, July and August due to high air temperatures and low stream levels. Dissolved oxygen concentrations ranged from 7.60 to 11.10 mg/L, which is representative of quality conditions for coldwater riverine systems.

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Table 7.2.3: Summary of Dissolved Oxygen and Water Temperature Data Collected by Pine Creek Mine, LLC during Water Quality Monitoring as Recommended by the SWRCB, Morgan Creek and Pine Creek, 1999-2003

CONSTITUENT MINE DISCHARGE (1999 TO 2001 ONLY)*						
		1999^	2000^^	2001"	2002^	2003"
Dissolved Oxygen (mg/L)	Min	8.13	7.75	8.15	-	-
	Max	9.75	8.65	9.15		-
	Avg.	8.75	8.18	8.55	-	-
Water Temp C	Min	6.0	7.0	5.5	-	-
	Max	12.0	8.0	6.4	-	-
	Avg.	7.7	7.6	6.0	-	-
Morgan - Pine Creek Confluence (R1)						
Dissolved Oxygen (mg/L)	Min	8.80	-	8.40	-	-
	Max	11.10	-	9.00	-	-
	Avg.	9.51	-	8.66	-	-
Water Temp C	Min	3.5	-	3.1	3.6	2.8
	Max	10.5	-	9.3	15.6	13.3
	Avg.	6.6	-	6.0	10.0	8.5
Pine Creek at Rovana (RW)						
Dissolved Oxygen (mg/L)	Min	7.60	-	8.00	-	-
	Max	9.40	-	8.35	-	-
	Avg.	8.58	-	8.19	-	-
Water Temp C	Min	5.0	-	4.8	4.2	4.4
	Max	11.0	-	10.3	15.6	14.2
	Avg.	7.8	-	7.4	9.3	9.7

** Monitoring only required for 1999 - 2001*
^ Monthly sample
"" Quarterly sample

In the fall of 2012, ECORP was contracted by Glenn Lukos Associates, Inc. to conduct a baseline aquatic habitat survey using Surface Water Ambient Monitoring Program (SWAMP) sampling protocols and including a benthic macroinvertebrate (BMI) bioassessment assessment of Pine Creek above and below its confluence with Morgan Creek. No aquatic species under the Federal Species Act and California Endangered Species Act were detected within the Project study area during the survey. Below is a table of water quality measurements in Fall 2012.

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Table 7.2.4: General Physical Habitat Characteristics and Water Quality Measurements, Fall 2012

	Fall 2012	
Sampling Information	Pine Creek	Pine Creek
	Control	Experimental
Date Sampled	9/10/2012	9/11/2012
Time Sampled	13:30	10:05
Site Length (m)	150m	150m
Specific Conductance (mS/cm)	0.03	0.07
Dissolved Oxygen (mg/L)	8.24	9.17
Water Temperature (°C)	14.35	10.64
Turbidity (NTU)	0.00	0.00
pH	9.68	9.44
Salinity (ppt)	0.00	0.00
ORP (mV)	183.00	134.00
Total Dissolved Solids (g/L)	0.02	0.05
	.	
Notable field conditions Recent Rainfall Evidence of Fires	Control	Experimental
	N	N
Dominant land use/cover	N	N
	FOREST/INDUSTRIAL	FOREST

7.2.1 Proposed Environmental Measures

Applicant proposes to prepare a Water Quality Protection Plan (WQPP) to meet state water quality standards in consultation with the SWRCB. Typical WQPPs include a stormwater pollution prevention plan, spill prevention and containment procedures, procedures for application of herbicides, pesticides, fungicides, and disinfectants, and associated water quality monitoring.

Applicant also proposes to monitor select water quality parameters such as stream flow, temperature, and turbidity at certain locations and frequencies to determine overall compliance with state water quality standards where applicable to areas influenced by Project operations.

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7.2.2 Environmental Effects of Applicant-proposed Measures

It is expected that preparation and approval by the SWRCB of the WQPP and implementation of compliance monitoring will ensure that state water quality standards are met for Project operations. If water quality issues are identified through monitoring, it is anticipated that all practicable solutions would be identified and implemented in consultation with the SWRCB and other resource management agencies.

8.0 ENVIRONMENTAL ANALYSIS OF AQUATIC RESOURCES

8.1 Affected Environment

Brook, Golden, Brown and Rainbow Trout are known to inhabit Pine Creek upstream and downstream from the Project. Brook and Golden Trout are known to occupy lakes and streams upstream from the Project. Those species are native to the area but generally reside at higher elevations. The creeks at Project site consist of steep slopes and strong currents. Fish are rarely found in the Project vicinity due to steep terrain. Downstream locations were previously stocked with Brown and Rainbow Trout on an annual basis. Due to government budgeting constraints, no stocking has occurred in recent years in Pine Creek.

The presence of fish in Pine Creek raises the issue as to whether the Project will or could adversely affect water levels in those creeks that have historically received discharged mine water as one of their sources. However, no adverse impact on fish from water discharged by the mine could occur as a result of the Project because regardless of turbine operation or non-operation, the amount of mine water discharged through the Pelton turbine will continue at naturally occurring run of the mine levels, as has historically been the case. This is because the turbine will discharge water to atmospheric pressure. Fluctuations in discharge levels due to changes in weather patterns will be minimized by the Project because of the release of stored water will occur at standard historical levels. During maintenance and repairs to the Project, water will continue to flow at standard levels into the ditch on the other end of the Project as has always been the case. Finally, water impoundment within the mine will occur at rates that do not affect historic run of the mine water discharge levels.

The discharge of water will be regulated to ensure a run of the mine release as base storage is slowly established in the mine. The powerdraft of the unit would be set to maintain the pressure and balance the inflow and outflow of waters into the mine resulting in a run of the mine release.

A pressure transducer would be installed on the supply line to the turbine or static bypass line connected to the pressurized section of the tunnel. The pressure transducer would have a direct readout as well as go to a data logger and/or controller for the unit. The Pelton impulse turbine with jet deflectors would intercept the flow of water in the event of a generator trip. The position of the turbine nozzle(s) would be set

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manually with the use of deflectors so that in the event of a unit trip the amount of water would continue to flow as previously set.

8.1.1 Special-Status Aquatic Species

Portions of the Project study area contains potentially suitable habitat for special-status amphibians, including the Yosemite Toad (Bufo canorus), Sierra Nevada Yellow-legged Frog (Rana sierrae), and the Mount Lyell Salamander (Hydromantes platycephalus). GLA biologists conducted focused amphibian surveys during all site visits (June 1 and 2, July 10 and 11, August 7, and September 24 and 25, 2012). Focused surveys for the Yosemite toad and Sierra Nevada yellow-legged frog followed accepted amphibian sampling protocols (Crump and Scott 1994, Fellers and Freel 1995, Lind 1997, Seltenrich and Pool 2002, and Thoms et al. 1997). The survey visits included both daytime and nighttime visual inspection surveys of all areas of suitable habitat including the man-made ponds and slow-moving areas of the creeks in order to search for egg masses, tadpoles, and/or adults. Where appropriate, GLA biologists sampled areas of suitable habitat using dip nets.

Surveys were concentrated within the reaches of Pine Creek and Morgan Creek, but other areas of potentially suitable habitat were considered within the overall Project study area. Focused surveys for the Mount Lyell salamander were conducted in conjunction with the Yosemite toad and yellow-legged frog within areas of Pine and Morgan Creeks and within rocky areas in close proximity to man-made pools located within the disturbed mine footprint. In addition, because salamanders have been detected in mines (P. Brown, personal communication, June 1, 2012), GLA biologists surveyed inside the mine from the portal entrances to the existing concrete plug using flashlights to scan the walls and floors of the mine.

In addition, GLA conducted a thorough literature review of sensitive amphibian locations within the vicinity of the Proposed Project from a variety of sources which include but are not limited to: (1) California Natural Diversity Database (CNDDB 2013), (2) personal communication with CDFW Fisheries Biologist James Erdman, (3) review of CDFW High Mountain Lake (HML) surveys day provided by Mr. Erdman, and (4) review of Mt. Lyell salamander location data from Chris Fichtel (October 2004), provided by Mr. Erdman. All known sensitive amphibian species locations within the vicinity of the Project were included in the surveys. No special-status amphibians were detected within the Project study area during the surveys.

Macroinvertebrates

Physical habitat data collection and benthic macroinvertebrate sampling methods conformed to SWAMP's standard targeted riffle composite (TRC) method for documenting and describing benthic macroinvertebrate assemblages within sampling sites.

Two stream reaches (sites), each measuring 150 meters in length, were selected during the Pine Creek Baseline Aquatic Habitat Monitoring Survey conducted on 10-11

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September 2012 (Figure 5.3-1). One site was established in Pine Creek upstream from its confluence with Morgan Creek and served as the reference site (control site) for the study. The control site was located slightly outside the Project area because stream flow in Pine Creek became subsurface within the Project area. The control site was therefore located upstream and slightly outside of the Project area because it was the only location in which a 150-meter sampling reach that could be located above the confluence with Morgan Creek.

A second site was established in Pine Creek downstream from the confluence with Morgan Creek and served as the potentially-affected (experimental) site for the study. This site was selected based on its proximity to the confluence with Morgan Creek and the ability of surveyors to safely work within the stream channel. Physical habitat (PHAB) characteristics at each site location were evaluated, measured, and recorded using California's State Water Resources Control Board (SWRCB) SWAMP procedures (Ode 2007).

Visual estimates of riparian vegetation, in stream habitat complexity, human influence, and bank stability were also recorded. Visual estimates of the percentage of flow habitats present were also recorded. Stream flow discharge data were collected at the downstream extent of each site. Samples were collected starting at the most downstream riffle unit and proceeding upstream to minimize in stream disturbance. A total of at least 500 BMIs were subsampled from a minimum of five grids, or five half grids.

Subsampled BMIs were identified by a taxonomist approved by the California Department of Fish and Wildlife (CDFW), (formerly California Department of Fish and Game), for U.S. Environmental Protection Agency (USEPA) evaluations using standard aquatic macroinvertebrate identification keys.

Following the data collection and sample processing, all data were subject to quality assurance/quality control (QA/QC) procedures including, but not limited to, spot-checks of data and review of electronic data for completeness.

Standard biological metrics (as outlined in Ode et al. 2005) plus any additional relevant metrics (regional IBI), were calculated for each reach and presented in graphical or tabular form. Finally, the CDFW Aquatic Bioassessment Laboratory (ABL) was contracted to perform an external QC review of the sample identification. 20%of the samples collected (or one sample, if five samples or less are collected) were randomly selected for QC by the taxonomist and sent to the CDFW ABL for taxonomic verification. The three RBP scores for this reach were in the Optimal range. Epifaunal substrate cover scored a 17 (Optimal), sediment deposition consistently scored a 19 (Optimal), and the channel alteration parameter consistently scored 19 (Optimal) (ECORP, 2013). The SoCal B-IBI score for this reach was in the 'Fair' condition category (ECORP, 2013).

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RESULTS

The following section provides an overview of the BMI results (all sampling reaches combined) obtained during the survey effort in fall 2012; general descriptions of sampling reaches including physical habitat conditions (based on fall surveys); and specific BMI results, by sampling reach, for the survey efforts.

During the fall 2012 surveys, an estimated 5,157 BMIs were collected from the two sampling sites, representing 51 distinct taxa and 11 orders. Of this total, 1,291 BMIs were identified during the sample processing effort.

Habitat and substrate characteristics for both sites are provided in Attachment A. Raw BMI data and summary metrics are presented in Attachment B. The SoCal B-IBI scores for each site are provided in Attachment C.

Control Site

The control sampling site is located on Pine Creek upstream from the Pine Creek Mine at UTM coordinates 11S 0349226 E, 4135902 N and an elevation of 7,961 ft. The downstream end of the 150-m sampling site is located approximately 520 m upstream from its confluence with Morgan Creek. The control site is within a high gradient mountain creek with a slope of 19.56%, with an average streamflow of 2.9 cubic feet per second (cfs). Water temperature was 14.35 degrees Celsius (°C), dissolved oxygen was 8.24 milligrams per liter (mg/L), and pH was 9.68 within the site (Table 1). Cascades/falls and riffles were the primary instream habitats with substrates dominated by cobble and both small and large boulders. Bankfull widths ranged from 3.8 to 9.2 m, with both stable and vulnerable banks. Stream depths ranged from near zero to 110 centimeters (cm). Canopy cover was intermediate with an average of 34.1% and consisted primarily of water birch riparian scrub with minimal deposits of coarse particulate organic matter (CPOM) in the stream channel. Riparian vegetation consisted of miner's dogwood (Cornus sp.), mountain dogwood (Cornus sp.), mountain alder (Alnus sp.), water birch (Betula sp.), California buckeye (Aesculus sp.), buckthorn (Rhamnus sp.), and slippery elm (Ulmus sp.). Emergent vegetation was absent throughout the reach. Human influence within and adjacent to the reach was evident by the trash and landfill present, along with a bridge that extends over the reach. The surrounding land use was forest and mining.

The three RBP scores for this reach were in the Optimal range. Epifaunal substrate cover scored a 17 (Optimal), sediment deposition consistently scored a 19 (Optimal), and the channel alteration parameter consistently scored 19 (Optimal) (see Attachment A). The SoCal B-IBI score for this reach was in the 'Fair' condition category (see Attachment B, Figure 3).

Community metrics indicated a balanced benthic community, as indicated by the Shannon Diversity Index (SDI) (see Attachment B, Figure 4). The stonefly, Zapada cinctipes dominated the benthic community, comprising 15% of the community (see Attachment B, Figure 5). The Tolerance Value (2.7) was lower than that observed for

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the experimental site (see Attachment B, Figure 6). Intolerant Organisms accounted for 56% of the community (see Attachment B, Figure 7). The high number of Intolerant Organisms directly affected the Tolerance Value.

Correspondingly, Tolerant Organisms comprised 3.5% of the community. Additionally, EPT and Sensitive EPT indices exceeded 60% of the community (see Attachment B, Figure 8).

Table 1. General Physical Habitat Characteristics and Water Quality Measurements, Fall 2012

	Fall 2012	
	Pine Creek	Pine Creek
Sampling Information	Control	Experimental
Date Sampled	9/10/2012	9/11/2012
Time Sampled	13:30	10:05
Site Length (m)	150m	150m
Specific Conductance (mS/cm)	0.03	0.07
Dissolved Oxygen (mg/L)	8.24	9.17
Water Temperature (°C)	14.35	10.64
Turbidity (NTU)	0.00	0.00
pH	9.68	9.44
Salinity (ppt)	0.00	0.00
ORP (mV)	183.00	134.00
Total Dissolved Solids (g/L)	0.02	0.05
Notable field conditions	Control	Experimental
Recent Rainfall	N	N
Evidence of Fires	N	N
Dominant landuse/cover	FOREST/INDUSTRIAL	FOREST

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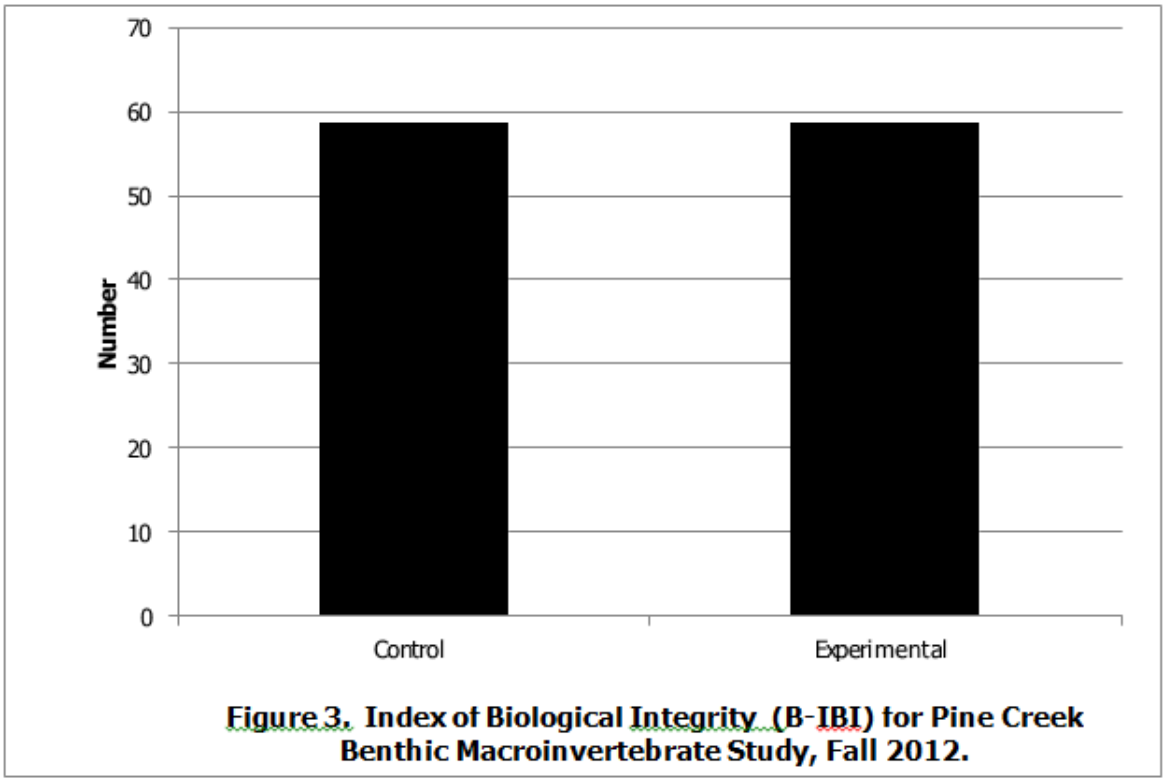

Figure 3. Index of Biological Integrity (B-IBI) for Pine Creek Benthic Macroinvertebrate Study, Fall 2012.

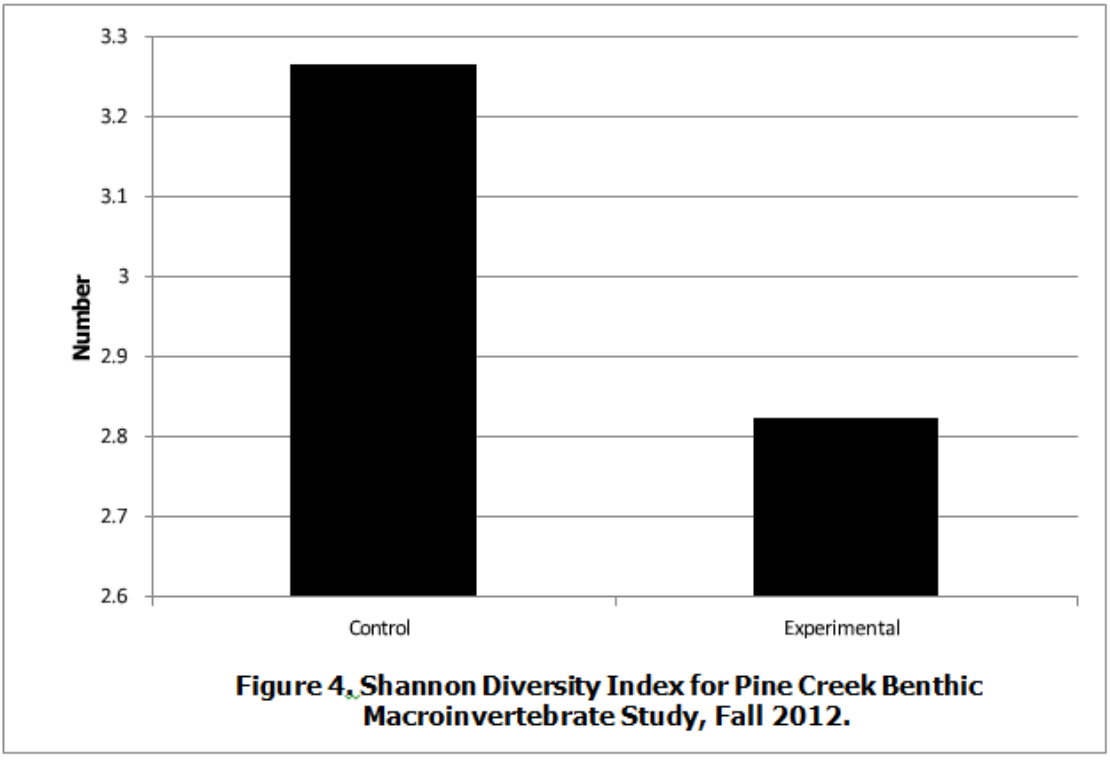

Figure 4. Shannon Diversity Index for Pine Creek Benthic Macroinvertebrate Study, Fall 2012.

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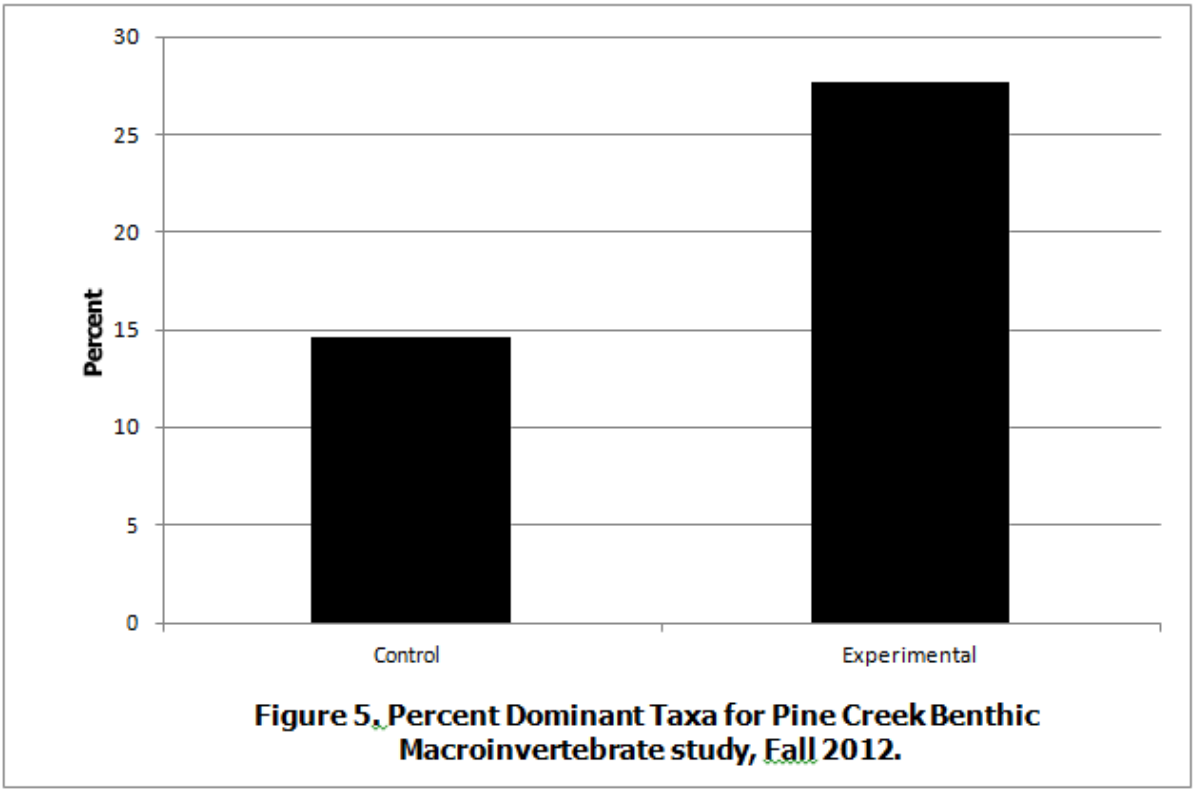

Figure 5. Percent Dominant Taxa for Pine Creek Benthic Macroinvertebrate study, Fall 2012.

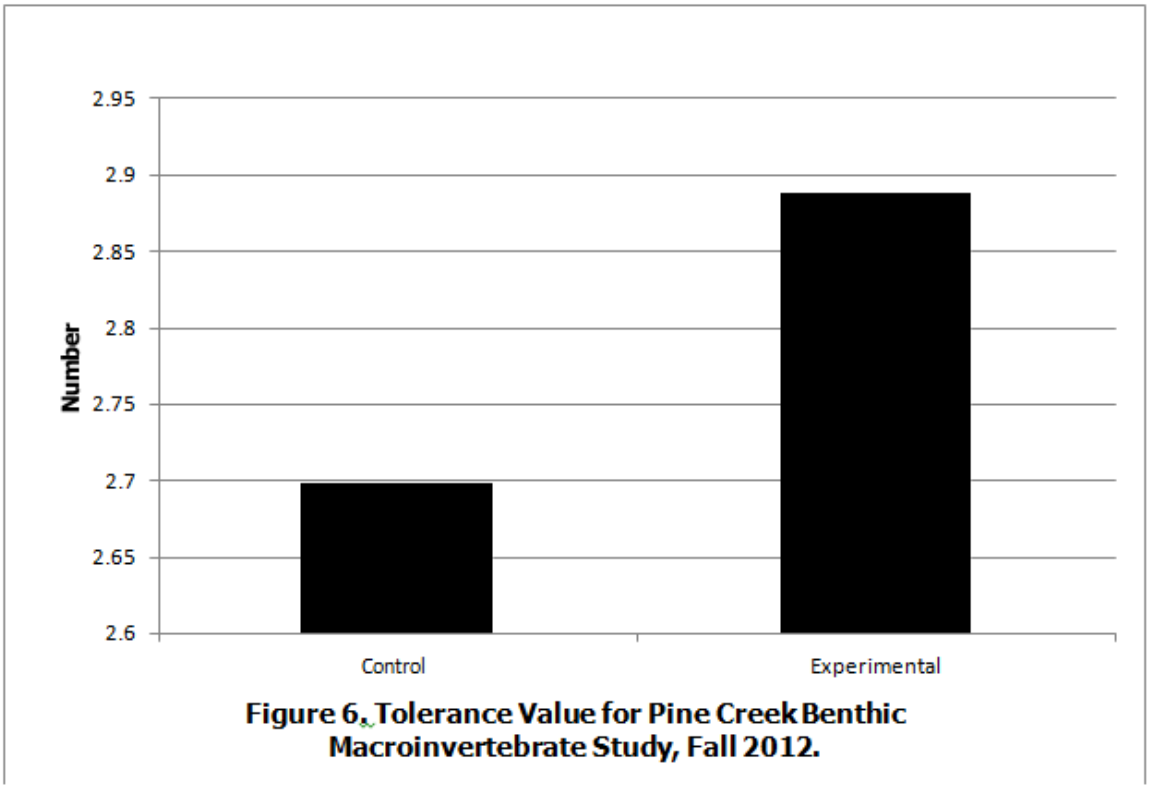

Figure 6. Tolerance Value for Pine Creek Benthic Macroinvertebrate Study, Fall 2012.

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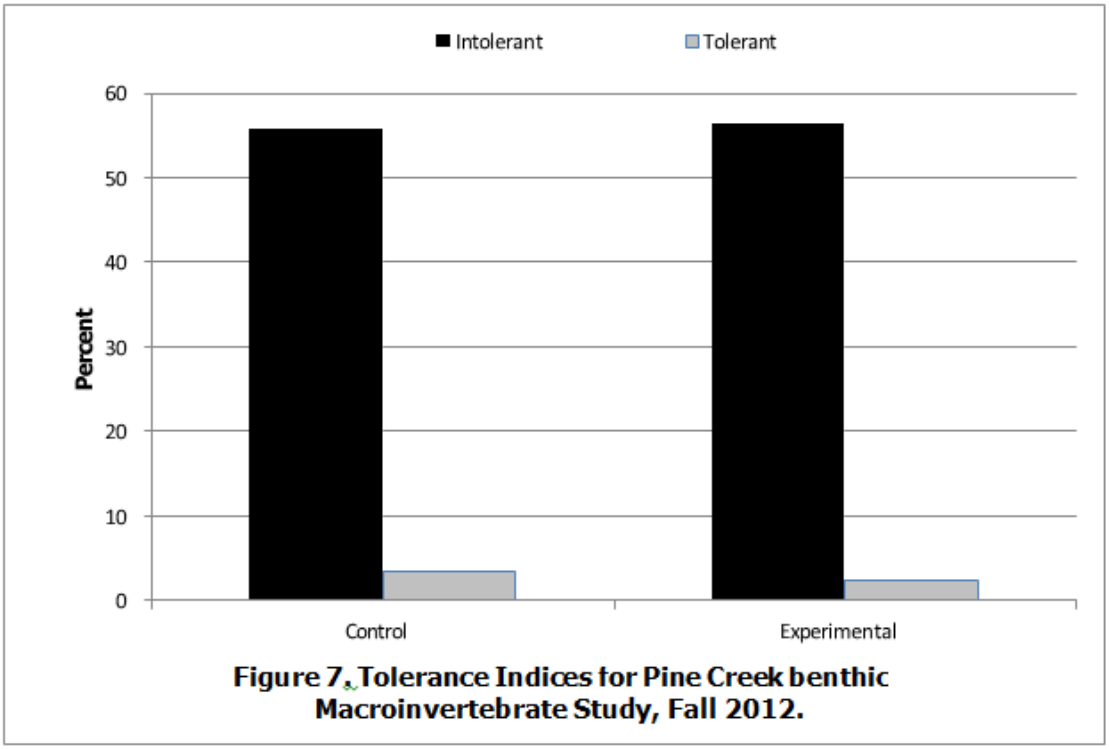

Figure 7. Tolerance Indices for Pine Creek benthic Macroinvertebrate Study, Fall 2012.

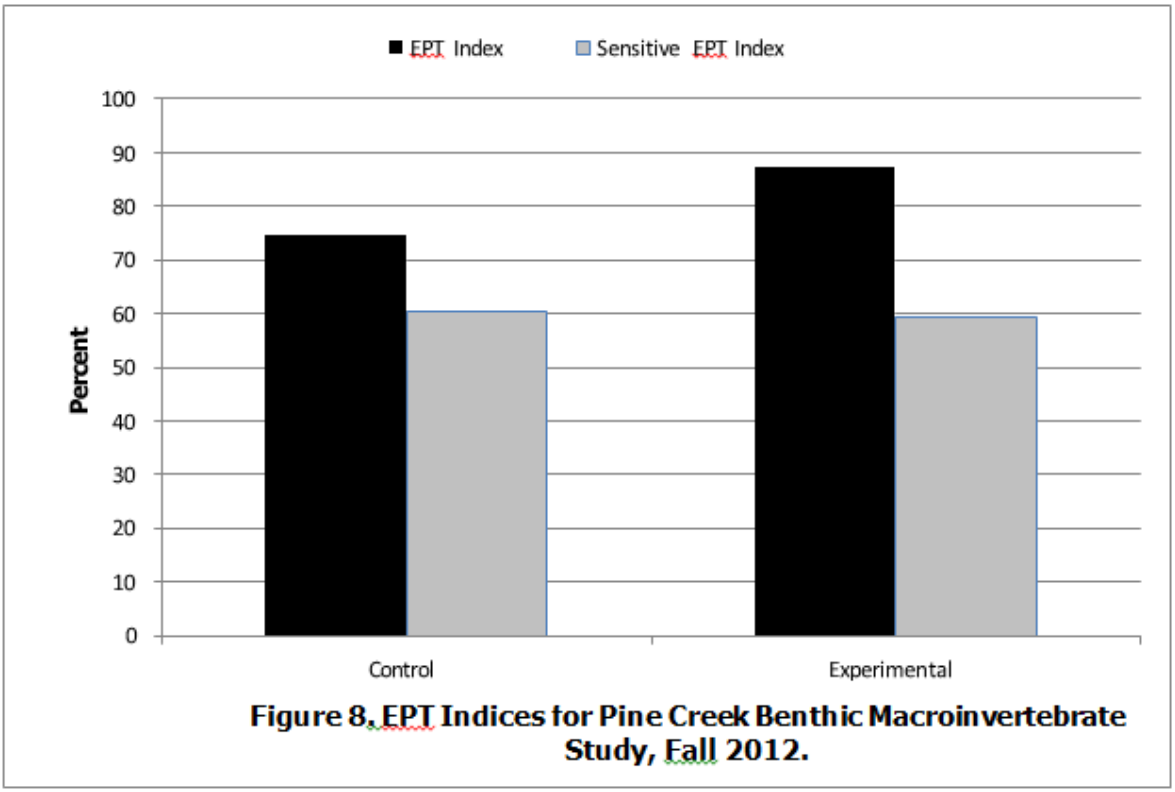

Figure 8. EPT Indices for Pine Creek Benthic Macroinvertebrate Study, Fall 2012.

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Functional Feeding Group metrics indicated that the community was co-dominated by three feeding groups; Predators, Collector-gatherers, and Shredders exceed 20% of the community (see Attachment B, Figure 9). Additionally, Scrapers comprised about 20% of the community.

Experimental Site

The experimental sampling site is located on Pine Creek downstream from the Pine Creek Mine at UTM coordinates 11S 0350045 E, 4136395 N and an elevation of 7,475 ft. The upstream end of the 150-m sampling site is located approximately 370 m downstream from its confluence with Morgan Creek. The experimental sampling site is within a high gradient mountain creek with a slope of 11.73% and an average streamflow of 17.7 cfs. Water temperature was 10.64 °C, dissolved oxygen was 9.17 mg/L, and pH was 9.44 within the site (Table 1). Rapids was the primary instream habitat type with substrates dominated by cobble and both small and large boulders (Attachment A). Bankfull widths ranged from 4.2 to 6.6 m, with both stable and vulnerable banks present. Stream depths ranged from near zero to 110 cm. Canopy cover was dense and averaged 75.3%. The riparian corridor consisted primarily of water birch riparian scrub, which included elderberry (Sambucus sp.), box elder (Acer sp.), mountain maple (Acer sp.), and ash (Fraxinus sp.), with minimal deposits of CPOM in the stream channel. Emergent vegetation was sparse throughout the reach. Human influence within and adjacent to the reach was evident by the trash present. The surrounding land use was forest.

The three Rapid Bioassessment Protocol (RBP) scores for this reach were in the Optimal range. Epifaunal substrate cover scored a 19 (Optimal), sediment deposition consistently scored a 19 (Optimal), and the channel alteration parameter consistently scored 19 (Optimal) (see Attachment A). The SoCal B-IBI score for this reach was in the ‘Fair’ condition category (see Attachment B, Figure 3).

Community metrics indicate that the benthic community was relatively balanced, as evidenced by the Shannon Diversity Index (SDI) (see Attachment B, Figure 4). The stonefly, Zapada cinctipes dominated the benthic community, comprising 28% of the community (see Attachment B, Figure 5). The mayfly, Beatis sp. comprised 17% of the community and was the second most abundant organism at this site. The Tolerance Value was slightly higher than was observed at the reference site, however, both scored less than 3.0 (see Attachment B, Figure 6). Intolerant Organisms accounted for 56% of the community (see Attachment B, Figure 7). The high number of Intolerant organisms directly affected the Tolerance Value. Correspondingly, Tolerant Organisms comprised 2.5% of the community. Additionally, the EPT Index exceeded 85% and Sensitive EPT Index exceeded 59% of the community (see Attachment B, Figure 8).

Functional Feeding Group metrics indicated that the community was dominated by the three groups; Collector-gatherers, Shredders and Predators. The Collector-gatherers and Shredders each comprised greater than 30% of the community (see Attachment B, Figure 9). Scrapers comprised about 8% of the community.

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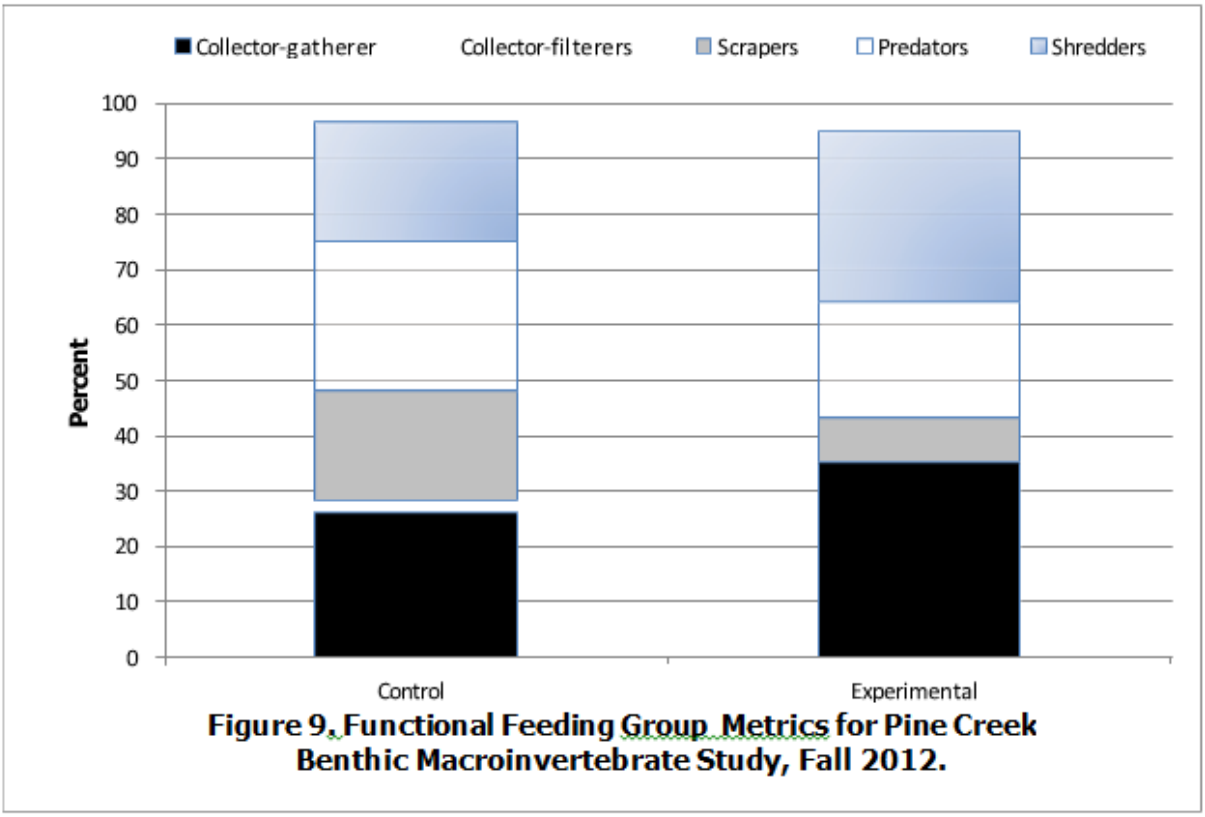

Figure 9. Functional Feeding Group Metrics for Pine Creek Benthic Macroinvertebrate Study, Fall 2012.

The experimental site was randomly selected for external QC of taxa identification and counts by the CDFW ABL in Chico. The external QC found only minor discrepancies in the counts of six taxa. There was only one instance where the original ID was disputed by the ABL, and five instances where the original ID was placed at a different taxonomic level.

DISCUSSION

Results from the BMI bioassessment surveys indicated the sites were relatively similar, based upon IBI scores. However, streamflow at the experimental site was approximately six times the flow at the control site, due to a tributary entering Pine Creek between the two sites. Riparian canopy at the experimental site was also about twice that observed at the control site. However, the slope was much higher at the control site. Taxa Richness was higher at the control site as was the Shannon Diversity Index, indicating the control site had a more balanced community compared to the experimental site. Tolerance values were similar between sites, as were percent Intolerant and Tolerant organisms. The control site had a lower EPT Index, however the Sensitive EPT values were similar between sites, with a difference of only 1%. Mayfly and trichoptera taxa were more abundant at the control site, while the experimental site had more stonefly taxa. Abundance estimates were higher at the experimental site.

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Substrate composition varied between the two sites; bedrock abundance at the control site was twice that observed at the experimental site. Larger substrates (boulder/bedrock) were more abundant (10%) at the control site and preferred BMI substrates (gravel/cobble) were more abundant (10%) at the experimental site. Habitat composition differed between the two reaches with cascades/falls comprising four times the habitat at the control site. Rapids comprised more than two times the habitat at the experimental site than that observed at the control site.

The following discussion provides an assessment and comparison of the BMI communities present at the control site relative to the communities at the experimental site.

Control Site

The SoCal B-IBI for the control site also scored in the 'Fair' range, indicating a degree of similarity between the two sites. However, the SDI at the control reach was higher than observed at the experimental site. This higher score indicates a relatively more balanced community than observed at the experimental site. Taxa richness also scored higher at this site. The EPT Indices exceeded 60% of the community at this site and many of these organisms were 'sensitive' to pollution. The benthic community was more evenly distributed as described by the Functional Feeding Groups. Four feeding group metrics were about 20% or more of the community, with only a minor percentage of Collector-filterers comprising the community. Predators, Collector-gatherers, Shredders, and then Scrapers were the four most abundant groups in the community, compared to three of these at the experimental site. The Tolerance Value was also lower at this site.

The control site also had a much higher percentage of large substrate types than observed at the experimental site. However, gravels and cobbles still comprised 40% of the substrate, which are favorable habitat for EPT taxa. Fines were a minor component of the substrate and probably had little effect on the benthic communities at this site. One of the biggest differences between the sites was the riparian canopy cover, which was half as abundant at this site compared to the experimental site.

Experimental Site

The SoCal B-IBI score for the experimental site was in the 'Fair' category. In addition to the reach location, substrates in the reach were dominated by cobble and small boulder with little fine substrates. Substrates of cobble, small boulder and coarse gravels are a stable base and preferred substrates for benthic macroinvertebrate communities, especially the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT Taxa) (Hines 1970). The EPT Taxa are sensitive to most types of water pollution, and the number of individuals in these groups decline with decreasing water quality, as does Taxa Richness (Reice and Wohlenberg 2001). However, the EPT taxa were the most abundant organisms in this reach. The dominant taxa was Zapada cinctipes, an intolerant stonefly which is sensitive to pollution. The mayfly Baetis sp., was the second most dominant taxa, however Baetis sp. is not considered a sensitive organism. This

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reach also had more stonefly taxa than observed in the control reach, and many of the genera observed were also intolerant species. This reach was also dominated by three of the Functional Feeding Group metrics, Percent Collector-gatherers, Shredders and Predators with a few Scrapers. No Collector-filterers were collected in this reach. The SDI was lowest at this site, but indicated a fairly balanced community. Nonetheless, the two sites both appear to be in good condition as determined by the BMI metrics and B-IBI scores.

LIST OF ATTACHMENTS

Attachment A – Physical Habitat and Substrate Characteristics, Fall 2012

Attachment B – Raw BMI Data and Summary Metrics

Attachment C – SoCal B-IBI Scores

See Attachment A On Next Page

Attachment A. Physical Habitat and Substrate Characteristics, Fall 2012

Habitat Composition

	Cascade/ Falls	Rapid	Riffle	Run	Glide	Pool	Dry	Total
Control	28	16.5	27	12.5	12	3.5	0.5	100
Experimental	7	42.5	22.5	18	6.5	3.5	0	100

Substrate Composition

	Wood	Sand	Gravel Fine	Gravel Coarse	Cobble	Small Boulder	Large Boulder	Bedrock Rough	Bedrock Smooth	Total
Control	1.0	4.8	9.5	10.5	20.0	22.9	20.0	11.4	0.0	100.0
Experimental	1.9	3.8	5.7	13.3	31.4	23.8	16.2	1.0	2.9	100.0

Embeddedness

	Control	Experimental
Average	37.6	34.8

Canopy Cover

	Control	Experimental
Average	34.1	75.3

Creek Flow

	Control	Experimental
Average	2.9	17.7

Additional Habitat Characterization

	Control	Experimental
Epifaunal Substrate/ Cover	17	19
Sediment Deposition	19	19
Channel Alteration	19	19

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Attachment A. Physical Habitat and Substrate Characteristics.

Pine Creek BMI Data 2012

	CTV	FFG	Pine Creek Control 6275.1-1	Pine Creek Experimental 6275.1-2
PHYLUM ARTHROPODA				
Class Insecta				
Coleoptera (Larvae)				
Elmidae	4	cg		1
Diptera				
Chironomidae	6			
Tanytarsini	6	cg		
Microspecta sp.	7	cg	4	5
Rheotanytarsus sp.	6	cf	1	
Diamesinae	2	cg		
Diamesini				
Diamesa sp.	5	cg	1	
Orthocladiinae	5	cg		
Brillia sp.	5	sh	15	4
Chaetocladius sp.	6	cg		2
Cricotopus sp.	7	cg		2
Eukiefferiella devonica gr.		om	4	4
Eukiefferiella gracei gr.		om	2	
Orthocladius sp.	6	cg		1
Orthocladius (Symp.) lignicola			1	
Orthocladius complex			2	2
Paraphaenocladius 'n. sp.'			1	
Parorthocladius sp.				1
Rheocricotopus sp.	6	om	3	1
Tvetenia bavarica grp.	5	cg	15	3
Dixidae	2	cg		
Dixa sp.	2	cg	1	
Empididae	6	p	3	2
Chelifera /Metachela sp.	6	p	22	5
Clinocera sp.	6	p	1	
Wiedemannia sp.	6	p	20	9
Simuliidae	6	cf		
Simulium sp.	6	cf	4	
Thaumaleidae		sc	1	
Thaumalea sp.		sc		
Tipulidae	3		1	
Dicranota sp.	3	p	2	
Megaloptera				
Corydalidae	0	p		
Orohermes crepusculus	0	p	3	2
Ephemeroptera				
Baetidae	4	cg		
Baetis sp.	5	cg	75	112
Baetis tricaudatus	6	cg	8	51
Ephemerellidae	1	cg		
Caudatella sp.	1	cg	9	4
Caudatella hystrix	1	cg	11	1
Drunella doddsi	0	cg	20	26
Drunella spinifera	0	p	6	1
Heptageniidae	4	sc	1	
Epeorus sp.	0	sc	90	27
Ironodes sp.	3	sc	34	21
Rhithrogena sp.	0	sc	2	3
Leptophlebidae	2	cg	5	
Plecoptera				
Chloroperlidae	1	p	12	22
Nemouridae	2	sh	19	4
Malenka sp.	2	sh		1
Zapada cinctipes	2	sh	95	177
Zapada columbina	2	sh	7	2
Peltoperlidae	1	sh		1
Yoraperla sp.	1	sh		9
Perlidae	1	p	9	2
Calineuria californica	2	p	2	

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Attachment B – Raw BMI Data and Summary Metrics

Attachment B-Pine Creek BMI Data and Summary Metrics

	CTV	FFG	Pine Creek Control	Pine Creek Experimental
Doroneuria baumanni	1	p	4	3
Hesperoperla sp.	2	p		11
Hesperoperla hoguei	2	p		3
Perlodidae	2	p	1	1
Frisonia picticeps	2	p	9	26
Pteronarcyidae	0	om		
Pteronarcella sp.	0	om		1
Trichoptera				1
Hydropsychidae	4	cf		
Arctopsychinae			6	14
Arctopsyche sp.	1	p		5
Arctopsyche californica	1	p	1	4
Parapsyche sp.	0	p	9	6
Hydroptilidae	4	ph		
Nothotrichia shasta	4	ph	1	
Lepidostomatidae	1	sh		
Lepidostoma sp.	1	sh	4	
Philopotamidae	3	cf		
Dolophilodes sp.	2	cf	8	
Rhyacophilidae	0	p		
Rhyacophila sp.	0	p	5	5
Rhyacophila betteni gr.	0	p	4	
Rhyacophila brunnea gr.	0	p	24	10
Rhyacophila hyalinata gr.	0	p		2
Rhyacophila vofixa gr.	0	p	1	
Uenoidae	0	sc	1	
Oligophlebodes sp.	0	cg		2
Subphylum Chelicerata				
Class Arachnoidea				
Acari				
Hygrobatidae	5	p		
Hygrobates sp.	8	p	2	
Hydrovolziidae				
Lebertiidae	5	p		
Lebertia sp.	8	p	2	2
Sperchontidae	5	p	1	1
Sperchon sp.	8	p	11	3
Sperchonopsis sp.	8	p	6	8
Torrenticolidae	5	p		
Testudacarus sp.	5	p	4	1
Torrenticola sp.	5	p	12	
Subphylum Crustacea				
Class Ostracoda				
Ostracoda	8	c		3
Cyprididae	8	c		
PHYLUM MOLLUSCA				
Class Bivalvia				
Pelecypoda	8	cf		
Sphaeriidae	8	cf	1	
PHYLUM PLATYHELMINTHES				
Class Turbellaria			1	6
Class Oligochaeta	5	cg	20	15

Attachment B – Raw BMI Data and Summary Metrics (Continued)

Pine Creek Summary Metrics, Fall 2012

	Control	Experimental
B-IBI	58.6	58.6
Abundance	2080	3077
Taxa Richness	62	55
Dominant Taxon	14.6	27.6
EPT Taxa	31	32
EPT Index	74.3	87.1
Sensitive EPT Index	60.3	59.3
Ephemeroptera Taxa	11	9
Plecoptera Taxa	9	14
Trichoptera Taxa	11	8
Dipteran Taxa	20	13
Percent Dipteran	16.0	6.4
Non-Insect Taxa	10	8
Percent Non-Insect	9.2	6.1
Percent Chironomidae	7.5	3.9
Percent Hydropsychidae	2.5	4.5
Percent Baetidae	12.8	25.4
Shannon Diversity	3.27	2.82
Tolerance Value	2.7	2.9
Intolerant	55.7	56.3
Tolerant	3.4	2.5
Collector-gatherer	26.0	35.1
Collector-filterers	2.2	0.0
Scrapers	19.8	8.0
Predators	27.1	20.9
Shredders	21.5	30.9
OTHER	1.5	0.9
Piercer herbivore	0.2	0.0
Macrophyte herbivore	0.0	0.0
Omnivore	1.4	0.9
Xylophage	0.0	0.0

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Attachment C – SoCal B-IBI Scores

8.1.2 Aquatic Species Listed under the Federal Endangered Species Act and California Endangered Species Act and Fully Protected Species

No aquatic species under the Federal Species Act and California Endangered Species Act aquatic species were detected within the Project study area during the surveys.

8.2 Project Effects on Aquatic Resources

Construction will occur over a relatively short six-week period of time and occur substantially underground or within the previously disturbed mill site and staging areas. Construction accessed will be by graded maintenance roads which already exist. Pine Creek's proposal is not likely to adversely affect individuals, populations, or habitat of any special-status species dependent on water or aquatic resources.

8.2.1 Proposed Environmental Measures

No environmental measures directly relating to aquatic resources are proposed by any resource agency or interested party. In fact, a macroinvertebrate study completed in 2013 concluded that the mine water discharge has a beneficial effect on aquatic resources due to the relatively consistent water temperature. It creates a cooling of creek water during the summer and a warming of creek waters in the winter months, all resulting in a more hospitable habitat for the aquatic wildlife. ECORP 2013.

8.2.2 Environmental Effects of Applicant-proposed Measures

No environmental measures have been recommended or are proposed.

9.0 ENVIRONMENTAL ANALYSIS OF TERRESTRIAL RESOURCES

9.1 Affected Environment

9.1.1 Species Listed under the Federal Endangered Species Act and California Endangered Species Act, Fully Protected Species and Birds of Conservation Concern

Where existing, relevant and reasonably available information from Pine Creek's PAD was not sufficient to determine the potential effects of the Project on terrestrial

resources with respect to threatened, endangered and special-status species, Pine Creek conducted three studies: (1) Special-Status Wildlife Assessment including a bat assessment; (2) Special Status Plant Assessment; and (3) Aquatic Macroinvertebrates. The studies are complete and technical memoranda providing the study results were filed to FERC with the Initial Study Report (Pine Creek 2013) on March 31, 2013.

GLA determined special-status species known or with the potential to occur within the FERC Project Boundary by conducting an extensive review of relevant species accounts and consulting with government agencies. For the purpose of this License, categories defined as special- status include species:

- Listed under the ESA as endangered (FE) or threatened (FT), a candidate for listing, or proposed for delisting (USFWS 2010a)
- Listed under the CESA, as Endangered (SE), Threatened (ST), of fully protected (FP) (CDFG 2011a)
- Listed by the United States Fish and Wildlife Service (USFWS) as a Bird of Conservation Concern (BCC) (CDFG 2011a)
- For wildlife, listed by the California Department of Fish and Game (CDFG) as a California Species of Special Concern (CDFG 2011a)
- For plants, found on the California Native Plant Society (CNPS) Inventory of Rare Plants, including species that are rated as CNPS 1A through 4B (CNPS 2010)
- For plants, found on CDFG's list of state-listed rare or a state candidate species under the Native Species Plant Protection Act of 1977 (CDFG 2010a)

In order to determine inclusion or exclusion of threatened, endangered and special-status species, GLA reviewed the following sources of information:

- California Invasive Plant Council Online Database. Retrieved from www.cal-ipc.org.
- California Native Plant Society. 2010. California Native Plant Society Online Inventory of Rare and Endangered Plants of California (Eight Edition California Wildlife Habitat Relationships (CWHR) Version 8.2 software (CDFG 2010b)
- California Natural Diversity Data Base (CNDDB) for the USGS Mount Tom 7.5-minute quadrangle map (CNDDB 2013)

9.1.2 Special-Status Plants

GLA reviewed the Project to identify areas with the potential to support special-status plants, including habitats and other physical features that may support special-status plants. If noxious weeds were encountered, they would be mapped using GPS. No special-status plants were detected within the Project study area. Table 9.1.1 lists the special-status plant species potentially occurring in the Project Area.

Table 9.1.1. Special-status plant species potentially occurring in the Project Area.

Species	Status	Habitat
Astragalus monoensis Mono milk-vetch	Federal: None State: None CNPS: List 1B.2	Pumice (gravelly or sandy) in Great Basin scrub and upper montane coniferous forest.
Astragalus ravenii Raven's milk-vetch	Federal: None State: None CNPS: List 1B.3	Gravelly soils in alpine boulder and rock fields, and upper montane coniferous forest.
Carex scirpoidea ssp. pseudoscirpodea Western single-spiked sedge	Federal: None State: None CNPS: List 2.2	Mesic (often carbonate) soils in alpine boulder and rock fields, meadows and seeps, andsubalpine coniferous forest (rocky).
Draba sierrae Sierra draba	Federal: None State: None CNPS: List 1B.3	Granitic or carbonate soils in alpine boulder and rock fields.
Lupin us padre-Crowley Father Crowley's lupine	Federal: None State: None CNPS: List I B.2	Decomposed granitic soils in Great Basin scrub, riparian forest, riparian scrub, and upper montane coniferous forest.

9.1.3 Noxious Weeds

During the vegetation mapping and focused survey for special-status plants, GLA noted all incidental observations of noxious weeds within the Project study area. In general, noxious weeds are not abundant within the Project study area and are primarily found along the access road to the north. One noxious weed, woolly

mullein (Verbascum thapsus), was observed in three locations along the northern access road. This species is listed as an invasive plant by the California Invasive Plant Council Exhibit (Cal-IPC) with a "Limited" inventory rating. Species with a "Limited" inventory rating are invasive but have ecological impacts that are minor on a statewide level or those where not enough information was available to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness.

Ecological amplitude and distribution are generally limited, but this species may be locally persistent and problematic. According to Cal-IPC, woolly mullein is a biennial or annual forb (family Scrophulariaceae) that occurs throughout California, but is particularly abundant in dry valleys on the eastern side of the Sierra Nevada. High population densities have been observed in moist meadows and creek drainages near Mono Lake and Owens Valley.

9.1.4 Wildlife Species Listed under the Federal Endangered Species Act, California Endangered Species Act, Fully Protected Species and Birds of Conservation Concern

The Final Revised Proposed Study of Special Status Wildlife states that operation and maintenance of the Project may have a significant, measurable adverse effect on special-status wildlife, and that the effect may be direct, indirect or cumulative. The biological surveys on an approved list of target wildlife species included the Sierra Nevada Bighorn Sheep (Ovis canadensis sierra), special-status bats, special-status salamanders, and the Yosemite Toad (Bufo canorus). SNBS are known inhabit the Project area. In June 2016, after consultation with the California Department of Fish and Wildlife, Applicant has determined that no known protected bird species nest sites exist in the immediate project area that could be potentially disturbed by project related activities. No special-status wildlife was detected within the Project study area during the surveys.

Sierra Nevada Bighorn Sheep

The Project is located within the U.S. Fish and Wildlife Service (USFWS)-designated Critical Habitat for the SNBS and SNBS have been detected within the Project area.

SNBS Background Information

The SNBS is one of three distinct subspecies of bighorn sheep and has the most restricted range and fewest individuals of the three. SNBS occur only in the Sierra Nevada Mountain Range.

Historically, SNBS were distributed along the crest of the Sierra Nevada mountain range in California, from the Sonora Pass in the north, to Olancha Peak in the south (CDFW 2012).

Presently, SNBS inhabit portions of the Sierra Nevada Mountain Range located along the eastern boundary of California in Fresno, Inyo, Mono, Tulare, and Tuolumne Counties (USFWS 2008). Habitat occurs from the eastern base of the Sierra Nevada mountain range as low as 1,460 meters (4,790 feet) to peaks above 4,300 meters (14,100 feet). SNBS use low-elevation ranges extensively in winter and early spring, alpine ranges in summer and fall, and some intermediate ranges during transition periods (Wehausen 1980). SNBS inhabit open areas where the land is rocky, sparsely vegetated, and characterized by steep slopes and canyons (Wehausen 1980).

According to the USFWS, the three primary constituent elements (PCEs) that are essential to the conservation of the SNBS include: (1) non-forested habitats or forest openings within the Sierra Nevada from 1,219 meters (4,000 feet) to 4,420 meters (14,500 feet) in elevation with steep (greater than or equal to 60 percent slope), rocky slopes that provide for foraging, mating, lambing, predator avoidance, and bedding and that allow for seasonal elevational movements between these areas; (2) presence of a variety of forage plants as indicated by the presence of grasses (e.g., Achnanthera spp.; Elymus spp.) and browse (e.g., Ribes spp.; Artemisia spp., Purshia spp.) in winter, and grasses, browse, sedges (e.g., Carex spp.) and forbs (e.g., Eriogonum spp.) in summer; and (3) presence of granite outcroppings containing minerals such as sodium, calcium, iron, and phosphorus that could be used as mineral licks in order to meet nutritional needs.

SNBS horn sheep numbers were estimated to be over 1,000 individuals prior to European settlement (CDFW 2012). However, in the 19th and 20th centuries, the bighorn population in the Sierras was severely reduced as a result from respiratory diseases from domestic sheep, forage competition with domestic livestock, and market hunting (CDFW 2012). By the late 1970's, the bighorn sheep population was reduced to approximately 250 individuals and occurred only in the vicinity of Mt. Baxter and Mt. Williamson (CDFW 2012).

The California Department of Fish and Wildlife (CDFW) began re-introducing the SNBS throughout its historic range (beginning in Wheeler Ridge, Mt. Langley, and Mono Basin) between 1979 and 1988. However, the bighorn population continued to decline to a low of approximately 100 individuals by 1995 from a combination of drought and mountain lion predation (CDFW 2012). As a result of the declining population, the SNBS was initially listed under the California Endangered Species Act (CESA) in 1974 as threatened and subsequently listed as endangered in 1999. The USFWS temporarily listed the SNBS as endangered in 1999 under the Federal Endangered Species Act (FESA). Final listing as endangered occurred in 2000.

CDFW was identified as the lead agency to implement the recovery of the SNBS. The USFWS issued the Final Recovery Plan for SNBS on September 24, 2007 (USFWS 2007). The Recovery Plan identified 16 historic Herd Units (populations) that were further classified into four Recovery Units (metapopulations). In order to down list the SNBS from the ESA, the recovery plan calls for a minimum of 305 females to be distributed among the four recovery units and for 12 of the 16 historic herd units to be occupied. This condition must persist for seven consecutive years.

Critical habitat for the SNBS was designated by the USFWS on August 5, 2008 and the Project is located within the Wheeler Ridge Unit, which is part of the Central Recovery Unit. Between 1999 and 2011, the SNBS population of this unit has increased from just over 100 animals to approximately 400 (CDFW 2012). Of the 12 Herd Units required for recovery (USFWS 2007), four units remain vacant as of 2011 (CDFW 2012).

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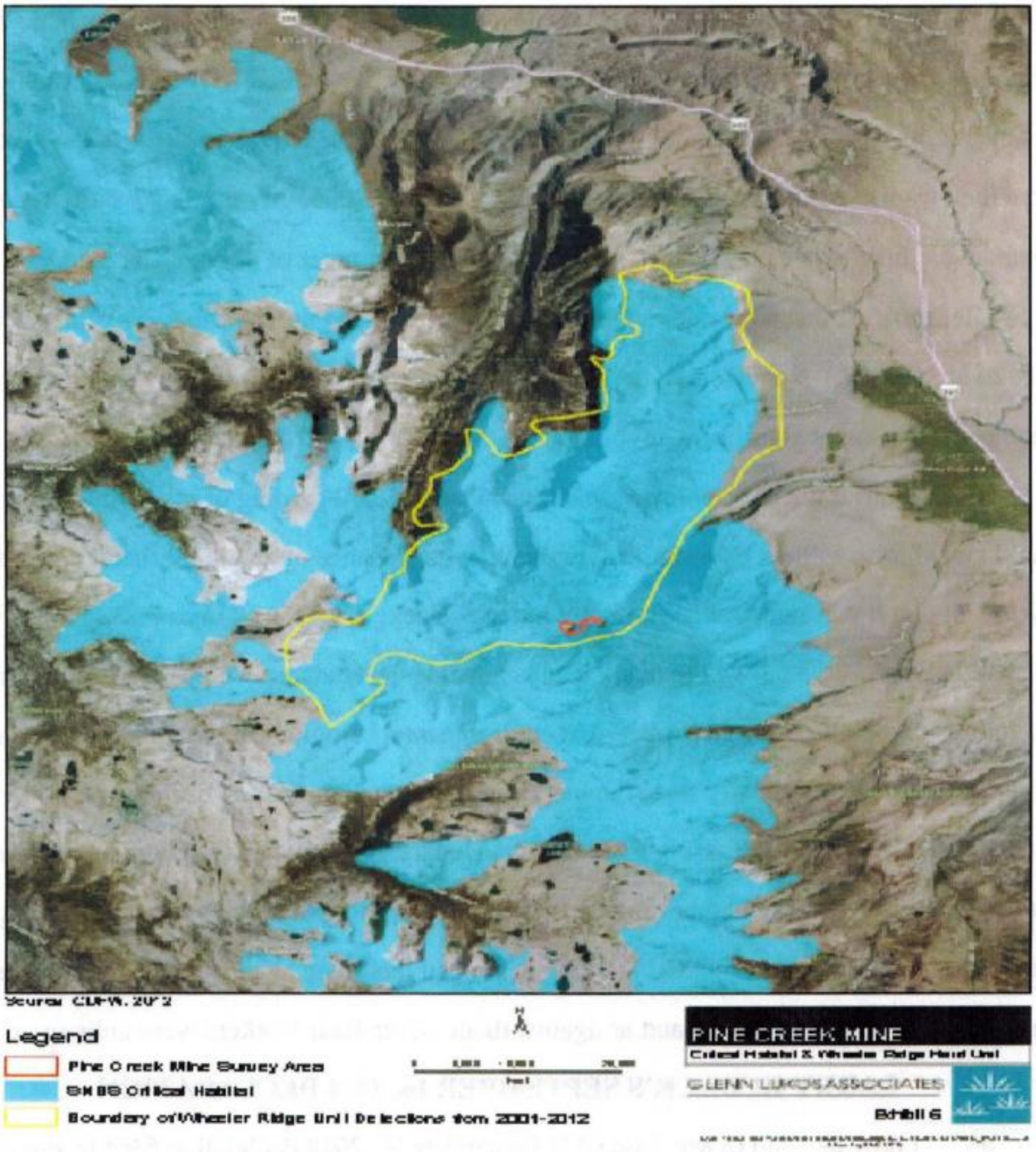

Figure 9.1.1: SNBS Critical Habitat Map

Project Study Methodology

CDFW has monitored the SNBS Wheeler Unit continuously (beginning in 1979 with the reintroduction of SNBS), using a variety of methods including radio telemetry (VHF), GPS collars, and ground observations. Based on CDFW's thorough monitoring of the SNBS, and because the SNBS has been documented within and immediately adjacent to the Project area, GLA did not conduct focused surveys for the SNBS. Instead, GLA conducted a thorough literature review of the Wheeler Ridge Unit from a variety of sources which include but are not limited to: (1) California Natural Diversity Database (CNDDB 2013), (2) Final Rule Listing the SNBS as Endangered, (3) Designation of Critical Habitat for the SNBS (USFWS 2008), (4) SNBS Final Recovery Plan (USFWS 2007), (5) quarterly and semi-annual population monitoring and other relevant reports from the CDFW Sierra Nevada Bighorn Sheep Recovery Program Literature portal (http://www.dfg.ca.gov/snbs/Literature.html), (6) personal communication with CDFW Wildlife Biologist Alexandra Few and CDFW Geographic Information Systems (GIS) Specialist Kathleen Knox from the CDFW Bishop Field Office, and (7) personal communication with Pine Creek Mine on-site property manager Tom Haenni.

GLA obtained all available data from CDFW, including VHF, Global Positioning System (GPS) and ground observation data for the SNBS Wheeler Ridge Unit obtained from 2001 through July 2012. Depending on the model of GPS collar used (e.g., ATS, Lotek, Northstar, Tellus), some collars are programmed to record detections (i.e., locations) from one to three or more times a day (K. Knox, personal communication, November 15, 2012). It should also be noted that a detection point does not identify the number of sheep accompanying the collared individual.

Because SNBS are gregarious, it can be inferred that a detection point generally indicates the location of more than one animal. GLA incorporated all SNBS location information obtained from CDFW for GIS analysis. CDFW also provided GLA with the most current information on SNBS lambing locations, and population and demography structure for the Wheeler Ridge Herd Unit, for which Exhibits 6 and 9 are derived.

In addition to the literature review, GLA conducted seven site visits (June 1 and 2, July 10 and 11, August 7, and September 24 and 25, 2012). GLA noted and mapped SNBS detected during the site visits.

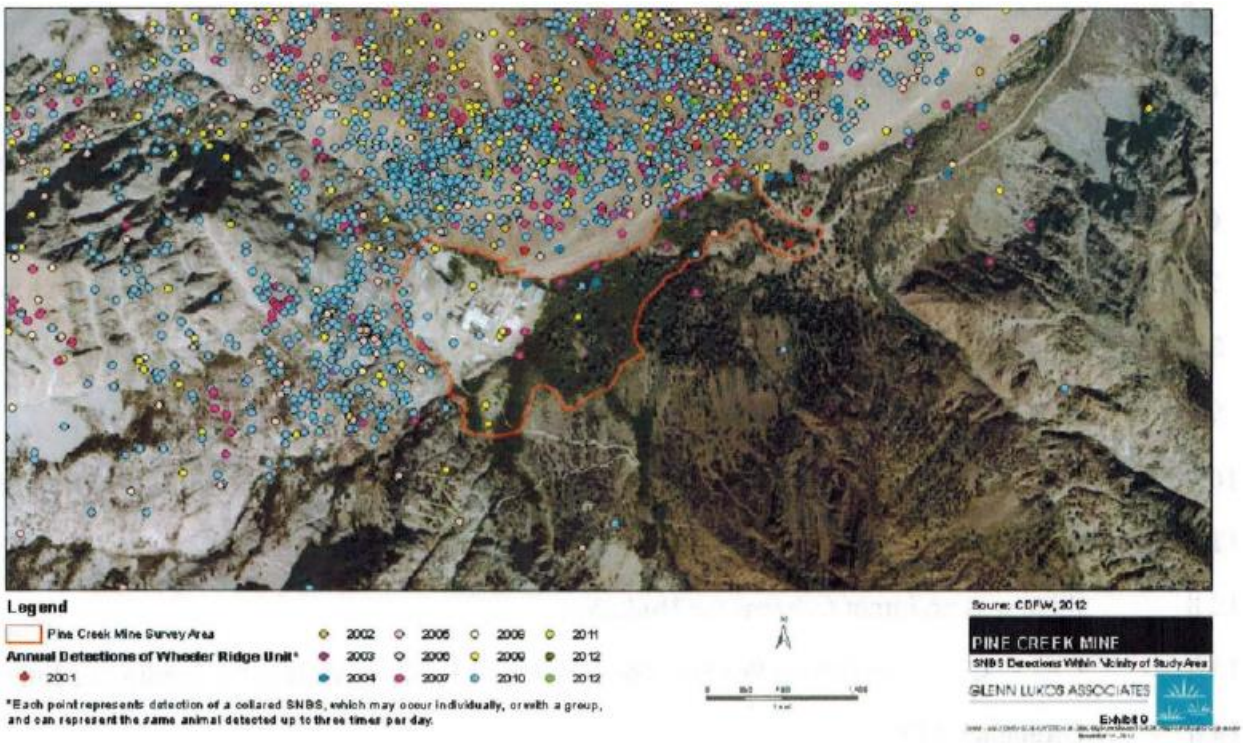

Figure 9.1.2: SNBS Detections within vicinity of study area

Bats

Portions of the Project area contain suitable habitat for various bat species, particularly rocky outcrops and crevices in cliff faces adjacent to the site, as well as the two primary mine portals (the Main Portal and the Easy-Go Adit). Dr. Patricia Brown (Brown-Berry Biological Consulting) conducted four focused bat surveys within the two mine portals. Two more mine portals lie approximately 400 feet due south of the Main Portal and Easy-Go Adit, but were not surveyed, as the Project will not affect these portals.

Dr. Brown conducted both summer out-flight and winter bat surveys. The first summer survey was conducted on August 21, 2011, with the second summer survey conducted on June 1, 2012. Winter bat surveys were conducted on January 2, 2012 and February 16, 2012. All surveys were conducted by walking slowly from the entrances of the Main Portal and Easy-Go Adit to the existing concrete plug (approximately 2,500 feet into the mine). Bright lights were used to visually scan all areas determined to be suitable for hibernating bats, as well as the floor of the mine for bat sign such as guano.

For the summer out-flight surveys, Anabat II acoustic ultrasound detectors were also used to identify bats. On August 21, 2011, one detector was placed at the Easy-Go Adit portal entrance and another was placed in a nearby open area adjacent to the

mine buildings. On June 1, 2012, detectors were placed at each portal entrance. During both surveys, night vision (augmented by infrared lighting) was employed to detect bats entering and exiting the two portal entrances for 60 minutes after dusk. Bats were counted using finger tallies as they entered and exited from the portals.

Identification of species from Anabat II recordings was made by comparison with "voucher" calls from known, hand-released bats. "Search phase" calls, emitted while bats are foraging, are often much more definitive than "voucher" calls, but may differ from the hand-released bat "voucher" calls. Additionally, different bat species may also utilize similar signals or the same species may employ a variety of signals based on the perceptual task and surrounding habitat.

When bats are flying within a confined space, such as a mine portal, the signals can vary from search phase calls. Usually the ending frequency in a FM (frequency modulated) signal is the most diagnostic, since atmospheric attenuation of the higher frequencies in the call is more severe than the lower based on the perceptual task and surrounding habitat. A knowledge of which bats are common to the area as well as bats that may be present but uncommon is essential to the acoustic identification process. Several points need to be considered when interpreting the acoustic data: some calls will be misidentified; the louder bats will be over represented; "whispering" bats such as Townsend's big-eared bats may not be recorded; and the number of calls recorded is an index of bat activity and does not equate to the number of bats.

GLA biologists also surveyed the Project area on the evenings of June 2, July 11, August 7, and September 24, 2012. GLA biologists surveyed the mine from the entrances of both portals, to the existing concrete plug. Surveys were conducted by two biologists walking side-by-side in a slow and methodical manner. Flashlights were used to thoroughly scan the floors, walls and ceilings of the mine for any roosting bats or bat sign. A small number of bats was detected outside of the mine, or entering the mine. The low number detected suggests a minimal potential for a maternity colony to occur within the mine. It is likely that these resident bats are male bats roosting in a side drift of the mine, where ambient temperatures are higher than that of the major portals.

No special-status bats were detected within the Project study area during the surveys. (GLA, 2013)

Amphibians

Portions of the Project study area contains potentially suitable habitat for special-status amphibians, including the Yosemite Toad (Bufo canorus), Sierra Nevada Yellow-legged Frog (Rana sierrae), and the Mount Lyell Salamander (Hydromantes platycephalus). A discussion of each species is provided below. GLA biologists conducted focused amphibian surveys during all site visits (June 1 and 2, July 10 and 11, August 7, and September 24 and 25, 2012). Focused surveys for the

Yosemite toad and Sierra Nevada yellow-legged frog followed accepted amphibian sampling protocols (Crump and Scott 1994, Fellers and Freel 1995, Lind 1997, Seltenrich and Pool 2002, and Thorns et al. 1997). The survey visits included both daytime and nighttime visual inspection surveys of all areas of suitable habitat including the man-made ponds and slow-moving areas of the creeks in order to search for egg masses, tadpoles, and/or adults. Where appropriate, GLA biologists sampled areas of suitable habitat using dip nets

Surveys were concentrated within the reaches of Pine Creek and Morgan Creek, but other areas of potentially suitable habitat were considered within the overall Project study area. Focused surveys for the Mount Lyell salamander were conducted in conjunction with the Yosemite toad and yellow-legged frog within areas of Pine and Morgan Creeks and within rocky areas in close proximity to man-made pools located within the disturbed mine footprint. In addition, because salamanders have been detected in mines (P. Brown, personal communication, June 1, 2012), GLA biologists surveyed inside the mine from the portal entrances to the existing concrete plug using flashlights to scan the walls and floors of the mine.

In addition, GLA conducted a thorough literature review of sensitive amphibian locations within the vicinity of the Proposed Project from a variety of sources which include but are not limited to: (1) California Natural Diversity Database (CNDDB 2013), (2) personal communication with CDFW Fisheries Biologist James Erdman, (3) review of CDFW High Mountain Lake (HML) surveys day provided by Mr. Erdman, and (4) review of Mt. Lyell salamander location data from Chris Fichtel (October 2004), provided by Mr. Erdman. All known sensitive amphibian species locations within the vicinity of the Project were included in the surveys. No special-status amphibians were detected within the Project study area during the surveys.

Yosemite Toad

The Yosemite Toad was designated as a Federally Threatened Species on April 27, 2014 (Federal Register: 24,256- 24,310, April 27, 2014). The Yosemite Toad is endemic to California and occurs in the Sierra Nevada from the Blue Lakes region north of Ebbetts Pass (Alpine County) south to 5 km south of Kaiser Pass in the Evolution Lake/Darwin Canyon area (Fresno County). Its known elevational range extends from 1950 meters (Aspen Valley, Tuolumne County) to 3450 meters (Mount Dana, Tuolumne County (Karlstrom 1962).

The Yosemite Toad is a high elevation endemic that generally occurs in high montane and subalpine associations in open montane meadows, although forest cover around meadows has also been reported (Karlstrom 1962, Kagarise Sherman and Morton 1984). It is generally never far from a permanent source of water, even though it spends most of its time on land. The Yosemite Toad overwinter in rodent burrows. Generally they prefer the burrows of Belding's ground squirrels (Spermophilus beldingi) and yellow-bellied marmots (Marmota flaviventris) most

likely because their greater burrow depths most likely make such overwintering sites less susceptible to freezing

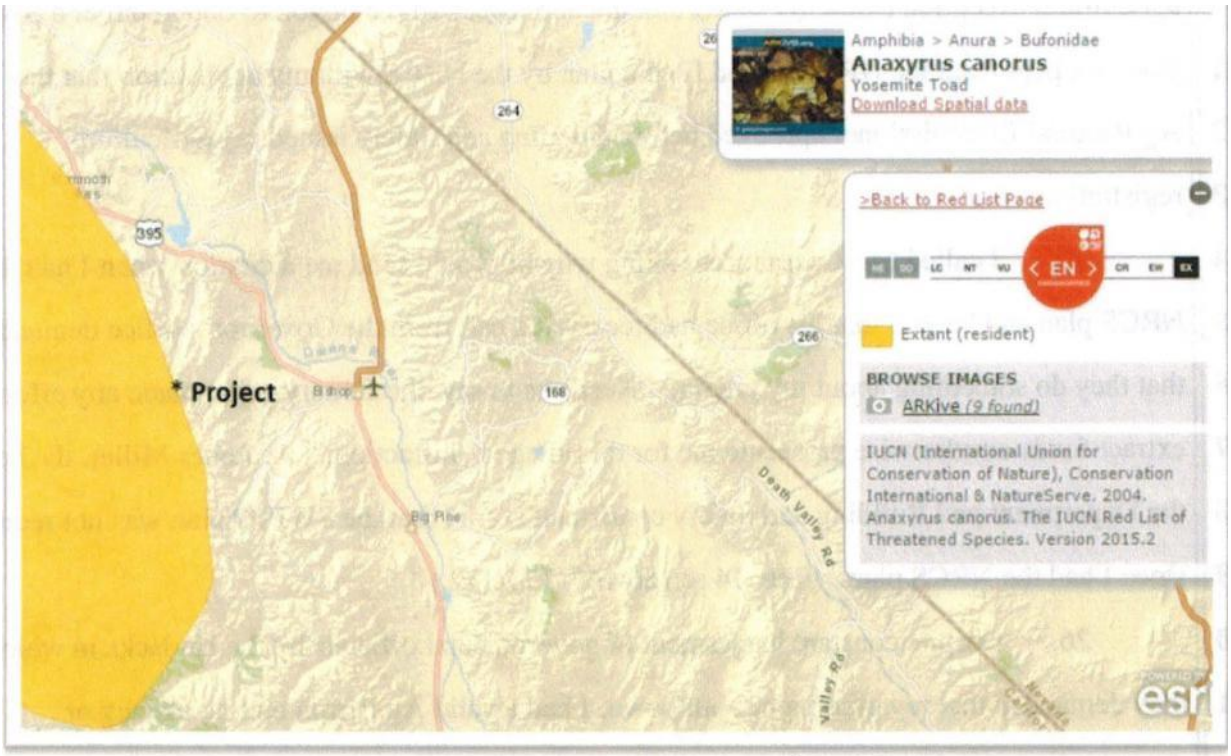

Figure 9.1.3. The approximate location of critical habitat for the Yosemite Toad in relation to the proposed Project.

(Kagarise Sherman 1980). These burrows are also probably used as temporary refuge sites during the summer season (Mullally and Cunningham 1956).

The Yosemite Toad is predominantly diurnal and emerges from winter hibernation as soon as snow-melt pools form near their winter refuge sites (Karlstrom 1962, and Kagarise Sherman 1980). Yosemite toads generally emerge from early May to mid-June, but will vary with elevation and season (Kagarise Sherman 1980). No Yosemite Toads or evidence of their existence was noted during any surveys.

The map below shows the approximate location of critical habitat for the Yosemite Toad in relation to the proposed Project. The Project Boundary is considered within the critical habitat area.

Sierra Nevada Yellow-legged Frog

The Sierra Nevada Yellow-legged Frog was designated as a Federally Endangered Species on April 27, 2014 (Federal Register: 24,256- 24,310, April 27, 2014). Until recently, R. sierra and the Mountain Yellow-legged Frog (R. muscosa) were considered the same species. Historically, R. sierra ranged from the Diamond

Mountains northeast of the Sierra Nevada in Plumas County, California, south through the Sierra Nevada to the type locality, the southern-most locality (Inyo County). In the extreme northwest region of the Sierra Nevada, several populations occur just north of the Feather River, and to the east, there was a population on Mt. Rose, northeast of Lake Tahoe in Washoe County, Nevada, but it is now extinct. West of the Sierra Nevada crest, the southern part of the R. sierrae range is bordered by ridges that divide the Middle and South Fork of the Kings River, ranging from Mather Pass to the Monarch Divide. East of the Sierra Nevada crest, R. sierrae occurs in the Glass Mountains just south of Mono Lake (Mono County) and along the east slope of the Sierra Nevada south to the type locality at

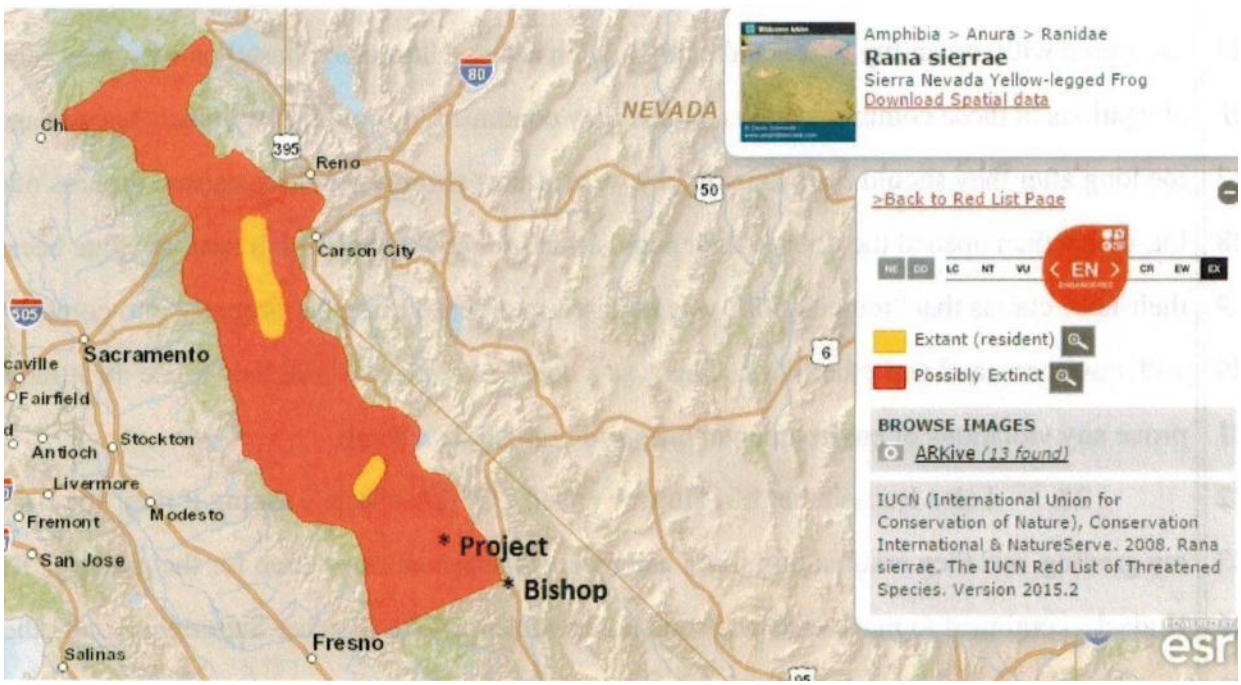

Figure 9.1.4. The location of critical habitat for the Sierra Nevada Yellow-Legged Frog in relation to the proposed Project.

Matlock Lake (Inyo County) (Vredenburg, et al, 2007.). R. sierrae inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada Mountains. Open stream and lake edges with a gentle slope up to a depth of 5 to 8 cm seem to be preferred. Waters that do not freeze to the bottom and which do not dry up are required. If a body of water used for breeding dries up for just one season, 3 to 4 generations of tadpoles will be destroyed.

Egg-laying sites must be connected to permanent lakes or ponds that do not freeze to the bottom in winter, because the tadpoles overwinter, possibly taking as many as 3 or 4 summers before they transform. No Mountain Yellow-legged Frog or evidence of their existence was noted during any surveys.

Mount Lyell Salamander

The Mount Lyell Salamander is designated as a California Species of Special Concern (and is one of three recognized species in the genus Hydromantes from California (Gorman 1988).

Mount Lyell Salamanders are endemic to California and their range extends from the Smith Lake area (El Dorado County) to the Franklin Pass area (Tulare County) in the Sierra Nevada Mountains (Jennings and Hayes 1994). An isolated population is present on the Sierra Buttes, Sierra County (Stebbins 1985). Its known elevational range extends from 1260 meters to 3635 meters.

The season of near-surface activity ranges from around May 1 to late August, after which individuals probably retreat to refuge in talus slopes and fissures with sufficient moisture.

Mount Lyell Salamanders are largely restricted to alpine or subalpine vegetation associations (Adams 1938, 1942; Stebbins 1951), although scattered records of this species exist from somewhat lower elevations. Extensive outcrops of rock and scattered boulders are characteristic of the habitat of this species (Stebbins 1985). Free surface water, such as a permanent stream, waterfall, seepage, or runoff from melting snow, is almost always present within a few meters, and usually within a few centimeters, of the sites where this species is present as it has been described as being no more resistance to water loss than wet paper (Gorman 1988). This high elevation endemic is most frequently found beneath rocks on a moist-to-wet substrate of rock and soil with little humus (Gorman 1988), on north and east slopes (Zeiner et al. 1988). Woody vegetation is typically sparse or absent altogether; but grasses, sedges, mosses, or lichens may be present.

No Mount Lyell Salamanders or evidence of their existence was noted during any surveys however, evidence of potential occurrence is noted based on the CNDDB record.

FAUNAL COMPENDIUM

The faunal compendium lists species that were either detected within or adjacent to the Project Site, either by direct observation or the presence of sign. Taxonomy and nomenclature are based on the following:

- Butterflies: Taxonomy and phylogeny is based on Jonathan Pelham. 2008. Catalogue of the Butterflies of the United States and Canada. Journal of Research on the Lepidoptera 40: xiv + 658 pp. North American Butterfly Association (2001. NABA checklist & English names of North American butterflies, second edition. North American Butterfly Association, Morristown, New Jersey.).
- Fishes: Moyle, P.B. (2002. Inland Fishes of California, second edition. University of California Press, Berkeley.).
- Amphibians and reptiles: Crother, B.I. et al (2000. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. *Herpetological Circular* 29; and 2008 update.) for species taxonomy and nomenclature; Stebbins, R.C. (2003. A Field Guide to Western Reptiles and Amphibians, third edition., Houghton Mifflin, Boston.) for sequence and higher order taxonomy. Center for North American Herpetology (2013).
- Birds: American Ornithologists' Union (1998. The A.O.U. Checklist of North American Birds, seventh edition. American Ornithologists' Union, Washington D.C.; and 2000, 2002, 2003, and 2004 supplements.).
- Mammals: Grenfell, W.E., Parisi, M.D. and McGriff, D. (2003. Complete list of amphibians, reptiles, birds and mammals in California. California Department of Fish and Wildlife. http://www.dfg.ca.gov/whdab/pdfs/species_list.pdf).

LEPIDOPTERA

BUTTERFLIES

PAPILIONIDAE
Papilio zelicaon

Swallowtails
anise swallowtail

NYMPHALIDAE
Phyciodes mylitta
Nymphalis antiopa
Limenitis lorquini
Adelpha bredowii californica

Brush-Footed Butterflies
Mylitta crescent
mourning cloak
Lorquin's admiral
California sister

ARCTIIDAE
Lophocampa maculata

Tiger moths and lichen moths
Spotted tussock moth

HIRUNDINIDAE	**Swallows**
Tachycineta thalassina	violet-green swallow
PARIDAE	**Chickadees And Titmice**
Poecile gambeli	mountain chickadee
TROGLODYTIDAE	**Wrens**
Catherpes mexicanus	canyon wren
Salpinctes obsoletus	rock wren
Troglodytes aedon	house wren
CINCLIDAE	**Dippers**
Cinclus mexicanus	American dipper
TURDIDAE	**Thrushes**
Sialia currucoides	mountain bluebird
Myadestes townsendi	Townsend's solitaire
Turdus migratorius	American robin
MOTACILLIDAE	**Wagtails And Pipits**
Anthus rubescens	American pipit
PARULIDAE	**Wood Warblers And Relatives**
Dendroica petechia	yellow warbler
Oreothlypis luciae	Lucy's warbler
EMBERIZIDAE	**Emberizids**
Pipilo maculatus	spotted towhee
Melospiza melodia	song sparrow
Zonotrichia leucophrys	white-crowned sparrow
Junco hyemalis	dark-eyed junco
CARDINALIDAE	**Cardinals, Grosbeaks And Allies**
Piranga ludoviciana	western tanager
Pheucticus melanocephalus	black-headed grosbeak
ICTERIDAE	**Blackbirds**
Molothrus ater	brown-headed cowbird
Icterus bullockii	Bullock's oriole
FRINGILLIDAE	**Fringilline And Carduline Finches and Allies**
Haemorhous mexicanus	house finch

OSTEICHTHEYS	BONY FISHES
SALMONIDAE	**Salmon And Trout**
Oncorhynchus mykiss	rainbow trout
Oncorhynchus mykiss irideus	coastal rainbow trout
Oncorhynchus mykiss aguabonita	California golden rainbow trout
	hybrid
Salmo trutta	brown trout
Salvelinus fontinalis	brook trout
REPTILIA	**REPTILES**
PHRYNOSOMATIDAE	**Phrynosomatid Lizards**
Uta stansburiana	common side-blotched lizard
Sceloporus occidentalis	western fence lizard
BOIDAE	**Boas**
Charina bottae	rubber boa
AVES	**BIRDS**
ODONTOPHORIDAE	**New World Quail**
Callipepla californica	California quail
GALLIFORMES	**Wildfowl**
Dendragapus fuliginosus	Sooty grouse
COLUMBIDAE	**Pigeons And doves**
Zenaida macroura	mourning dove
TROCHILIDAE	**Hummingbirds**
Selasphorus platycercus	broad-tailed hummingbird
PICIDAE	**Woodpeckers And Allies**
Melanerpes formicivorus	acorn woodpecker
Sphyrapicus ruber	red-breasted sapsucker
TYRANNIDAE	**Tyrant Flycatchers**
Contopus cooperi	olive-sided flycatcher
CORVIDAE	**Crows And Jays**
Cyanocitta stelleri	Steller's jay
Nucifraga columbiana	Clark's nutcracker

MAMMALIA	MAMMALS
VERSPERTILIONIDAE	**Evening Bats**
Euderma maculatum	spotted bat
Myotis lucifugus	little brown myotis
Myotis yumanensis	Yuma myotis
Myotis volans	long-legged myotis
Eptesicus fuscus	big brown bat
Lasiurus cinereus	hoary bat
LEPORIDAE	**Rabbits And Hares**
Sylvilagus auduboni	desert (Audubon's) cottontail
Lepus californicus	black-tailed jackrabbit
MURIDAE	**Mice, Rats And Voles**
Phenacomys intermedius	heather vole
SCIURIDAE	**Squirrels, Chipmunks, And Marmots**
Marmota flaviventris	yellow-bellied marmot
CANIDAE	**Foxes, Wolves And Allies**
Vulpes vulpes	red fox
CERVIDAE	**Deer, Elk And Allies**
Odocoileus hemionus	mule deer
BOVIDAE	**Sheep, Goats And Allies**
Ovis canadensis	bighorn sheep
Ovis canadensis sierra	Sierra Nevada bighorn sheep

9.1.5 Wetlands and Riparian Habitats

According to the National Wetland Inventory (NWI), maintained by the USFWS, no wetlands are located within or adjacent to the Project. What wetlands occur in the general region are scarce and consist of small palustrine wetlands with unconsolidated bottoms or shores. This wetland type describes shallow features with less than 30 percent vegetative cover and mostly muddy bottoms (Cowardin, et al. 1979).

Riparian habitat in the Project area is well-established along the Morgan Creek and Pine Creek, downstream of the Project and outside the Project boundary. The riparian corridor is about 50 to 200 feet wide and lies in contrast to the surrounding sagebrush scrub vegetation. In the project area, vegetation is represented by three Alliances (per the CalVeg classification). They consist of Water Birch, Quaking Aspen, and Willow Scrub (USDA, 2005). Of these three riparian Alliances, the occurrence of Water Birch is tracked due to some concern regarding its decreasing range. The Water Birch Alliance occurs several times along Morgan and Pine Creeks near the Project.

Additional descriptions of the riparian habitat along the creeks document Black Cottonwood, Jeffrey Pine, and Wild Rose as dominant species. Lower Morgan Creek has been described as having 100 percent ground cover, whereas Upper Morgan Creek flows through a narrow incised channel lined with a single row of water birches. The riparian community in the lower reaches of Morgan Creek and Pine Creek appears to be less dependent on stream flows than on the combined effect of numerous surface springs and downslope movement of subsurface water towards Pine Creek (USFS, 1988).

9.2 Consultation with the USFS

During the ILP, Applicant consulted with the USFS on multiple occasions, including a site visit and several scoping meetings that resulted in a FERC-approved Study Plan consisting of ten proposed environmental studies. Additionally, Applicant's biological consultants contacted the Bishop office of the USFS to coordinate their various field studies.

9.3 Project Effects on Terrestrial Resources

9.3.1 Threatened, Endangered and Special-Status Species

GLA's 2013 studies did not identify any ESA- and CESA-listed, FP, BCC or other special- status species in the FERC Project Boundary with the exception of the Sierra Nevada Bighorn Sheep. The majority of special-status species do not have a reasonable potential to occur on the Project and thus, would not be affected by the Project.

For species that might occur on the Project, Project O&M necessary for operations has the potential to affect special-status wildlife by way of occasional disturbance. Noise and movement generated by O&M could potentially disrupt local wildlife for short durations. However, because these O&M activities are expected to be very infrequent in both scope and duration (as described in Section 2.1.2), the effects are expected to be de minimis and unlikely to be concentrated on a particular species or habitat.

Pine Creek's use of the access road for O&M is limited (typically 1-2 trips per day), similar to that of other non-project users, as has been the case historically. No evidence of wildlife disturbance from road use was observed during surveys from either Project or non-Project related activity.

Analysis from GLA's wildlife study concludes that construction and ongoing operations of the Proposed Project will not adversely affect special-status wildlife, and any effects that may occur are expected to be limited in scope and duration.

9.3.2 Noxious Weeds

The use of public and private roads may support the dispersal of noxious weeds, as seeds are transported on vehicles or footwear. Pine Creek's use of the road is limited to approximately 1-2 times regularly. Because of that limited use, the degree of actual Project effects on noxious weed dispersal is believed to be de minimis. In general, little management is required and the bulk of the area remains unmanaged by Pine Creek.

The limited ground disturbance and infrequency of Project activities above ground also minimizes their likelihood of spreading noxious woods.

9.3.3 [Not Used]

9.3.4 Wetlands and Riparian Habitats

No concerns about wetlands within the Project area were identified during scoping, which included detailed evaluations of wetlands that could be affected by Project construction and operations. Scoping identified the effect of continued Project flow releases on the distribution and quantity of riparian habitat along the Morgan Creek and Pine Creek as an issue to be analyzed. The discussion below addresses the effects of Project operations and other Project-related activities on wetlands and riparian areas.

9.3.5 Applicant-Proposed Environmental Measures

No environmental measures directly relating to terrestrial resources are proposed, and none have been recommended by any resource agency or interested party.

10.0 ENVIRONMENTAL ANALYSIS OF LAND USE, RECREATION, AND AESTHETIC RESOURCES AND WILDFIRE RISK MANAGEMENT

10.1 Affected Environment

10.1.1 Land Use

10.1.1.1 Land Use Adjacent to the Project

Numerous lakes, campgrounds, and trails are located in the general Project area, all of which are on USFS lands. Many recreation opportunities lie within a 15-mile radius of the Project, including fishing, hiking, camping, rock climbing, and animal packing (i.e., horse, mule, etc.). Hunting and wildlife watching for such species as deer, bear, mountain sheep, elk, pig, and upland game birds also occur in the area (CDFG, 2007).

There are over 15 campgrounds within a 10-mile radius of the Project site. All of the campgrounds are located on USFS lands, including the John Muir Wilderness Area and the Inyo National Forest. Besides the camping opportunities provided by the Inyo National Forest and John Muir Wilderness Area, the area contains no known developed recreation facilities. In the lands that immediately surround the Project, backpackers use an existing trailhead for access into the eastern Sierra Nevada. A seasonal pack station adjacent to the private land is located in the Inyo National Forest and provides access to nearby Pine Lake.

No developed overnight camping facilities exist in the immediate area. In 1988, the Inyo National Forest recorded almost two million recreation visitor days (Inyo National Forest, 1988).

There are several small, high-altitude lakes in the vicinity of the Project. Morgan Lake is located two miles northwest of the project and offers fishing activities. Pine Lake is located approximately 1.5 miles southwest of the Project. Activities at these lakes include fishing and camping. Brook Trout, Golden Trout, Brown Trout, and Rainbow Trout are found in creeks both upstream and downstream of the Project.

Although the Project is surrounded by the Inyo National Forest, on which public use for recreation is allowed, there are no opportunities or facilities for recreational activities within the Project boundary and no recreation activities will be affected by the Project.

10.1.1.2 Road Use

Other than the existing mining, milling, processing, and residential structures of the idle mine, there is no residential or commercial development in the Project area. A seasonally operated Pine Creek pack station located on adjacent Inyo National Forest land below the mine is the sole nearby structure. A single paved road leads to the nearest community, Rovana (pop. 220), located approximately 10 miles to the northeast (ICGP, 2001).

The existing maintenance roads are used almost exclusively for access to non-Project facilities. The number of trips on these maintenance roads for Project O&M is estimated to occur on average 1-2 times per week.

10.1.2 Recreation Resources

No recreation facilities or features occur on Project lands. Although surrounded by the Inyo National Forest, on which public use for recreation is allowed, the Project is essentially underground, with the terminus at the existing Pine Creek Mine site near the confluence of Morgan and Pine Creeks. Accordingly, there are no opportunities or facilities for recreational activities within the Project boundary and thus the Project will not affect recreation activities.

10.1.3 Aesthetic Resources

Pine Creek Mine sits at the end of Pine Creek Canyon, around which several mountains rise abruptly. It is bounded on the immediate north by Mt. Morgan (13,748 feet) and Wheeler Ridge, and on the south by Mount Tom (13,652 feet). Remote and rugged, the landscape is characteristic of the High Sierras: deep canyons, meadows, numerous lakes and streams, conifer and pine forests.

Above the timberline steep granite walls and snow-covered peaks rise, with considerable talus and increasingly sparse vegetation. There are several trailheads in the immediate Project area, one of which is located near the pack station.

Because the Project is in a remote, mountainous area with rugged forested topography, many of the facilities, including tunnel/pipeline routes, are not visible to area visitors or residents. All Project works will be underground within the existing Pine Creek Mine.

10.1.4 Wildland Fire Risk Management

All Project works will be underground within the existing Pine Creek Mine.

10.1.5 Project Effects on Land Use, Recreation, Aesthetic Resources and Fire Risk Management

10.1.5.1 Land Use

Not applicable.

10.1.5.2 Project Effects on Adjacent Land Use

Although surrounded by the Inyo National Forest, on which public use for recreation is allowed, the Project is underground, with the terminus at the existing Pine Creek Mine site near the confluence of Morgan and Pine Creeks. The Project does not affect the rural nature of the landscape.

10.1.5.3 Road Use

No new roads are proposed as part of the Project. There will be only slightly increased trip-uses of the existing roads as a result of the Project. The Project is accessed by roads developed for routine O&M of other adjacent non-Project facilities. No effects to area roads are expected during construction or operations.

10.1.5.4 Recreation

There are no developed recreation facilities within the FERC Project Boundary, and the Project does not provide access to any recreation resources in the area. No effects on recreation resources are expected.

10.1.5.5 Aesthetic Resources

All Project works will be underground within the existing Pine Creek Mine. As a result, no effects on aesthetic resources are expected.

10.1.5.6 Wildfire Risk Management

Pine Creek will be required to operate the Project in a fire-safe manner and comply with regulations designed to reduce the risk of wild fires occurring as a result of Project operations and maintenance. All Project works will be underground within the existing Pine Creek Mine. No increase in fire risk is expected. The risk of fire from Project operations is probably nonexistent.

10.1.5.7 Applicant-proposed Measures

No environmental measures directly relating to land use, recreation and aesthetic resources or wildfire risk management are proposed, and none have been recommended by any resource agency or interested party.

10.1.5.8 Environmental Effects of Applicant-proposed Measures

No environmental measures have been recommended or are proposed**.**

11.0 ENVIRONMENTAL ANALYSIS OF CULTURAL AND TRIBAL RESOURCES

11.1 Regulatory Context

As detailed in Section 3.2.4, License of the Project must comply with Section 106 of the NHPA, which requires FERC, as the lead federal agency, to take into account the effects of issuing a new license to Pine Creek on historic properties identified within the Project APE.

The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[d]). In this case, the APE is defined to include all lands, Project facilities and features within the FERC Project Boundary.

11.2 Cultural Context Overview

Archival research conducted as part of the License effort provided background information relevant to understanding past Native American lifeways and cultural sequences, and historic period developments within and adjacent to the Project. Based on this gathered background information, a cultural overview is provided below.

11.2.1 Prehistory

Native American Background

The Numu, or Northern Paiute, claim the Project area, and it is the location of at least two creation stories (discussed below). Descriptions of the historic Northern Paiute have been made by Powers (1877), Powell in 1880 (Fowler and Fowler 1971), and others. C. Hart Merriam (1898-1938) conducted studies in the area, and recorded the name the people gave to Round Valley, the area immediately below the Project, as Kwe-nah-bah', with the people themselves identified as the Kwe-nah-bah'-te. The first comprehensive work on Northern Paiute was conducted by Lowie (1924), followed by a number of researchers who worked with various Paiute groups. For example, Park (see Fowler 1989) investigated the Walker River and Pyramid Lake Paiute, while Emma Lou Davis worked with the Mono Lake and Bridgeport Paiute. In the Great Basin volume of the Handbook of North American Indians, Catherine Fowler and Sven Liljeblad (1986) provided a detailed look at the Northern Paiute, with the same two authors also reviewing the Owens Valley Paiute (Liljeblad and Fowler 1986). Some researchers also give this project area over to the Owens Valley Paiute (e.g., Steward 1933).

Northern Paiute people are a geographically large and culturally distinct group tied by language to other Paiute and other Numic speaking groups (Fowler and Liljeblad 1986). According to Fowler (1992:7), the Northern Paiute occupied a territory that extended from the John Day River in the north, through eastern Oregon, western Nevada, and into east-central California, perhaps sharing the Project area with the Owens Valley Paiute. Which subgroup of Northern Paiute was in the area was not researched for this study, but it may be that the Kwe-nah-bah'-te name recorded by Merriam (supra) is a subgroup rather than a name of a people from a specific geographic region. It is also possible that the Kutzadikaa (brine fly pupae-eaters), whose province centered on Mono Lake in Mono County to the north, or the Long Valley Caldera subgroup, called this area home.

George Brown

George Brown, born about 1898, was a well-known Paiute in the Project area (Brown 1991). Native to Round Valley, he was very familiar with the Pine and Morgan creek areas, and gained a reputation as a muleskinner hauling up the steep canyons. Before the roads were built up to the mines, it was the mules, because of

their sure-footedness, that were used to transport mining supplies (including timber), food, camp supplies, and more. And it was Paiute George Brown who led those supply-packed mules up the steep canyon. In the early 1930s, George Brown started the Pine Creek Pack Outfit and guided people, supplies, and equipment up into Pine Creek and over Pine Pass into the high country (Brown 1991). In 1937, Brown was contracted to haul equipment and supplies to build the Tungstar mine's power lines (Brown 1991; Kurtak 2007:50), among other arrangements to haul for the mining companies.

His pack operations even included mail delivery in the winter (Kurtak [2007] has a number of photos depicting George Brown and his mule train (Brown 1991). Other companies, including competing tungsten mines, the California Interstate Telephone Company, and the California Electric Power Company also depended upon George Brown for hauling. Brown established his Pine Creek Pack Outfit, familiarly known as Brown's Camp, located "at the end of Pine Creek road" (Kurtak 2007:52) that is in roughly the same location as is the Pine Creek Pack Station today. The Pine Creek Road (then perhaps called the Morgan Creek Road?) was completed in the early 1940s, and George sold the pack station to Spray and Ernest Kinney in 1943 (Brown 1991).

11.2.2 History

The following discussion addresses the history of Pine Creek Mine in Inyo County, California from its founding to its closure, and places Pine Creek within the historic context of tungsten mining in the United States. It reviews key periods of development including the discovery, use, and industrial development of tungsten during World War I, the Great Depression, World War II, the Korean War and Government Stockpile Program, and Vietnam War. The mine underwent several stages of development under different ownership. The existing structures of the mine including the Easy Go Adit were primarily developed during and after World War II, and are located at an elevation of 8,063 feet. The history of tunneling into the mountain is a complicated tale, and begins in 1918 at the 11,300-foot level.

Early History of Tungsten and the Pine Creek Mine (1750s — 1914)

Tungsten was not commercially useful until early in the 20th century. Tungsten has the highest melting point of any metal at 3400° C, and is resistant to corrosion by acids. It is part of the wolframite and scheelite mineral groups, which were twice independently discovered in 1758 and 1781, respectively. At that time, no practical uses were known, because, as noted by metallurgical engineer W.P. Sykes, "no one had succeeded in overcoming the brittleness so typical of the unworked metal at room temperature." As metallurgical developments led to new fabrication methods, metallurgists discovered practical uses for tungsten. Commercial use of tungsten began in 1905, and it was primarily applied in fireproofing cloth used as curtains or drapery, as a mordant in dyeing, and in silk manufacture to add weight to the fabric.

By 1908 it was used more extensively, as industries developed complicated technical and scientific methods of working the metal. This led to production of ductile tungsten wire and use of tungsten in production of steel alloys to increase their hardness. Tungsten wire was crucial for making practical incandescent lights, because its high melting point meant tungsten wire could withstand heat generated in light bulbs (Engineering and Mining Journal [EMJ], 11 November 1907:818; Kurtak 1998:6- 7; Mathewson 1953:450-452; Ridge 1968:1553).

By 1910, production of tungsten in the US, by state, in order of importance, was in Colorado, California, and Arizona. The Atolia Mining Company in San Bernardino was the largest producer of tungsten in California, and maintained this status into 1940. In 1912, new uses for tungsten included its use in the Röntgen tube or x-ray, which "gave the ray operator an indestructible target, upon which the cathode rays may be more closely focused, resulting in shaper definition and shorter exposure." However, it was its use for projectiles and armaments that greatly increased demand during times of war (Department of the Interior, Bureau of Mines [DOI, BM] 1938:568-570; EMJ, 11 November 1907:818; EMJ, 27 January 1912:211).

Pine Creek deposits, located in the Sierra Nevada at an elevation of 11,400 feet, were first discovered by mineral surveyor M.B. Sherwin as a silver-lead deposit. However, the laim lapsed when the assay results were obtained (EMJ, 10 April 1926:6).

World War I and Aftermath (1914 - 1923)

World War I generated a high demand for resources, including tungsten. The price of tungsten climbed to unprecedented heights, and John Ridge, editor of Ore Deposits in the United States, noted that "the wartime boom reached a peak in April 1916 with some concentrates selling for $93.50 per short ton unit of [tungsten oxide] WO2 at the mills." By 1918, California was a leading producer of tungsten with its primary output coming from the Atolia Mining Company. At this time, the mines of lnyo County were becoming large producers of tungsten (EMJ, 12 January 1918:90-93; EMJ, 16 February 1918:354; EMJ, 15 June 1918:1109; EMJ, 8 February 1919:285; Ridge 1968:1553).

With high prices and demand for tungsten in 1916, Standard Tungsten Company and Tungsten Mines Company developed claims in the Tungsten Hills west of Bishop. These two companies erected several mills with regularly capacities of 30, 50 and 300 tons each, built roads, brought power in from Bishop Creek, and established a permanent camp later called Brown's Camp. This development encouraged continued prospecting around Bishop. On April 22nd 1916, Billie Vaughn and Arch Beauregard relocated the claims at Pine Creek. They began mining with a 6 x 15 Wilfey concentrating table, which was cut into three sections to fit onto mules for transport up the mountain. Historian Joseph Kurtak reported, "Once in place, a stream of water mixed with sand-sized material was run across the table surface which vibrated with a side-jerking motion," which "allowed minerals

with high specific gravities such as molybdenite and scheelite to concentrate at one end of the table and worthless sand at the other." Vaughn and Beauregard screened ore across this table and packed it back down the mountain on mules, because they could not get heavy crushing equipment to the mine. They received financial support from Cooper Shapely and Fred Close to further develop the mine, and formed Pine Creek Tungsten Company in 1918 with Shapely as president. This company built a switch back road on the mountain to reach the mine, brought power to the site, and erected a mill with a 300 ton regularly capacity, which was in operation by December of that year (EMJ, 29 April 1916:797; EMJ, 5 August 1916:271-272; EMJ, 12 August 1916:313; Knopf 1916:230-231). Kurtak noted that there was, a 2,200 ft. three-rail gravity tramway [, which] brought the ore from the mine portal down to the mill in small skips. Water came to the mill site via a 2,000 ft. pipeline from a dam built on one of the Morgan Lakes. In the mill a jaw crusher and ball mill ground the ore into sand-size grains. These were mixed with water and run across a system of five concentrating tables, similar in design to the original used by the Beauregards. The tabled concentrates were dried and bagged for shipment ... (Kurtak 1998:28).

Pine Creek Tungsten Company drove the first tunnel into the mountain, into what was later called the south ore body. The mine operated at an elevation of 11,300 feet, and was the highest operating mine in California. Levels A and B and the Glory Hole were part of the mining operations in the south ore body (See Figure 5.9.07). With the end of World War I and the import of cheaper Chinese concentrates, prices for US-produced tungsten fell, causing the market to collapse. Eventually all tungsten mines in the United States stopped production and shut down. The Pine Creek Tungsten Company went bankrupt in 1919 after processing only 4,371 tons of ore, and it was, as Kurtak noted, "barely enough to get the machinery running properly" (Kurtak 1998:27-28; Ridge 1968:1534).

The Great Depression (1924 — 1939)

Tungsten mines in China dominated the world market between 1919 and 1926, and the Federal Bureau of Mines at this time reported that "the principal uses of tungsten are in the manufacture of high-speed-tool steels, cemented tungsten carbides, stellites, and electric-light and radio-tube filaments; in the preparation of various chemicals, such as pigments; and in the tanning of white leather." A tariff of 200 percent was set to stimulate mining in the United States by raising the price of imported tungsten, and Pine Creek reopened under the ownership of Tungsten Products Company in 1924. They implemented improvements to the mine including a new adit at 11,000 feet, drilled below the upper adit originally constructed by Pine Creek Tungsten Company, to improve ore-handling. Mining was conducted by the operation of a glory hole or open pit, a mining technique that used a system of haulage ways beneath a block of ore. The Engineering and Mining Journal described machinery and techniques at the mine, reporting that "Ingersoll-Rand drills, No. 248 were used in adit work; Sullivan D.O. 33 and Denver Rock Drill No. 93, hand held drills, in glory hole work, and a No. 73 wet stopper for raising." The Journal also reported that there was a blacksmith shop with power sharpeners at

the upper adit or B Level, and four 250-cu. ft. Ingersoll- Rand compressors driven by a 25-hp motor or short center belts at the lower adit or A Level (See Figure 4.9.4). Miners transported ore to the mill by an aerial tramway. A 10 x 20-inch jaw crusher crushed ore, and EMJ noted that "the crushed product [fell] upon a grizzly serving a 9 x 15-in. jaw crusher." The machinery for the mill was chosen based on its ability to be disassembled and moved up the steep mountain road. A camp, located at 10,500 feet, connected with the mine by a mountain road that terminated at 8,500 feet. Lumber to build the mill and other buildings was cut from mountain timber (DOI, BM 1938:568- 570, 572; EMJ, 19 December 1925:969-972; EMJ, 10 April 1926:605-606).

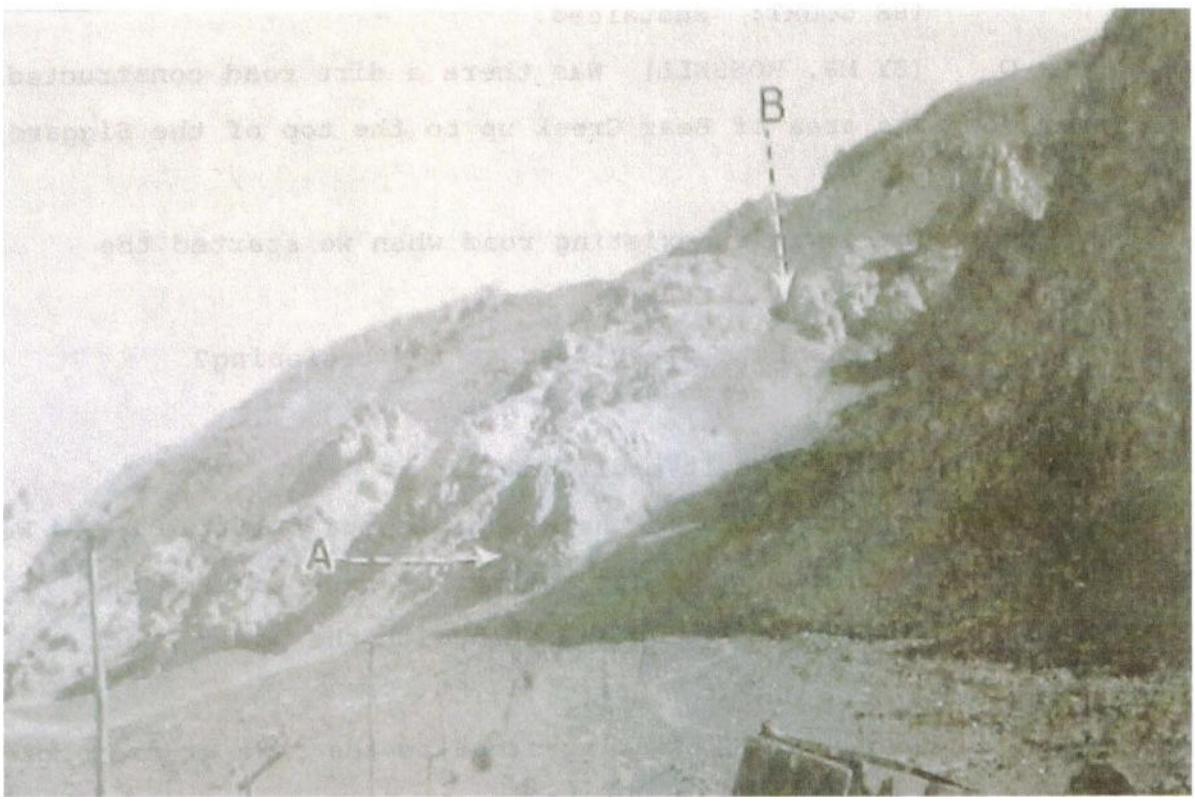

Figure 11.1.1 Outcrop of Tungsten deposit, showing upper and lower adits at B and A (Photograph from Engineering and Mining Journal, 10 April 1926:606).

For time, it seemed that the mine would operate for many years, but in November of 1926, heavy snows closed the mine. Tungsten Products Company considered building a camp and mill at a lower elevation and connecting the mine to the mill with an aerial tramway, but no such system was built under their ownership. In 1927, creditors of the Inyo Bank forced Tungsten Products Company into bankruptcy. The California Division of Mines noted that "between 1927 and 1936, the [Pine Creek] mine was idle except for a brief period in 1933 when it was operated by Herbert Sillinger" (Division of Mines, Department of Natural Resources, State of California [DOM, DNR, CA] 1956:23; Kurtak 1998:34).

In the mid-1930s, business and industry in the United States struggled with development during the depths of the Great Depression, but worries about a war in Europe led to increased prices for tungsten. Additionally, the use of ultraviolet light to illuminate fluorescent scheelite while prospecting resulted in more claims and reopening of mines. Promoters approached the Union Carbide Corporation between 1927 and 1935 to purchase Pine Creek Mine. The price of tungsten did not rise high enough to pique their interest until 1935, and by December of that year Union Carbide, through their subsidiary U.S. Vanadium Corporation, acquired Pine Creek Mine. U.S. Vanadium repaired and upgraded buildings, structures, and equipment necessary for the production of tungsten. They also addressed issues with mining in the High Sierra not previously overcome by other operators. This included constructing a new access road to the mine. Before roads were built, mules transported supplies. Pine Creek utilized George Brown, a Paiute, to transport materials necessary for the construction of power lines in 1937. He was a well-known "packer" used by several local mines to get equipment and supplies up the rough mountain side. Brown operated his packing business between 1930 and 1943. His "jumping off point" to the mines became known as Brown's Camp, which is located at the west end of Pine Creek Road. U.S. Vanadium completed a new mill with a 250-ton per day capacity at Pine Creek, but did not produce concentrates in 1937. Development of the mine and mill site continued over the next four years (DOI, BM 1938:568-570, 572; Kurtak 1998:38-41).

The Japanese invasion of China in 1937 led to fears that export of Chinese tungsten would end, which caused U.S. market prices to skyrocket and supplies to be scarce. The Minerals Yearbook 1938 described this as a "frantic demand" for the metal, and reported that "production in the United States was the largest of record, except for the war years, 1916-1918 ... many new domestic producers appear[ed] during 1937, new properties were prospected and developed, old mines reopen[ed], and old dumps were worked." In California the largest producer was still Atolia Mining Company in San Bernardino County, which shipped 329 short tons of the 511 tons of tungsten concentrates from scheelite produced in the state (DOI, BM 1938:568-570, 572; Ridge 1968:1534-1535).

Nevada was the largest producer of any state at this time (D01, BM 1938:568- 570, 572).

See Figure 11.1.2 On Next Page

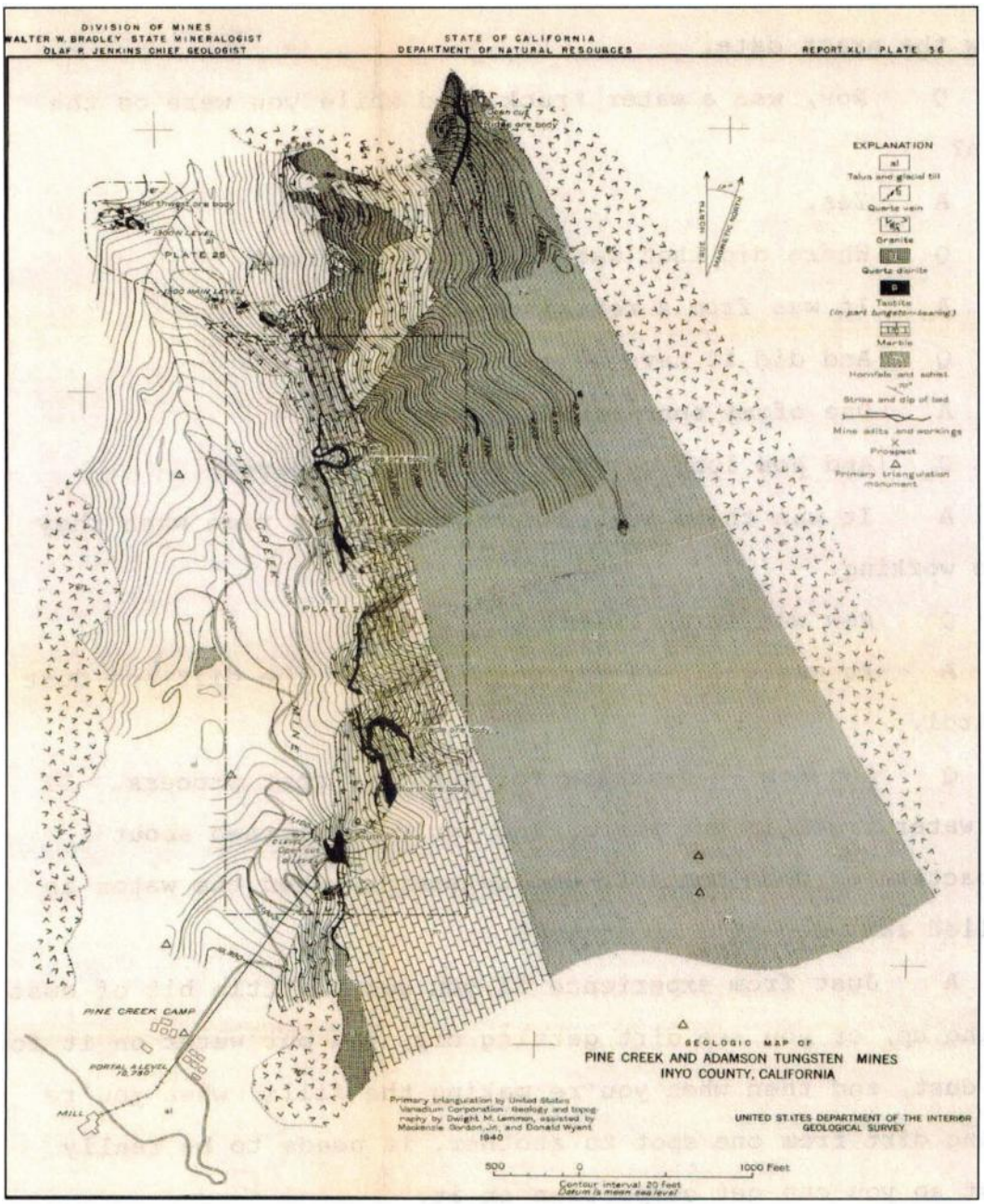

Figure 11.1.2. Map showing mine as it existed in 1940. Note Pine Creek Camp, Portal A and mill at lower left, at elevation 10,750 (State of California, Department of Natural Resources [SC,DNR], Report XLI, Plate 36, Geologic Map of Pine Creek and Adamson Tungsten Mines, Inyo County, California, 1940. California Geological Survey Library, Sacramento).

Tungsten Production During and After World War II (1939 - 1950)

The principal use of tungsten in 1940 was in manufacture of metal-cutting tools. Small quantities were needed for use in electric light and radio tube filaments, but the largest use, as noted by the Bureau of Mines, was "for military purposes, [where] tungsten was used as a core in armor-piercing bullets, as an erosion resistant liner in heavy ordnance, in armor plate, and in gun breeches" (DOI, BM 1941:615-622). Increased industrial activity caused by the beginning of World War II in Europe created a heavy demand for tungsten, and "universal armament activities in 1940 put further emphasis on the strategic nature of tungsten." Additionally, exports from China were diminished, and the bureau reported that "the search for domestic deposits of tungsten ores was greatly stimulated, and many small lots ranging from a few hundred pounds to several tons were produced from new or previously abandoned deposits." President Franklin D. Roosevelt (FDR) issued Proclamation No. 2413 regarding the export control of strategic products, which named several materials, including tungsten, as vital to defense and required export licenses. The United States government began to stockpile tungsten concentrates. Federal law fixed the price and sale of tungsten during World War II, and the bureau later stated, "the Bishop Tungsten area became as active as available manpower permitted." It added, "shipments of tungsten concentrates from domestic mines increased 24 percent from 1939 to a near all-time high of 5,319 short tons (60 percent W03) in 1940..." California's maximum shipment of tungsten concentrates was in 1943 at 3,871 short tons (DOI, BM 1940:617; FDR Library 2011: July 2nd, 1940; Ridge 1968:1534).

In the 1940s, U.S. Vanadium Corporation, as recorded by Paul Bateman of the US Geological Survey, mined "by means of 4 main levels, known as levels 250, A, C, and E, at elevations of 10,540; 10,070; and 11,370" (See Figure 5.9.08).

They operated a mill with a 350 or 500 ton regularly capacity at Pine Creek, and were constructing a mill with 1,200 to 1,300 ton regularly capacity at a new site 3,000 feet below the mine portal at the junction of Pine and Morgan Creeks to replace the old mill, which is the site of the study area for this report (DOI, BM 1943; EMJ, November 1941). A three section aerial tramway 11,000 feet long connected the mine to the new mill (Bateman 1945:1; DOI, BM 1941:615- 622; EMJ, November 1941:72). The EMJ described the process at Pine Creek in an article in November 1941:

Ore is hauled by a 5-ton electric storage-battery locomotive, in 10-car trains, using 3-ton Granby-type side-dump cars, to a crushing plant at the mine portal consisting of a 20-in. gyratory crusher set to crush to 4-in. size at rate of 160 tons per hour. Crushed ore is conveyed by a ... tramway ... with a capacity of 100 tons an hour, to the new mill ... The buckets from the tramway discharge into a lower tramway bin, where the ore was fed by a pan feeder to a Symons 51/2 ft. short-head crusher set to a 1/4 inch opening. This crushed ore is conveyed to four 1,200-ton circular steel storage bins over a Merrick weightometer for recording tonnage. The mill had four

sections, and "in each section the ore was fed to a 6x5-ft. March ball mill of the open-end type, in closed circuit with a 60-in. Akins classifier. The ore was ground to approximately 90 percent minus 60 mesh, and went to flotation machines at a pulp density of 25 percent solid (EMJ, November 1941:72).

Figure 11.1.3. Concentrating and chemical treatment plant of U.S. Vanadium Corp. at junction of Pine and Morgan Creeks, elevation 7,700 ft. (Photograph from *Engineering and Mining Journal,* November 1941: 72.) This photograph, looking southwest, was taken from Morgan Creek Road leading to the upper mining area.

Furthermore, the Bureau of Mines stated that "large tonnages of complex tungsten-molybdenum ore [were] blocked out, and a suitable method of separation [was] developed involving selective flotation, with chemical treatment of the flotation concentrates to raise the tungsten in the final product to the 60 percent range." A chemical plant on Pine Creek recovered tungsten with the use of continuous pressure autoclaves treating tungsten with steam and sodium carbonate to separate

from the concentrates soluble sodium tungstate, which underwent a purification process to produce a marketable grade synthetic scheelite. The company treated concentrates from its own mine and also purchased low-grade flotation concentrates from other local mines including Brownstone, Tungstar, Adamson, and Hanging Valley mines. By this time Pine Creek was the nation's largest mill with the largest deposits in the world (DOI, BM 1941:615-622; EMJ, November 1941:72; Kurtak 1998:154-173; Pete Belec, August 12, 2014).

The federal government cancelled contracts to purchase tungsten concentrates at the end of World War II, and the price of tungsten declined "once again forcing curtailment or abandonment of most of the Bishop area properties." In 1945, Pine Creek did not produce any ore, but the Bureau of Mines noted that the "chemical plant ... was operated part of January and from late July through December; as a consequence, production of concentrates was only half that in 1944." Pine Creek developed the Zero Level Tunnel at the end of the war in an effort to locate more ore bodies. It was drilled 1,500 feet below the A Level adit and intersected with the main ore body 6,500 feet into the mountain directly below A Level. The new adit also improved mining operations during inclement weather caused by heavy snows, because it became the main hauling level for ore and eliminated the upper portions of the tram. Other improvements to Pine Creek included the addition of a rotary nodulizing unit for scheelite concentrate to the treatment plant (DOI, BM 1947:660-665; Kurtak 1998:90-91; Ridge 1968:1534).

See Figure 11.1.4 On Next Page

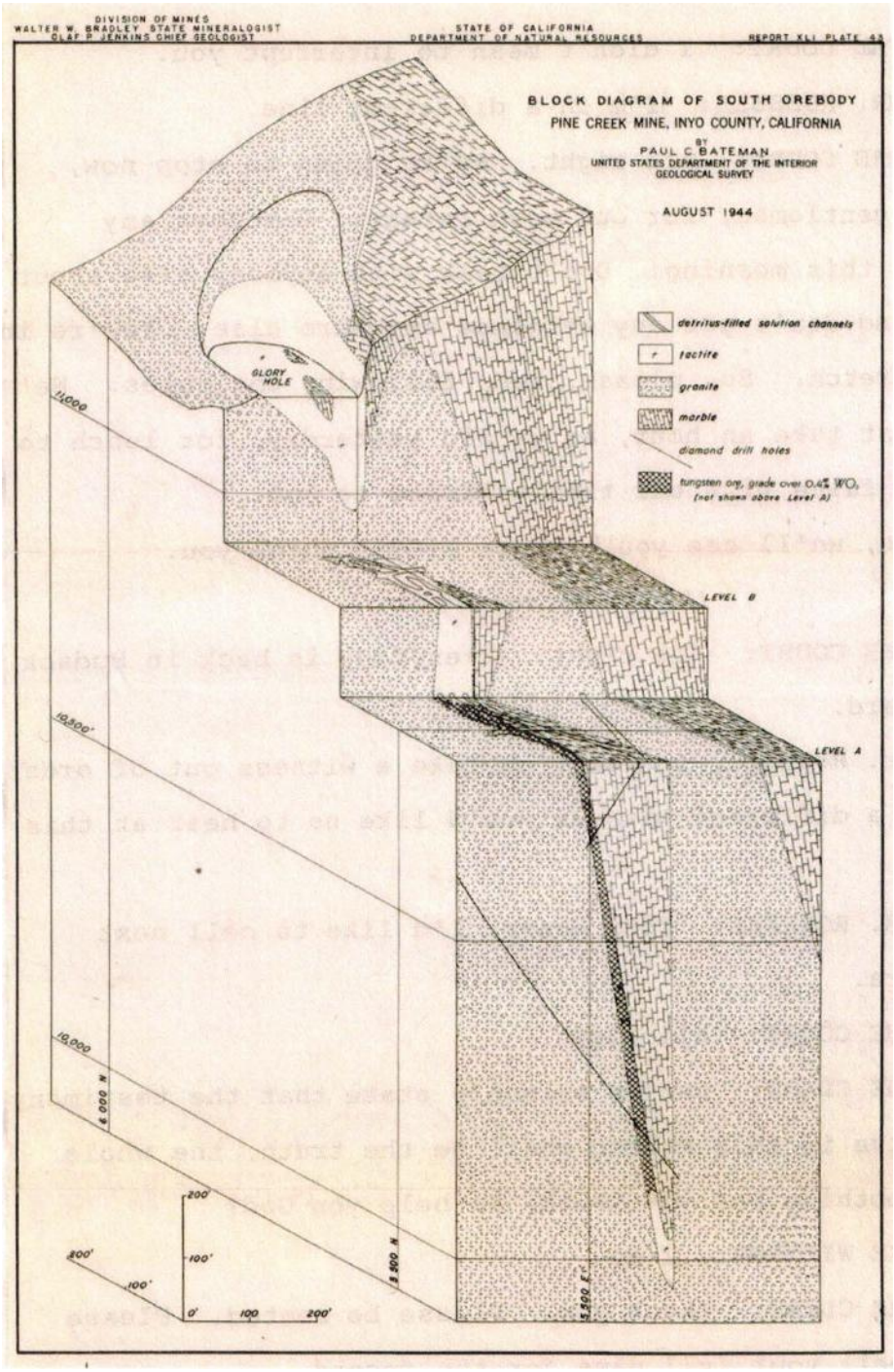

Figure 11.1.4. South Orebody showing mining levels and glory hole (State of California, Department of Natural Resources, Report XLI, Plate 43, Block Diagram of South Orebody, Pine Creek Mine Inyo County, California, August 1944. California Geological Survey Library, Sacramento) (SC, DNR 1944a).

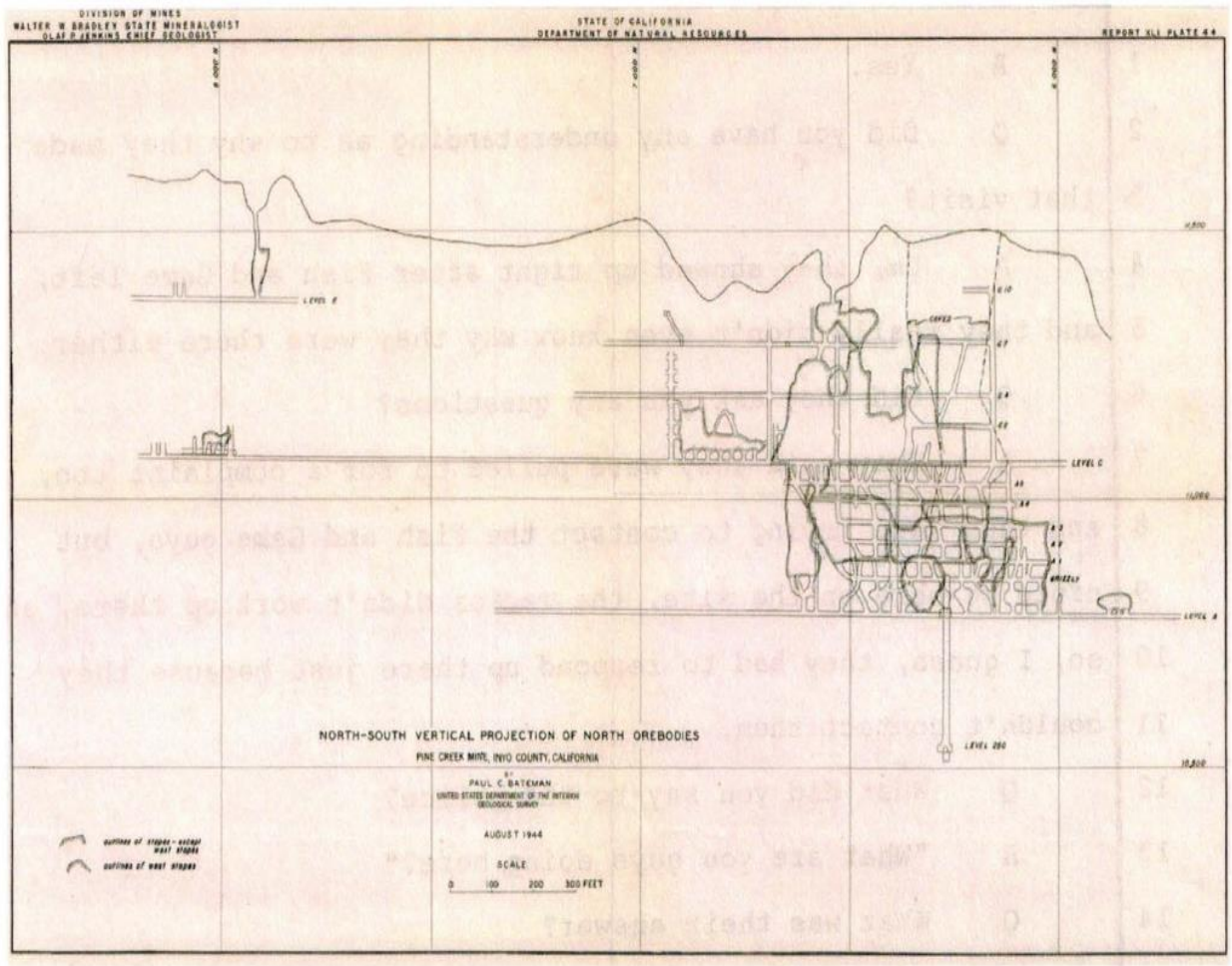

Figure 11.1.5. North-South Vertical Projection of North Ore bodies, showing mining levels as of 1944 (State of California, Department of Natural Resources, Report XLI, Plate 44, North-South Vertical Projection of North Ore bodies, Pine Creek Mine Inyo County, California, August 1944. California Geological Survey Library, Sacramento) (SC, DNR 1944b).

Korean War and Government Stockpile Program (1950 —1958)

In June of 1950, North Korea invaded South Korea because of a dispute over the boundary at the 38th parallel between the two countries. The United States sent troops to assist South Korea, and the federal government enacted the Defense Production Act that placed the United States on emergency military status. The hostilities in Korea, as with previous wars, substantially increased demand for tungsten, and, as the Bureau of Mines noted in its Mineral Yearbook 1950, "international bidding for tungsten concentrates forces the price up to a level higher than at any time since World War II." Additionally, Chinese exports dwindled, and a shortage of tungsten developed. In April of 1951, the General Services Administration (GSA) started a buying program for tungsten to satisfy demand. They

announced that the government would purchase tungsten concentrates for five years at $65 per unit (one unit equals 20 Ibs), or until 3,000,000 units totaling 60,000,000 pounds was stockpiled. California produced the most tungsten followed by North Carolina and Nevada. Between 1900 and 1950,

California produced 39,429 short tons of tungsten concentrates, 30.17 percent of the national total for that period. Nevada, Colorado and Idaho were also important producers with Nevada close behind California at 38,566 short tons (DOI, BM 1953; EMJ, February 1951:97; EMJ, December 1951:131; Kurtak 1998:106).

Figure 11.1.6. Largest US Producer of tungsten, United States Vanadium Company's Pine Creek mine, Bishop California, expands production to meet defense demands. Mill appears above, road leads up to Zero Tunnel, at 9,300 ft. elevation (Photograph Engineering and Mining Journal, May 1951:76).

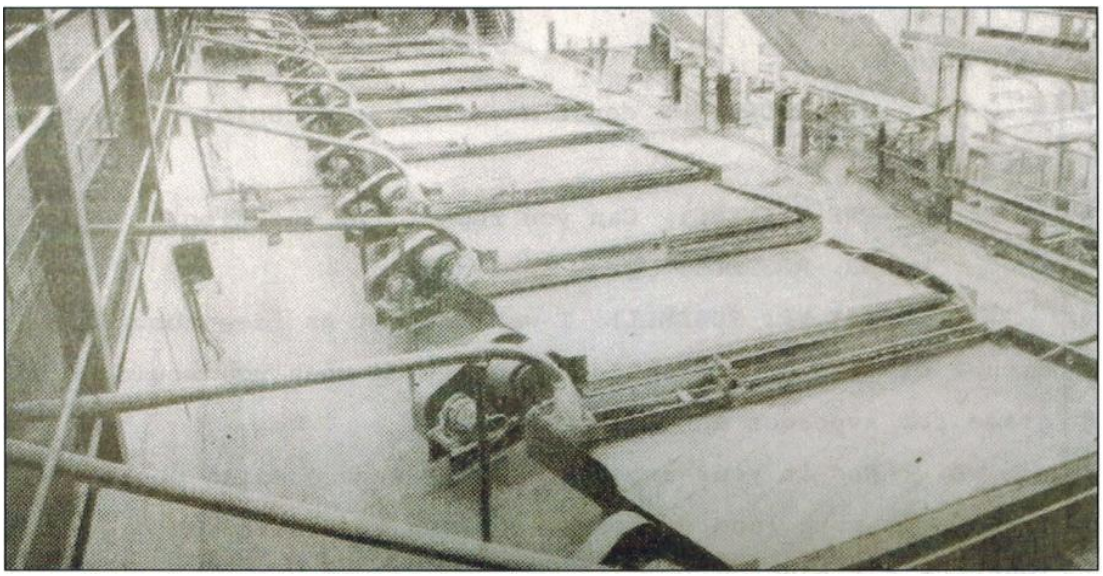

Figure 11.1.7. Tables separate coarse scheelite for regrinding, and make high-grade concentrate for shipment at Pine Creek (Photograph from Engineering and Mining Journal, May 1951:83).

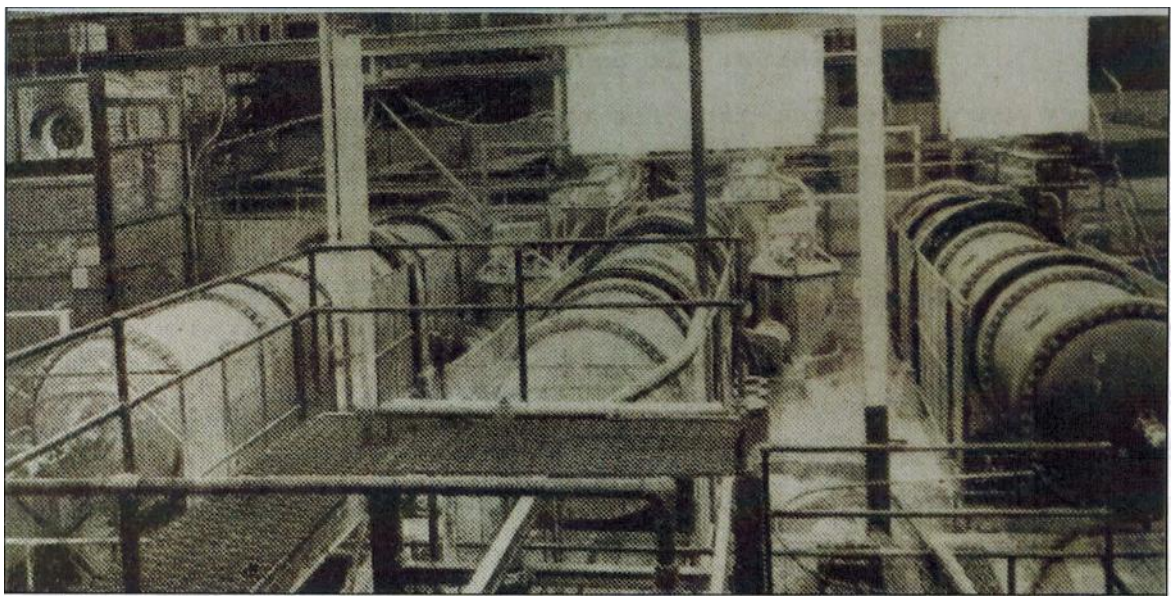

Figure 11.1.8. Pressure digesters at the Chemical Plant at Pine Creek helped purify tungsten and molybdenum products from concentrates. (Photograph from *Engineering and Mining Journal,* May 1951:83).

Pine Creek increased operations by 70 percent in 1949 producing and processing ore from its own mine and handling materials from other mines or sources. In 1950, Pine Creek was in first place amongst United States tungsten producers. An article in the EMJ described the existing machinery and buildings at the mine:

Surface plant at Zero Portal: office building, containing engineering office, first-aid room, lamp room, wash and dry room, time office, shifters office, timber framing shed, electrical supply warehouse, oil storage.

Primary Crushing Plant at Zero Portal: cars dumped with Differential Steel Car Co. rotary tipple into 150-ton coarse ore bin. Ore goes to 4 x 16 ft. Sheridan grizzly powered by 50-hp motor, which feeds 36 x 48-in. Traylor Type HB jaw crusher driven by 150-hp motor. Plus 3-in. crusher product fed to 1,000-ton storage bin at head of aerial tram loading station by a 30-in. 185-ft. conveyor belt. Tram buckets loaded by 30-in. Link-Belt heavy-duty apron feeder driven by 15-hp 56-rpm gear motors.

Aerial Tram: operates between primary and secondary crusher plants; is 4,153 ft. long; supported by five wooden towers. Twenty six 20-cu ft. buckets ride system... [EMJ, May 1951:77].

The 1,000-ton mill and chemical plant, built in 1942, produced copper concentrates, molybdenum concentrate, a second molybdenum product, and a tungsten product using floatation and chemical treatments. The EMJ reported, "the process includes: secondary crushing of the ore at the foot of the aerial tram; fine grinding in a single stage; bulk sulphide floatation; separation of copper and molybdenum by floatation; floatation of scheelite with some powellite; chemical separation and purification of the tungsten and molybdenum ..." (Figure 5.9.12).

See Figure 11.1.9. On Next Page

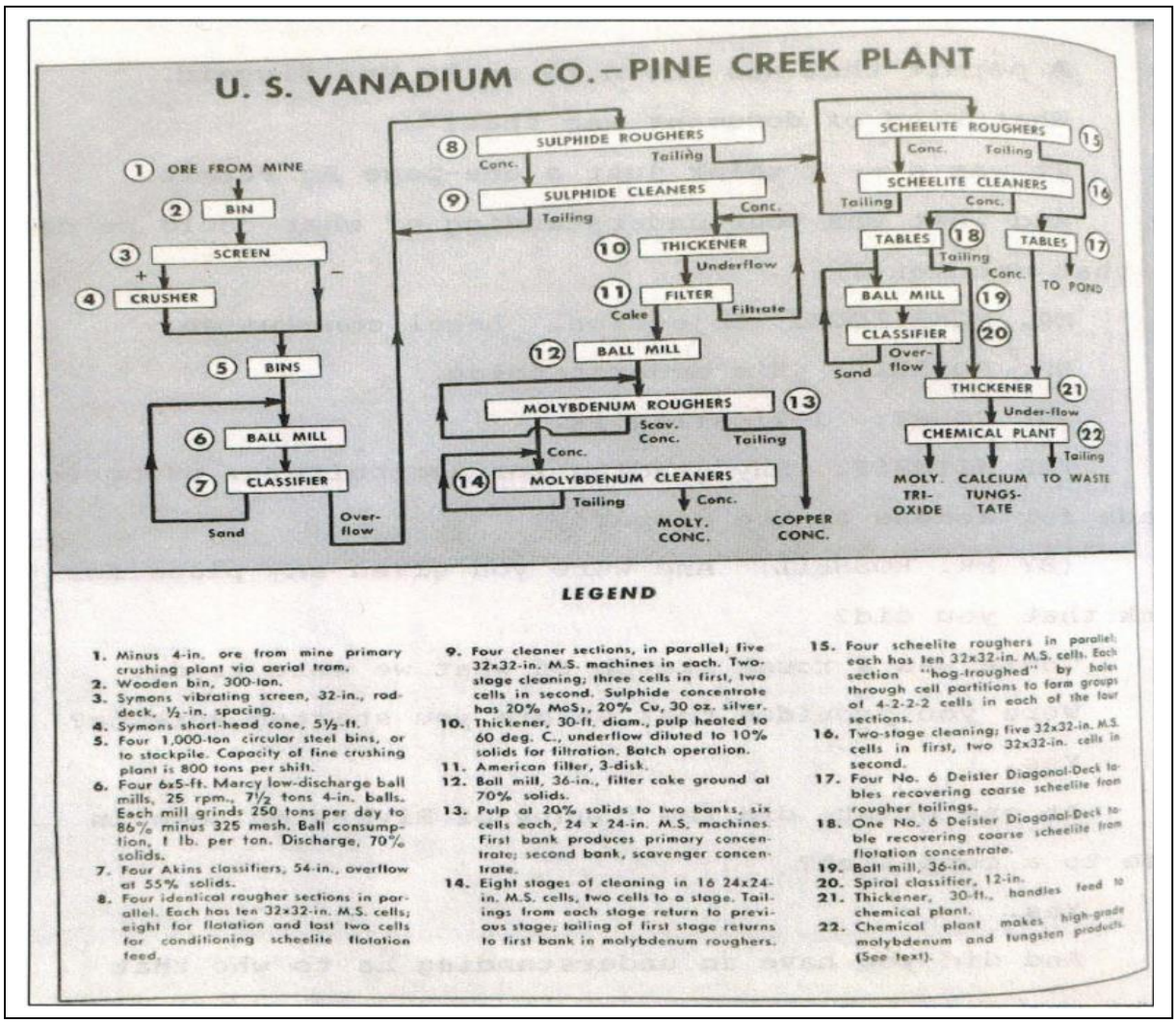

Figure 11.1.9. Mill flowsheet from Engineering and Mining Journal, May 1951:82

By May of 1951, efforts at Pine Creek to increase production included enlarging Zero Tunnel from eight feet to twelve feet, driving a 1,500-ft. raise and ore pass to connect Zero Tunnel with older workings at higher elevations, mining upper workings (despite the difficulty to get ore down), and expanding the mill and chemical plant capacities. A separate crushing, conveying, and sampling plant were constructed at the Pine Creek mill site to process ores purchased from other mines. U.S. Vanadium hired vigorously to support increased production activities. Some of the employees were members of the Paiute and Shoshone tribes that lived in the local area. The recruitment program doubled the number of employees, and created a housing shortage. The company built more houses at Rovana and Scheelite villages to accommodate new employees.

Rovana Village was located near the mouth of Pine Creek at 5,000 feet in elevation; Scheelite Village was located near the mill. An avalanche in March of 1952 destroyed several houses in the Morgan Creek area, tore out a power substation and terminal for the aerial tramway, and crashed into the mill. The EMJ reported that "15 month-old Mike Holmes, son of Tom Holmes, mine superintendent, was buried under 18 ft. of snow and debris when an avalanche destroyed the Holmes' house. Rescue workers found the boy two hours later unharmed and kept warm by two pet dachshunds." Operations at the mine stopped for only a month while everything was repaired. In 1955, the company completed the 1,500 ft. raise between adits (EMJ, May 1951:76-83; EMJ, May 1952:138; EMJ, February 1955:99; Kurtak 1998:107-11, 120-121; Oakland Tribune, 11 July 1976, 12D).

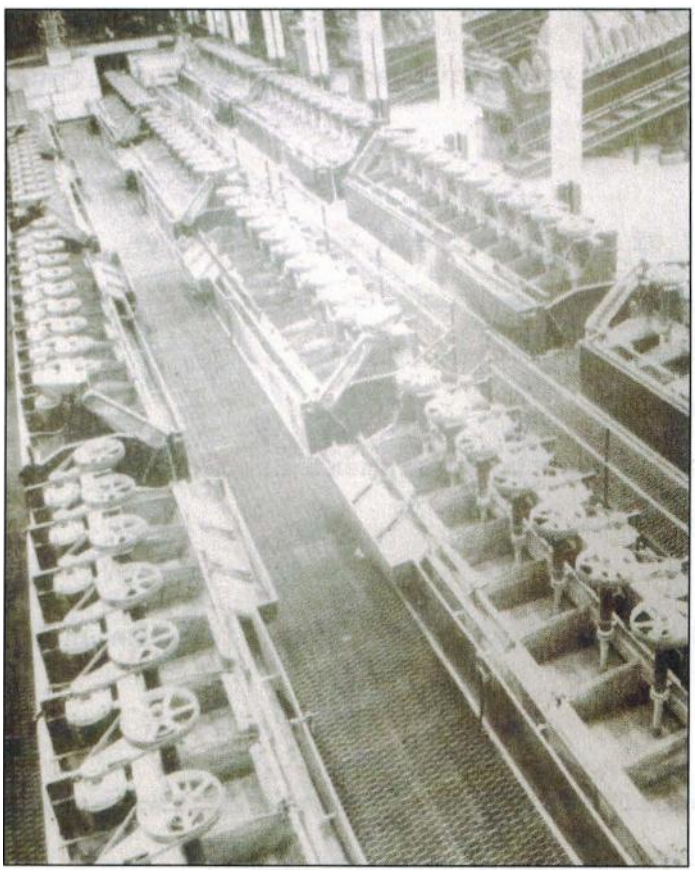

Figure 11.1.10. Flotation Section at Pine Creek uses M.S. machines, makes copper, molybdenum, and scheelite concentrate (Photograph from Engineering and Mining Journal, May 1951:83).

The best production year for tungsten in the United States was 1955, but in June of 1956, the federal government reached its stockpile goals and ended its buying program in December of that year. Pine Creek was the only mine operating in the Bishop area at the end of 1957 (Kurtak 1998:107-11; Ridge 1968:1534).

Vietnam War (1958 - 1975)

Tungsten production and demand continued to fall through 1959, and only two mines produced tungsten in the United States in 1958 and 1959 -- Pine Creek Mine in California and Climax Molybdenum Mine in Colorado. The tungsten market began to recover in 1960, largely because of the United States involvement in the Vietnam War. Asian imports declined and production in the United States accounted for 70 percent of domestic consumption. The development of new fabrication techniques and tools including arc-casting, electron-beam welders, and electron gun and plasma-jet spraying devices created additional uses for tungsten, and also aided domestic production and demand. However, fora period between December 1961 and September 1963, the tungsten market seemed to be in decline. Russia and China flooded the world market with tungsten, which caused a decrease in prices that undermined American producers. Prices dropped from $24-$26 a unit to $15-$16 a unit within two months, and by December 1962, prices fell to $8 per unit with an additional duty of $7.93 placed on domestic buyers. Concerns over whether the federal government would sell its tungsten reserves further depressed domestic market prices, but Russian and Chinese exports to Europe stopped, which allowed prices to recover and the outlook for domestic producers seem brighter. Again, tungsten was produced by only two mines in 1963, Pine Creek and Climax Molybdenum. Another supply shortage in 1964 caused prices and production to spike, but prices and demand stabilized between 1965 and 1968. Tungsten demand was stimulated by the war in Vietnam and the market for snow-tire studs, the federal government's stockpile sales policy, the absence of exports from China, and industrial activity in the US, Western Europe, and Japan (EMJ, February 1959:152; EMJ, February 1960:139;, EMJ, January 1962:123;EMJ February 1962:113; EMJ, February 1963:133; EMJ, February 1964:136-137; EMJ, March 1968:139; Kurtak 1998:111).

During this time, Pine Creek Tungsten Mine was, according to the EMJ, "the largest and most stable operation in the district." Pine Creek did well despite the slump in the early 1960s caused by the flood of tungsten from China and Russia, because of the high demand for ammonium paratungstate (APT) produced from a process unique to the company. Ray Kurtak discovered the process working in the metallurgical laboratory at Pine Creek in the late 1950s. The process for APT was implemented in 1959 by adding two steps to Pine Creek's milling procedure (See Figure 5.9.14), and was reported by the EMJ as the "first direct method for preparing pure tungstate from scheelite ore sources." The building of a full-scale APT plant at a site adjacent to the mill in Pine Creek Canyon was done in 1959 and took eight months to complete, and the first product was shipped in January of 1960. The APT plant was designed by chemical engineer Lew Twichell in New York, and final design and construction was completed by Bob Klotzback, Carl Jealous, and Mal Twichell. According to Kurtak, "The success of the product, like the earlier scheelite process, put the company into the forefront of the U.S. tungsten market ... In honor of this pioneering work, Union Carbide received the K.C. Li award ... in recognition of

contributions that advanced tungsten technology" (EMJ, October 1956:103,135; Kurtak 1998:132).

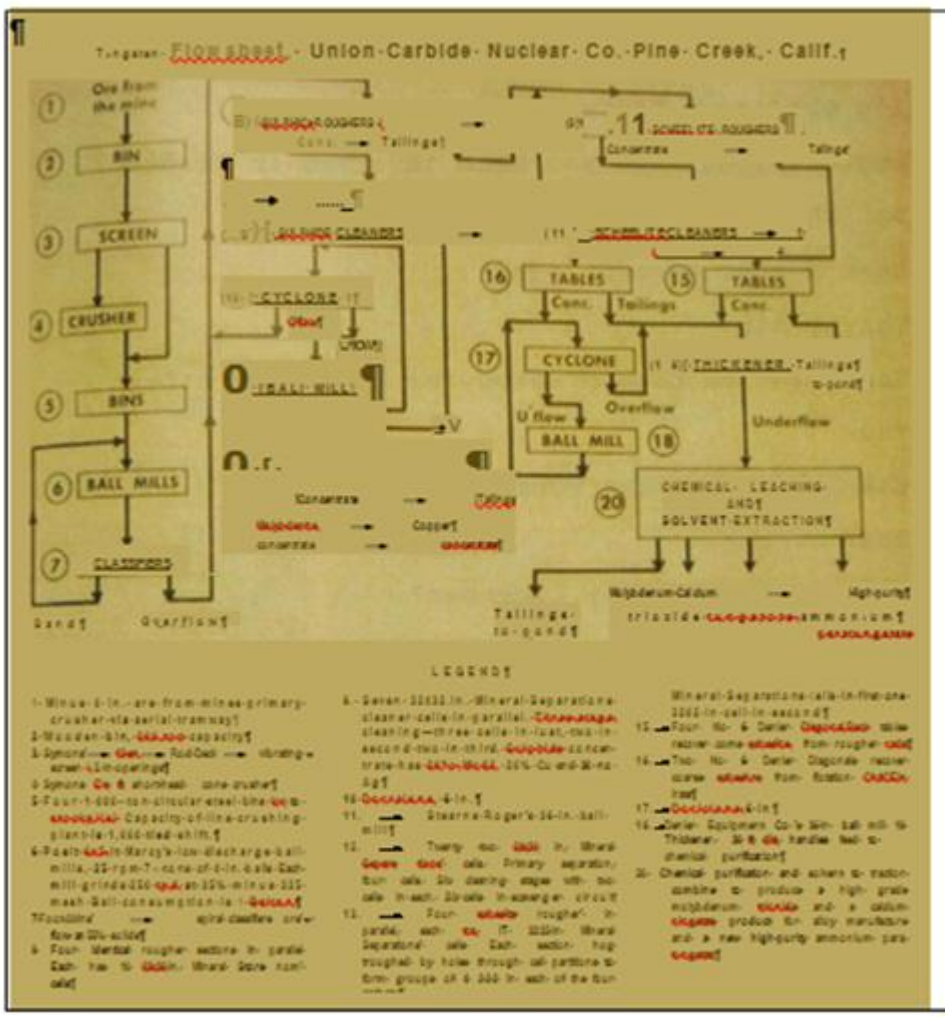

Figure 11.1.11. Mill flowsheet from Engineering and Mining Journal, October 1959:103

Ore grades dropped were depleted, so the company made plans to drill below Zero Tunnel in 1958 to see what ore, if any, extended further down. In the fall of 1960, miners started cutting the new Easy Go tunnel, which got its name for the labor saving improvements it created. The first 5,000 feet of the Easy Go were relatively simple to dig, but after a long weekend a cave-in occurred at the back of the tunnel, which left a large void and mud and water streaming everywhere. To correct the situation and move forward with the Easy Go, Kurtak noted that, a pilot tunnel was driven for some 200 feet around the bad ground and timbered every foot of the way. Once the pilot tunnel had reached solid ground beyond, miners worked back through the weak ground, trying to stabilize it. Men worked in diver's wet suits as protection from the ice-cold water flowing everywhere.

Concrete and chemical grouts were used with no avail. Stabilization was finally achieved through the use of steel I-beams set on three-foot centers. Wooden lagging was installed between the sets to prevent rock from coming in at the sides (Kurtak 1998:136).

Further drilling of the Easy Go drained water out of Zero tunnel, because Easy Go intercepted with the fracture system that conveyed water through the mountain. As Kurtak explained, "At peak runoff, up to 8,000 gallons of water per minute would flow from the Easy Go portal, but the engineers had planned ahead for this, using knowledge gained from Zero level experience. A drainage ditch was excavated to handle the flow as the tunnel advanced." Once finished, miners delivered ore directly to the mill from Easy Go without the use of the aerial tramway, and they no longer needed to commute up the mountain. John Ridge, editor of Ore Deposits in the United States, reported in 1966 that, "the new Easygoing [sic] Tunnel has intercepted an ore body at an elevation of 8,100 feet. From elevation 8,100 feet to about 9,200 feet, the known part of this ore body consists of tactite confined in a south-plunging trough on the quartz-monozite contact south of and below the Main ore body." The company completed the Easy Go tunnel in 1970; it was two miles long and 60 feet below the ore body.

Kurtak noted that in order "to mine the ore, two raises -- one a manway and the other for ore, were driven 1,300 feet up to the Zero Level. The connection was excellent, coming within two feet. An ore zone extending vertically for some 3,400 vertical feet could now be accessed through one tunnel." With the completion of Easy Go, the aerial tramway shut down. Zero Level facilities were abandoned and then permanently removed in the 1980s (Kurtak 1998:133-136; Ridge 1968:1534-1535).

The Decline and Closure of the Mine (1975 — 1990)

With a new process for creating marketable tungsten products out of low grade concentrates and completion of the Easy Go Tunnel, the decade of the 1970s started on a golden note. However, by 1975, the future did not look so promising for Pine Creek Mine. Kurtak stated that Pine Creek's "massive tactite ore bodies had 'bottomed out' after extending three mining levels and nearly 3,400 feet below the original discovery point." He added that "there were no indications of ore beneath the Easy Go level and high-grade rock at the north end of the mine, used to sweeten the lower grade ores, was running out." The company tried to locate additional ore bodies in 1977 and 1983, but was unsuccessful. Tungsten prices hit a record high of $165 per short ton unit in May of 1977. This influenced Union Carbide to return to mining places once deserted for safety reasons, which eventually caused caving in the depths of the mine. It became a serious problem by 1978, noted Kurtak, who stated "... the caving began to threaten the integrity of a major raise connecting Zero and A Levels. In an effort to stabilize the caving, a raise was driven to the surface above A Level. Then over 100,000 tons of surface-waste rock were dumped down the raise ... which ... was ... 1,400 feet deep." The company stabilized caving in the mine, but high grade ore was lost. In the 1980s, China returned to producing

tungsten and flooded the market with ore. Additionally, demand for carbide bits went down, because exploration subsided in the oil and mining businesses. These factors led to another collapse of the tungsten market. Decreases in ore grades coupled with an increase in operational costs and the market collapse eventually caused the closure of Pine Creek. Union Carbide closed the mine in 1982, and sold its mining assets in 1986 to several former executives. The new owners formed Strategic Minerals Corporation or Stratcor, which later became U.S. Tungsten Corporation, and reopened Pine Creek Mine for a final time in 1988. However, mining operations ceased in 1990 because of a depressed market. The mill continued to process stockpiled ore until it closed in 1994 (EMJ, March 1978:158-160; Kurtak 1998:146-153).

Hydroelectric Development Related to the Project

An independent, surface 250kW conduit hydroelectric facility is already in operation at Pine Creek Mine downstream of the Project. This Project would use the same water as the existing facility without modifications or alteration to the water conveyance existing Water Discharge System. No environmental impacts from actual construction of the Project are therefore anticipated. The existing facility, known to FERC as "No. P-13163 Pine Creek Mine Water Discharge System Sites 1-2," was exempted from License by FERC order on March 2, 2011.

11.3 Cultural Resources Investigations within the APE

This section summarizes information on archaeological sites, historical structures, and traditional cultural properties obtained from DAHP records and cultural resource studies conducted in the vicinity of the Project.

No prehistoric archaeological sites have been recorded at DAHP for properties within the APE or in the Project vicinity. There is no known history of occupation of the Project area, and there have been no villages found. The Project area is remote and rugged, and it is not likely that anadromous fish provided a food supply in the area. (JRP, 2015)

There have been several studies of the Round Valley area conducted by the California Department of Transportation (Caltrans) in relation to State Route 395. Some of the earlier work was by Cook (1974) for the initial archaeological survey, and Warren and Hearne (1974) for excavation of Sites CA-INY-1013, INY-1014, INY-1015, INY-1017, INY-1020, and INY-1024 all of which had late period affiliation. Warren and Hearne especially were aware of the transitional nature of these sites and discussed the historic era artifacts and/or historic structural components as metal fragments (including cast iron), cartridges, wire and cut nails, tinned canisters, glass and ceramic fragments, other historic-era items, houses, and aboriginal items including ceramics and beads. They used four measurements to seriate the sites as a method for chronological ordering, with the sites containing the most historic debris being postulated as the most recent. Warren and Hearne (1974:8) recognized that

"these sites appear to illustrate the change from prehistoric to historic occupation," and provided some testable observations. In the historic era, there was "(1) a more rapid decline in the occurrence of flaked stone than in milling stones, and (2) a more rapid decline in projectile points than either scrapers or flakes" (Warren and Hearne, 1974:11).

They continued to discuss the changes to Paiute lifestyles that go beyond the need for discussion in this study, but what is important about the archaeological sites in this general Project area, is that virtually all of them contain historic constituents, indicating that the people continued to use the places of their ancestors. Among the informants for these studies was George Brown.

Archaeology in the immediate project area has been relatively limited compared to other areas of the Mono Basin and Owens Valley. Research by Eerkins and King (2002) and Basgall and Giambastiani (1995) comprise the major site analyses in the area, with the 2012 study by Basgall and Delacorte making the most comprehensive look at the region to date. Basgall and Delacorte (2012) conclude that there are a substantial number of Newberry age sites (about 3500- 1500 Before Present [BP]) in the Project area, and a greater number than found further south. Additional prehistoric background is also summarized in that report (Basgall and Delacorte, 2012).

11.3.1 Historic Properties

The Project, during construction and later during operation, will have no impact on any surface improvements at the mine. Specifically, no buildings will be affected by the Project during construction or operations.

The existing structures of the mine including the Easy Go Adit were primarily developed during and after World War II and are located at an elevation of 8,063 feet. Pine Creek Mine is not currently operating and many of the primary buildings at the mill site have been demolished. There are some support buildings and structures, mill equipment, and mine adits existing at the mill site. Additionally, some of the aerial tramway towers and sections of road remain along the mountain side.

See Figure 11.3.1 On Next Page

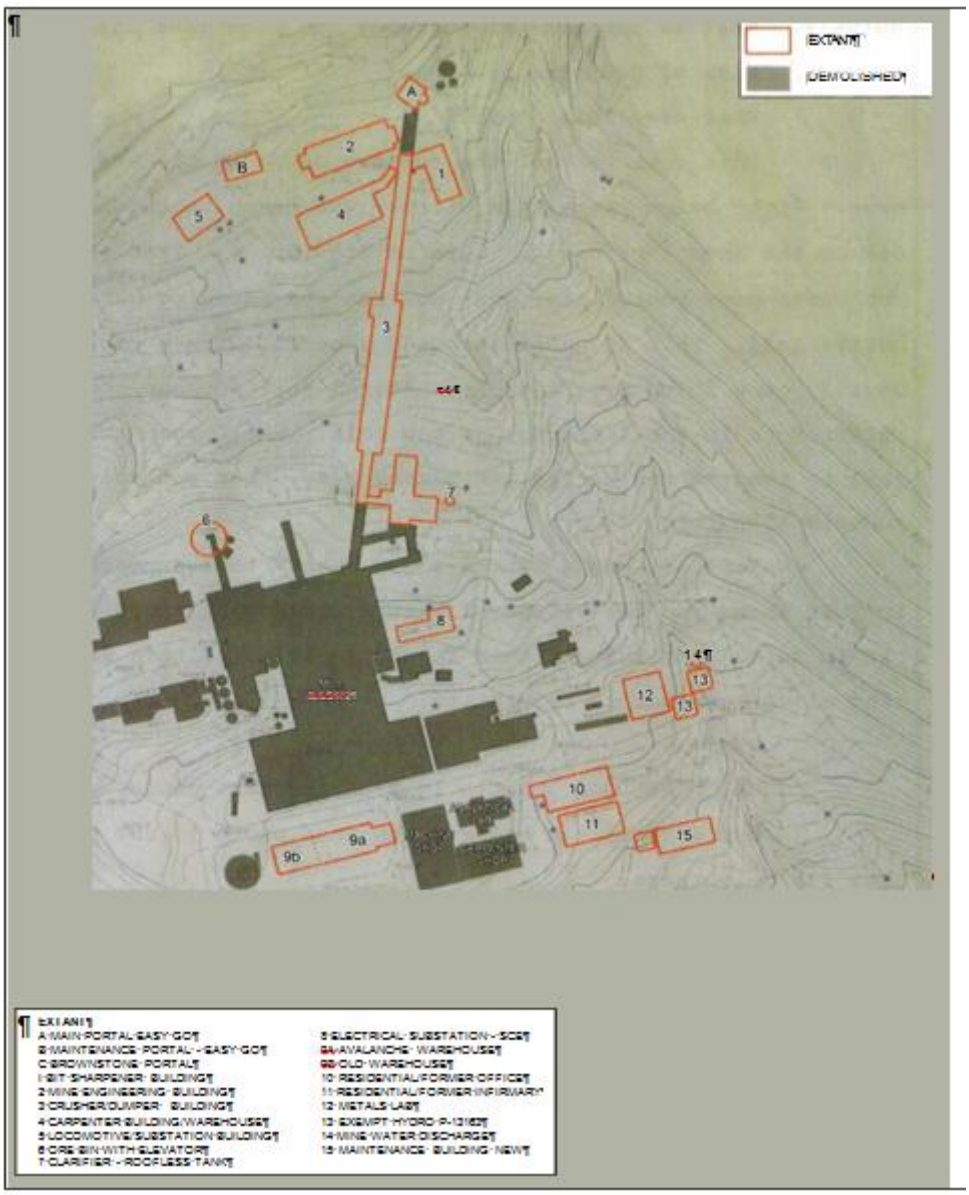

Figure 11.3.1. Mill Site near Easy-Go showing extant and demolished buildings (Base map, "Pine Creek Mine, Inyo County, California, Property Map, " no date; provided by Pine Creek Mine)

Under NRHP Criteria A or CRHR Criteria 1, Pine Creek Tungsten Mine appears to meet the criteria for listing in the National Register and the California Register under the themes of invention and science for the discovery of the ammonium paratungstate (APT) process, which created marketable tungsten products out of low grade concentrates. This process was unique to Pine Creek for several years, and then became a practice shared with other Tungsten mines worldwide. Pine Creek processed ore from other mines for many years following the implementation of the APT process. This combined with the Korean and Vietnam Wars made Pine Creek the largest producer and supplier of tungsten. The success of the mine was closely tied with war as tungsten was a strategic metal.

Under NRHP Criterion B or CRHR Criterion 2, this property is significant for its association with Ray Kurtak, the metallurgical engineer who discovered the process for APT unique to Pine Creek in the late 1950s working in the metallurgical laboratory (Building No. 12). The process for APT was implemented in 1959 by adding two steps to Pine Creek's milling procedure, and was reported by the EMJ as the "first direct method for preparing pure tungstate from scheelite ore sources." The building of a full-scale APT plant at a site adjacent to the mill (now demolished) was done in 1959 and took eight months to complete, and the first product was shipped in January of 1960. As noted above by Ray Kurtak's son, a mining historian, "The success of the product ... put the company into the forefront of the U.S. tungsten market ... In honor of this pioneering work, Union Carbide received the K.C. Li award ... in recognition of contributions that advanced tungsten technology" (EMJ, October 1956:103,135; Kurtak 1998:132). It is this process that imbues Building No. 12 with its historical significance.

Neither this property nor any of its individual elements is significant as an important example of a type, period, or method of construction, and thus does not meet the standard under NRHP Criterion C or CRHR Criterion 3. Buildings surveyed at Pine Creek Mine are simple, modern industrial buildings, often of a "Bulter" or manufactured type, quickly assembled, and primarily constructed of steel framing clad in corrugated metal sheeting. Buildings with distinct functions like the Crusher/Dumper Building and Ore Bin may have been uniquely designed in terms of their form for this site, but are not significant to the history of mining or Pine Creek Mine and were built after the period of significance in 1959-1960.

Under NRHP Criterion D or CRHR Criterion 4, this property is not a significant or likely source of important information about historic construction materials, technologies, and mining or milling processes. Buildings of this type and style, mining tungsten, and the process for APT are all well documented. As described in the previous archaeological section, the Project area as delineated in Figure A1, Map 2 does not retain any archaeological deposits that might be eligible under Criterion D. No cultural deposits were observed in any areas inspected.

Building No. 12, the Metals Lab, is directly associated with Ray Kurtak and his work on the APT process, and as such is individually eligible for listing in the NRHP under

Criteria A and B and the CRHR under Criteria 1 and 2, and the logical period of significance under both Criterion A and B would be 1959-1960, between the time Ray Kurtak developed and Pine Creek Mine adopted the APT process. This report has been prepared to provide an archaeological and historic context for considering

Pine Creek Mine's eligibility for listing in the National Register of Historic Places. As the historic context discussed, Pine Creek Tungsten Mine located near Bishop in lnyo County, California was discovered in 1916 at an elevation of 11,300 feet in the Sierra Nevada. The mine underwent expansion, development, and ownership changes over the next seventy years, and its success peaked during the Vietnam era. The mill site at 8,000 feet was developed between 1942, when it was moved from the original location at 11,000 feet, and 1970, when the Easy Go Tunnel was completed. The report concludes that one building, Building 12, is recommended as individually eligible for the NRHP, but that the mine itself no longer retains sufficient integrity to be considered eligible for any register. Additionally, no archaeological deposits, features, or sites were identified in the Pine Creek Mine project area, and no Native American concerns were identified.

Building 12, as the only resource evaluated as eligible for the NRHP, is located well outside the project APE and FERC boundary, and no project effects have been identified. As such, the results of identification and evaluation suggest that there are no historic properties affected (36 CFR 800.4(d)(1).

11.3.2 Traditional Cultural Properties

Cultural resources include prehistoric and historic-period archaeological sites, historic structures, and traditional cultural properties (TCPs). The Project does not involve any such properties because it lies underground. Nor will the Project affect any structures on the surface of the mine property. During the prior application period, a cultural resources study was required. Applicant believes that because cultural resources will not be involved in or affected by construction or operation of the Project, TCPs are irrelevant to this proposal.

11.4 Project Effects on Cultural and Tribal Resources

The Project, during construction and later during operation, will have no impact on any surface improvements at the mine. Specifically, no buildings will be affected by the Project. One cultural resource (Building No. 12) identified in the APE was evaluated as eligible for listing on the NRHP. However, the Project O&M will not affect the historic property or TCPs. The Cultural Resources Inventory and Evaluation Report, developed as part of the cultural resources study, was e-filed to FERC on July 15, 2015.

11.5 Applicant-proposed Measures

No environmental measures directly relating to cultural and tribal resources are proposed, and none have been recommended by any resource agency or interested party.

If previously unidentified cultural resources are discovered during the course of maintaining project works or other facilities at the Project, Pine Creek shall stop all land-disturbing activities in the vicinity of the resource and consult with tribes, agencies, and the SHPO to determine the need for any cultural resource studies or measures. If no studies or measures are needed, Pine Creek shall file with FERC documentation of its consultation with the SHPO.

If a discovered cultural resource is determined to be eligible for listing on the NRHP, Pine Creek shall file with FERC a Historic Properties Management Plan (HPMP) prepared by a qualified cultural resource specialist. In developing the HPMP, Pine Creek will use the Advisory Council on Historic Preservation and the FERC's Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, dated May 20, 2002. The HPMP shall include the following items: (1) a description of each discovered property, indicating whether it is listed in or eligible to be listed in the National Register; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding or mitigating adverse effects; (4) documentation of consultation; and (5) a schedule for implementing mitigation and conducting additional studies.

11.6 Environmental Effects of Applicant-proposed Measures

No environmental effects have been identified and none are expected.

See Attachment A On Next Page

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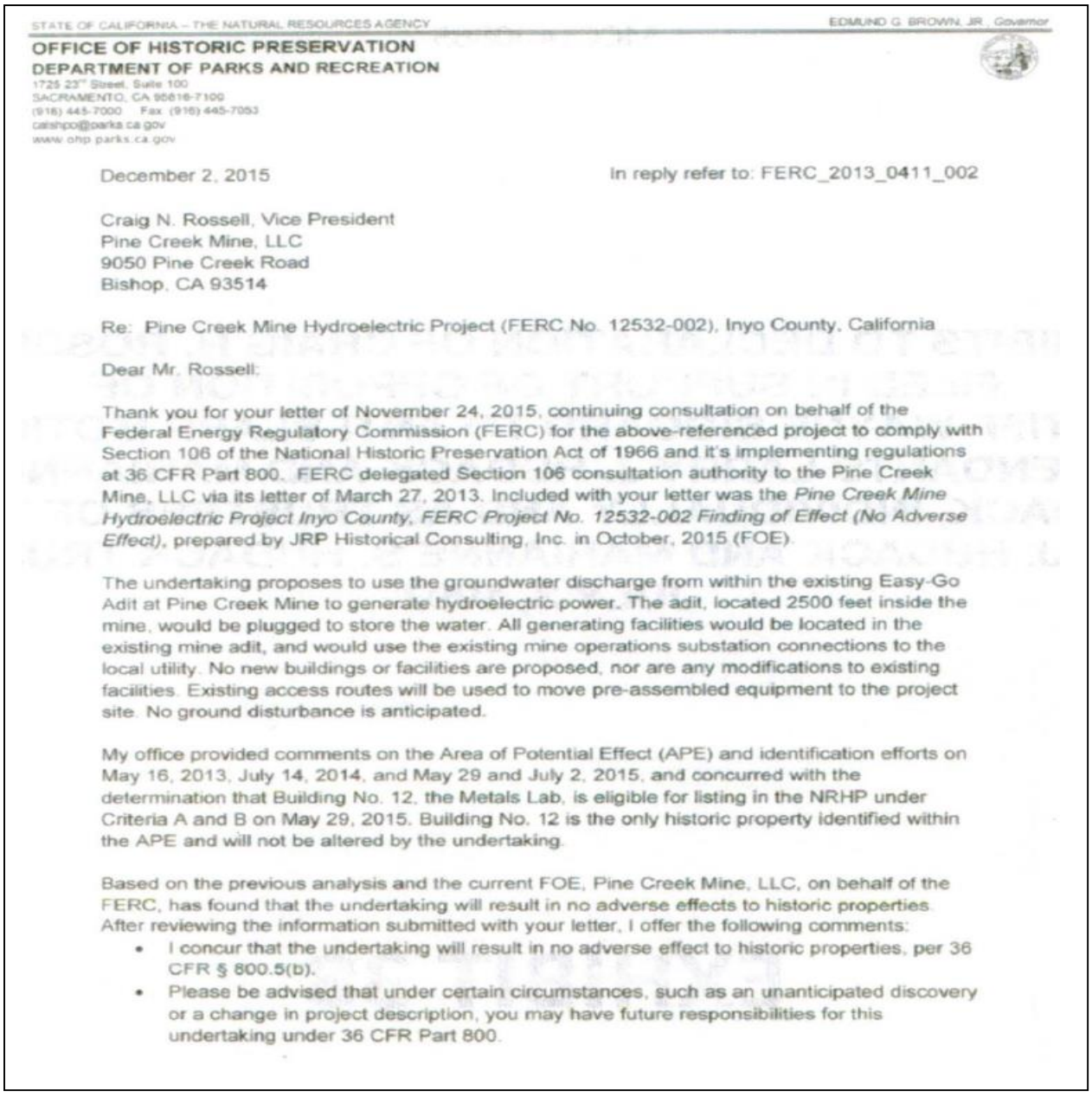
Attachment A



STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
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December 2, 2015 In reply refer to: FERC_2013_0411_002

Craig N. Rossell, Vice President
Pine Creek Mine, LLC
9050 Pine Creek Road
Bishop, CA 93514

Re: Pine Creek Mine Hydroelectric Project (FERC No. 12532-002), Inyo County, California

Dear Mr. Rossell:

Thank you for your letter of November 24, 2015, continuing consultation on behalf of the Federal Energy Regulatory Commission (FERC) for the above-referenced project to comply with Section 106 of the National Historic Preservation Act of 1966 and it's implementing regulations at 36 CFR Part 800. FERC delegated Section 106 consultation authority to the Pine Creek Mine, LLC via its letter of March 27, 2013. Included with your letter was the *Pine Creek Mine Hydroelectric Project Inyo County, FERC Project No. 12532-002 Finding of Effect (No Adverse Effect)*, prepared by JRP Historical Consulting, Inc. in October, 2015 (FOE).

The undertaking proposes to use the groundwater discharge from within the existing Easy-Go Adit at Pine Creek Mine to generate hydroelectric power. The adit, located 2500 feet inside the mine, would be plugged to store the water. All generating facilities would be located in the existing mine adit, and would use the existing mine operations substation connections to the local utility. No new buildings or facilities are proposed, nor are any modifications to existing facilities. Existing access routes will be used to move pre-assembled equipment to the project site. No ground disturbance is anticipated.

My office provided comments on the Area of Potential Effect (APE) and identification efforts on May 16, 2013, July 14, 2014, and May 29 and July 2, 2015, and concurred with the determination that Building No. 12, the Metals Lab, is eligible for listing in the NRHP under Criteria A and B on May 29, 2015. Building No. 12 is the only historic property identified within the APE and will not be altered by the undertaking.

Based on the previous analysis and the current FOE, Pine Creek Mine, LLC, on behalf of the FERC, has found that the undertaking will result in no adverse effects to historic properties. After reviewing the information submitted with your letter, I offer the following comments:

- I concur that the undertaking will result in no adverse effect to historic properties, per 36 CFR § 800.5(b).
- Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have future responsibilities for this undertaking under 36 CFR Part 800.

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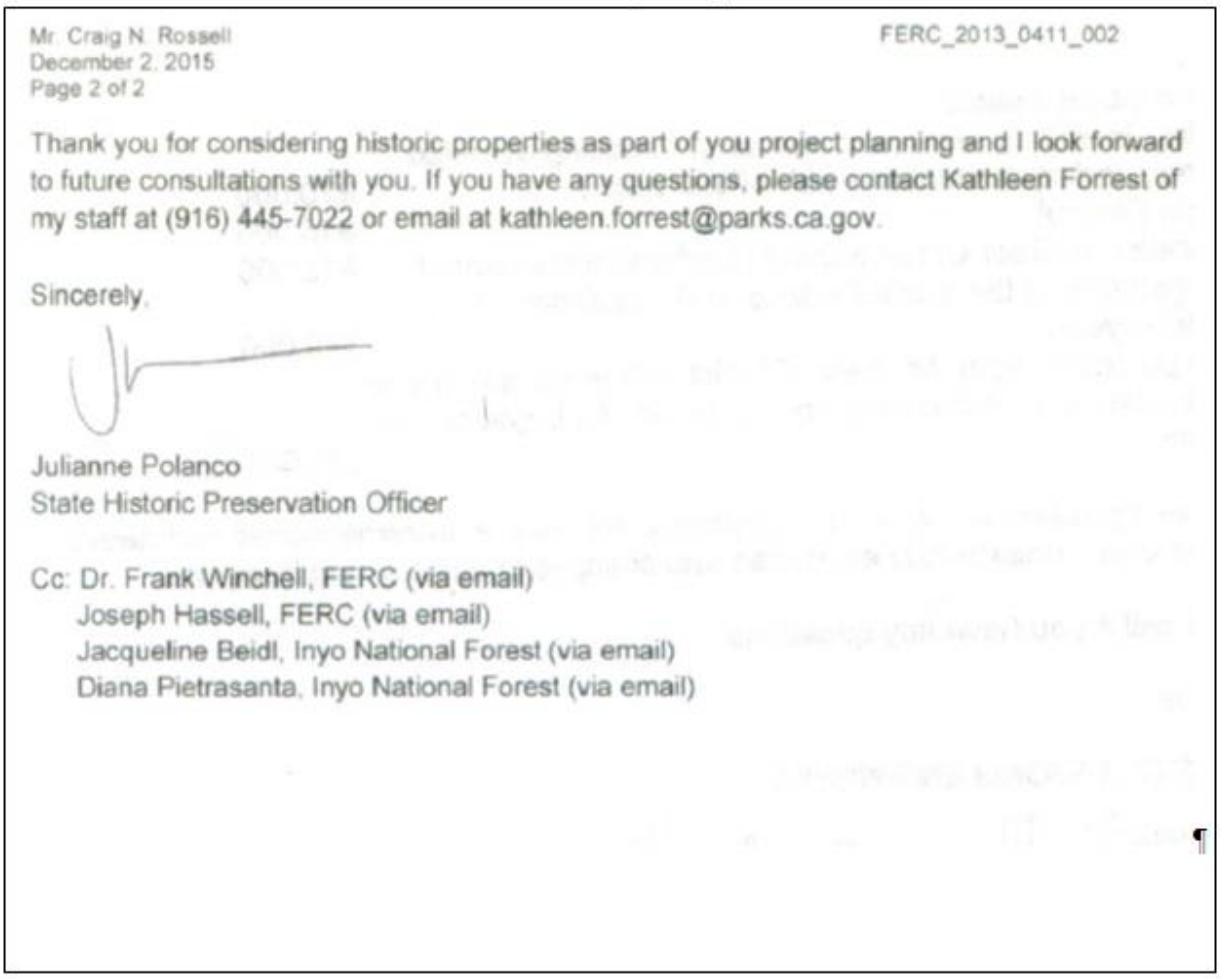

Mr. Craig N. Rossell FERC_2013_0411_002
December 2, 2015
Page 2 of 2

Thank you for considering historic properties as part of you project planning and I look forward to future consultations with you. If you have any questions, please contact Kathleen Forrest of my staff at (916) 445-7022 or email at kathleen.forrest@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Cc: Dr. Frank Winchell, FERC (via email)
Joseph Hassell, FERC (via email)
Jacqueline Beidl, Inyo National Forest (via email)
Diana Pietrasanta, Inyo National Forest (via email)

Letter of Concurrence from the State Historic Preservation Officer December 2, 2015.

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12.0 ECONOMIC ANALYSIS

For an original license, Applicant must estimate the cost of constructing, operating, and maintaining the proposed Project. Applicant should estimate the cost of each proposed resource protection, mitigation, or enhancement measure and any specific measure filed with the Commission by agencies, Indian tribes, or members of the public when the application is filed.

All new Project generating facilities will be located entirely underground in the existing mine tunnel connected to the existing tunnel plug by a penstock approximately 30 feet long. The proposed site will have a total installed capacity of 1,500 kW with a design maximum head of 1,320 feet and an average discharge of 10 cubic feet per second (cfs).

No new buildings or other facilities are proposed. No modifications to existing buildings are proposed. No ground disturbance of any kind is proposed. Manufacturing of all new generating facilities and substantial pre-assembly will occur off site and be trucked to the location. A portable crane will lift and position the wheeled generating equipment onto the existing railroad track for delivery to the plug location by a locomotive and for final assembly.

Table E-1. Summary of estimated costs associated with construction of major Project works. (All costs in 2015 dollars)

Project Component	Total Capital Cost
Final Engineering & Surveying	$40,000
Construction	
Intake Structure — Manifold & Steel Penstock	$140,000
Powerhouse Carriage Pre-Assembly	$280,000
Substation Upgrades — Electrical	$620,000
Turbine/Generator Equipment	$1,775,000
Construction Supervision and Administration	$35,000
Subtotal Construction Costs	$2,885,000
Anticipated Total Project Cost	$2,925,000

The estimated average annual cost of operation and maintenance expenses, including insurance, administrative and general expenses, and contingencies are $30,600 as described below.

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Table E-2. Annual costs of operation and maintenance.

Maintenance Activity	Est. Annual Cost ($2015)
Turbine and Generator Inspections (Compliance)	$1,000
Plug Leaching Tests and Treatment (Compliance)	$1,000
Periodic Water Testing Compliance)	$3,000
Powerhouse/Carriage Hardware Maintenance	$500
Insurance and General Expenses	$25,000
Total Annual Cost	$30,500

The Pine Creek Mine began operations in 1916. From 1937 until 1990, it was in nearly continuous production. The underground portion of the Pine Creek Mine comprises over 100 miles of underground workings that are used for tungsten mining. This Project will use approximately one-third of the ore-body workings (by volume) for water storage and create hydroelectricity. The table below provides a summary of estimated original costs, using 1970's dollars for original the construction, associated with construction of major Project works for the Pine Creek Mine Hydroelectric Project.

See Table E-3 On Next Page

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Table E-3. Summary of estimated original costs associated with construction of major Project works.

A table is not provided.

Decades ago prior mine owners developed many of the improvements that will be used in the Project: the Easy-Go access road, the Easy-Go portal and adit, the mine water discharge ditch and conduit, the electric substation, and the excavation of the lower orebody itself. The cost to construct these various improvements is presently unknown. However, the reinforced concrete plug was constructed in 2002 at a cost of roughly $1,350,000.

No material alterations or modifications have been made to the structures and improvements listed above.

The estimated average annual value of the Project power is $1.425 million over the proposed 20-year analysis period (1500kW/h x 24hr/day x 360 x $.11/kW). The revenue estimate used in this analysis is based on current and recent electric generation rates established by Southern California Edison for FERC No. P-13163 the Pine Creek Mine Water Discharge System Sites 1 and 2, an exempted conduit project currently operating at the Pine Creek Mine.

13.0 CONSISTENCY WITH COMPREHENSIVE PLANS

The Federal Power Act requires FERC to review applicable federal and state comprehensive plans and consider consistency with such plans during licensing efforts. FERC's SD identified plans applicable to the Project: these are described below. Pine Creek's review of these plans finds the current and proposed Project operations are consistent with each.

13.1 California Outdoor Recreation Plan (CDPR 1994)

California Department of Fish and Game (CDFG). 1993. Restoring Central Valley streams: A plan for action. Sacramento, California. November 1993. 129 pp.

13.2 Public Opinions and Attitudes in Outdoor Recreation (CDPR 1998)

California Department of Parks and Recreation (CDPR). 1998. Public Opinions and Attitudes on Outdoor Recreation in California. California State Parks. March 1998.

1994. California outdoor recreation plan, 1994. Sacramento, California. April 1994. 154 pp. and appendices.

13.3 Recreation Needs in California (CDPR 1983)

1983. Recreation needs in California. Sacramento, California. March 1983. 39 pp. and appendices.

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13.4 Recreation Outlook in Inyo County

1980. Recreation Outlook in Planning District 3. An Element of the California Outdoor Recreation Resources Plan.

13.5 The Nationwide Rivers Inventory (NPS 2008)

United States Department of the Interior, National Park Service (NPS). 2008. Rivers: Nationwide Rivers Inventory. National Center for Recreation and Conservation. Available online at: http://www.nps.govincrc/programs/rtca/nri

13.6 United States Fish and Wildlife Service (USFWS 2006)

Central Valley Joint Venture Implementation Plan — Conserving Bird Habitat. Available online: http://www.centralvalleyjointventure.org/assets/pdf/CVJV fnl.pdf

13.7 Department of the Interior

Bishop Resource Management Plan, Bishop, California. April 1993. Bureau of Land Management.

13.8 California Department of Fish and Game (2007)

California wildlife: Conservation challenges, California's wildlife action plan. Sacramento, California.

13.9 U.S. Forest Service (1988)

Inyo National Forest Land and Resource Management Plan. Department of Agriculture, Bishop, California.

13.10 State Water Resources Control Board (1999)

Water quality control plans and policies adopted as part of the State comprehensive plan.

14.0 CONCLUSIONS AND RECOMMENDATIONS

14.1 Comparison of Alternatives

There are no meaningful comparative alternatives. The so-called No Action Alternative would deprive Applicant of the right to put the mine to its best and highest use while reducing the amount of renewable energy available to the public.

14.2 Unavoidable Adverse Impacts

There are no known, let alone unavoidable, adverse effects associated with the Project.

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14.3 Finding of No Significant Impacts

Since the license process started, there have been no known changes in environmental conditions or human activity in the Project area. On the basis of the environmental analyses performed for the Project, there are no known negative impacts associated with the Project so that to license the Project would not constitute a major federal action significantly affecting the quality of the human environment. The Project is expected to create no material change in how the mine property is utilized from an environmental standpoint.

15.0 CONSULTATION DOCUMENTATION

15.1 Response to FERC Staff Comments on the Preliminary License Proposal

On August 26, 2015 FERC Staff provided Comments on Pine Creek's PLP filed June 1, 2015 pursuant to 18 C.F.R. section 5.16(e). Listed below are the Staff Comments and Pine Creek's responses to them:

Project Operations

1. The Preliminary License Proposal (PLP) states that Pine Creek… will operate the project with a run of the mine release. Please provide additional information on how the discharge would be regulated to ensure a run of the mine release. Because of the nature of your project, inflow cannot be measured accurately, and therefore insuring that releases equal inflow requires that storage not fluctuate. Please describe the measures, equipment and monitoring procedures that you will employ to ensure a run of the mine release.

Response to FERC Comment 1:

The discharge of water would be regulated to ensure a run-of-the-mine release once a water storage base is gradually established in the mine. The powerdraft of the unit would be set to maintain the pressure to balance the inflow and outflow of waters to and from the mine, insuring a run of the mine release. Once the reservoir is full, it will be maintained at that general height so that fluctuations in inflow are reflected in outflows for hydroelectric generation.

Specifically, it is contemplated that a pressure transducer will be installed on the supply line to the turbine or static bypass line and connected to the pressurized section of the tunnel to provide continuous water weight and therefore water height measurements. The pressure transducer will have a direct readout and also send continuous data to the logger/controller for the unit.

It is contemplated that the generating unit will be Pelton-type impulse turbine with jet deflectors that will intercept the flow of water in the event of a generator trip. It is also contemplated that the position of the turbine nozzle(s) will be set manually. With the

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use of deflectors, in the event of a unit trip the amount of water would continue to flow as previously set.

The engineer contracted to specify the turbine generator is Matthew Gass, P.E. (www.hydromg.com), an expert in impulse turbine design and operation with over 30 years of experience in this area.

2. On page 53, you indicate that a turbine shutdown could result in the reduction of flow in Morgan and Pine Creeks. However, you do not specify the reduction in flow that could be expected in the event of such a shutdown, nor do you include an analysis of the potential effect of that reduction of flow on physical habitat in Morgan and Pine Creeks. Please provide this information.

Response to FERC Comment 2:

As indicated above, the generating unit will be Pelton-type impulse turbine with jet deflectors that will intercept the flow of water in the event of a generator trip. With the use of deflectors, in the event of a unit trip the amount of water would continue to flow as previously set by bypassing the hydro generator. Current design of hydro facilities eliminates the potential effect of the reduction of flow of water on physical habitat in Morgan and Pine Creeks when properly engineered.

3. On page 53, you also indicate that a turbine shutdown could impact fish species. However, in the PLP you do not specify which fish species are known to occupy Morgan and Pine Creeks. In your description of the existing environment, please note which fish species are known to occupy the project.

Response FERC to Comment 3:

Per a database search performed in 2008 by Troutman Sanders LLP, Brook, Golden, Brown and Rainbow Trout inhabit Pine Creek downstream from the Project.

No adverse impact on fish from the Project is anticipated because regardless of turbine operation or non-operation the amount of mine water discharged through the Pelton turbine will continue at run of the mine levels, as has historically been the case, because the turbine will discharge water to atmospheric pressure. Run of the mine releases will reflect fluctuations in seasonal weather patterns.

4. On page 55, you utilize the acronym "RBP," but do not provide a definition of that acronym. Please define the acronym "RBP."

Response to FERC Comment 4:

"RBP" is an abbreviation for Rapid Bioassessment Protocol. RBP has been added to List of Acronyms and Definitions in the FLA.

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Cultural Resources

5. The California State Historic Preservation Office (SHPO) filed two letters (filed on 6/1/2015, and 7/6/2015, respectively) with us on their review and consultation with you involving historic properties which may be potentially affected by the proposed project, pursuant to section 106 of the National Historic Preservation Act. Specifically, in their letters the SHPO cites a letter you sent them, dated April 27, 2015. Please provide this letter, along with the referenced cultural resources report, dated March 2015, and any other associated attachments you provided to them.

Response to FERC Comment 5:

On August 28, 2015, Pine Creek Mine e-filed the information requested in Comment 5 directly with FERC: "Supplemental Information / Request of Pine Creek Mine LLC under P-12532-004. Final CRIER Pine Creek Mine dated July 2015 and letter to SHPO" dated April 27, 2015. Accession No. 201508285225. Due to the large file size and printed document, no copy is provided here.

6. At this time, we would also like for you to send another letter to the SHPO, on our behalf, requesting that they concur with a finding of no historic properties affected by the proposed Pine Creek Mine Hydroelectric Project. Along with the letter, please provide the SHPO any supporting information on the finding of no historic properties affected, including the March 2015 cultural resources report.

Response to FERC Comment 6:

As requested, on August 27, 2015 Pine Creek Mine sent a letter requesting that the State Historic Preservation Officer concur with a finding of no historic properties affected by the proposed Pine Creek Mine Hydroelectric Project. A copy of that letter was e-filed with FERC on August 28, 2015.

In a letter dated December 2, 2015, the State Historic Preservation Officer concurred with a finding that the undertaking will result in no adverse effect to historical properties, per 36 CFR 800.5(b), as a result of the proposed Pine Creek Mine Hydroelectric

Project. A copy of that letter was e-filed with FERC on December 2, 2015. A copy of the letter is located on page 109 of the FLA.

Terrestrial Resources

7. The discussion of the Yosemite toad and Sierra Nevada yellow-legged frog (pages 70-71) should be revised to reflect the fact that these species are now federally listed as threatened and endangered, respectively (Federal Register: 24,256- 24,310, April 27, 2014). Also, critical habitat has been proposed for these species (Federal Register 78: 24,515-24,574, April 25, 2013). The final license application should describe the locations of critical habitat for these

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species in relation to the proposed project and discuss any potential effects on primary constituent elements, as outlined in the proposed listing.

Response to FERC Comment 7:

The FLA has been revised to read, "The Yosemite Toad was designated as a Federally Threatened Species on April 27, 2014 (Federal Register: 24,256- 24,310, April 27, 2014)." and "The Sierra Nevada Yellow-legged Frog was designated as a Federally Endangered Species on April 27, 2014 (Federal Register: 24,256- 24,310, April 27, 2014).

The map on page E-70 of the FLA shows the approximate location of critical habitat for the Yosemite Toad in relation to the proposed Project. The Project Boundary is considered within the critical habitat area but since the project is exclusively underground, no impact on the toad habitat is anticipated.

The map on page E-71 of the FLA shows the location of critical habitat for the Sierra Nevada Yellow-Legged Frog in relation to the proposed Project but, again, since the project is exclusively underground, no impact on the frog habitat is anticipated.

8. The PLP notes (page 76) that "A temporary increase in vehicle trips may occur to transport materials to the site; however, this increase would be minimal and is not expected to adversely affect SNBS [Sierra Nevada bighorn sheep]." The final application should provide more specific information on the approximate number of vehicle trips, types of vehicles, routing, etc.

Response to FERC Comment 8:

A substantial portion of the work will entail pre-assembly of the turbine/generator carriage and penstock infrastructure offsite. Construction at the site will occur over a four-week period with two phases of construction: (1) Electrical substation upgrades and (2) staging for arrival of the carriage and assembly at the Plug.

Construction-related trips to the mine property will consist of one commercial semi-truck for delivery of all pre-assembled equipment. An onsite crane will remove the equipment at the staging area outside the Easy-Go Portal. The pre-assembled turbine and penstock will be loaded onto a locative and transported via existing tracks to the plug. Laborers will reside at the mine during installation of the turbine and penstock so few extra trips to the mine are anticipated. Support vehicles and personnel are estimated at 5-10 round trips to and from the mine over the course of a maximum four-week installation period. There is only one access to the Project, Pine Creek Road, a county maintained road. The Easy-Go Access Road over the former mill site and the staging area at the Easy-Go Portal are on private land.

9. The PLP notes (page 77) that "A temporary increase in noise levels may occur during the installation of new facilities; however, this is not expected to significantly raise noise levels that would adversely affect SNBS." The final

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application should provide more specific information on the approximate increases in noise levels during construction, sources, timing, and duration.

Response to FERC Comment 9:

Potential sources of noise during construction consists primarily of increased commercial and support vehicle trips using Pine Creek Canyon Road to deliver and then assemble the hydroelectric generation and substation equipment. Placement of the hydroelectric equipment will occur with existing locomotive transport. Plumbing and electrical tradesmen will be transported to the job site in the same manner, entirely within the mine. The electrical substation is adjacent to the outside staging area next to the Transportation Building and will require no special access needs, but construction will likely generate temporary increased noise levels while installing and securing the upgraded electrical equipment.

Exhibit G and Project Facilities

10. The Exhibit G Project Boundary shows only the mill site and none of the property over the Easy Go Adit, the turbine or the flooded mine. Detail A of Exhibit G shows a project boundary that only encloses the area outside the mine that connects the project's transmission cable to the SCE substation. None of the subterranean features of the project are included in the Project G Boundary map. The footprint of the subterranean features should be projected to a surface map to indicate the project boundary's total footprint. A project boundary map should enclose all the project works necessary for the project. Your project boundary should show in addition to what you have presented as Detail A, a projection of the project's boundary over the turbine and plug, and over any portion of Easy Go adit or any other adit in which a primary transmission cable is located. Please incorporate this information into the appropriate figures (i.e., maps) to be provided as part of the license application.

Response to FERC Comment 10:

A new Exhibit G-1, Project Boundary Map, shows the mill site and the property over the Easy Go Adit, the turbine and the flooded mine included within the boundary. Detail A of Exhibit G-1 now shows a complete Project boundary that encloses the subterranean area within the mine, the staging area outside the mine portal, the cable to the private substation, the private 620 foot long transmission line to the SCE substation and the SCE owned substation. All of the subterranean features of the Project are now included in the Project G-1 Boundary Map as well as the patented and unpatented mining claims.

A new Exhibit G-2 shows the footprint of the subterranean features projected to a surface map to indicate the Project Boundary's total footprint.

Full scale copies of Exhibit G-1 and G-2 (.pdf files) are attached for Staff review and formal submission to FERC. However, due to the substantial amount of information provided in each exhibit, encompassing a large geographic area, the exhibits are

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difficult to read in a small print report format. We have copied relevant portions of the exhibits and scaled it to fit in a report format.

15.2 Response to FERC Deficiencies and Additional Information Request on the Final License Application

Pursuant to 18 CFR 5.20(2)(a), on April 8, 2016 FERC Staff provided Comments on Pine Creek's FLA filed on February 12, 2016. In that document a list of deficiencies in the originally filed FLA were noted. Additional information was also sought. The April 8 letter is set forth below. After each item Pine Creek responds.

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
April 8, 2016

OFFICE OF ENERGY PROJECTS

Project No. 12532-006-California
Pine Creek Tunnel Hydroelectric Project
Pine Creek Mine, LLC

Mr. Craig N. Rossell
Pine Creek Mine, LLC
228 West Bonita Avenue
Claremont, California 91711

RE: Deficiencies and Additional Information Request for Pine Creek Tunnel Hydroelectric Project

Dear Mr. Rossell:

Your license application for the Pine Creek Tunnel Hydroelectric Project P-12532-006 filed on February 12, 2016, fails to conform to the requirements of the Commission's regulations.

A list of deficiencies is attached in Schedule A. Under section 5.20(a)(2) of the Commission's regulations, you have 90 days from the date of this letter to correct the deficiencies in your application.

Requests for additional information made pursuant to section 5.21 of the Commission's regulations are attached in Schedule B. Please provide this information within 90 days from the date of this letter.

If the correction of any deficiency causes other parts of the application to be inaccurate, that part must also be revised and refiled by the due date. Also, please be aware that further requests for additional information may be sent to you at any time before final action on your application.

The Commission strongly encourages electronic filing. Please file the requested information using the Commission's eFiling system at http://www.ferc.gov/docs-filing/efiling.asp. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov, (866) 208-3676 (toll free), or (202) 502-8659 (TTY). In lieu of electronic filing, please send a paper copy to: Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Washington, D.C. 20426. The first page of any filing should include docket number P-12532-006.

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If you have any questions regarding this letter, please contact Joseph Hassell at (202) 502-8079, or via email at joseph.hassell@ferc.gov.

Sincerely,

Timothy Konnert, Chief
West Branch
Division of Hydropower Licensing

Attachments: Schedule A – Deficiencies
Schedule B – Requests for Additional Information

cc: Mailing List, Public Files

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Schedule A
Project No. 12532-006

DEFICIENCIES

The following is a list of deficiencies that have been identified after review of the final license application (FLA) for the Pine Creek Tunnel Hydroelectric Project. These deficiencies must be corrected within 90 days of the date of this letter.

Initial Statement

1. Your Initial Statement does not provide all of the information required by section 4.61(b) of the Commission's regulations. To address this deficiency, please provide: (a) the exact name, address, and telephone number of each person authorized to act as agent for the applicant in this application; (b) the lands of the United States affected in acres according to Exhibit G and the agency or Department responsible for management of those lands; and (c) a statement on how many months after a license issuance that project construction would commence and how long after license issuance that the project would be completed.

   Response: for sub (a), please see IS-2.1 at p. IS-1; for sub (b), see IS-13.0 at p. IS-6, and Exhibit G-1&2; for sub (c), see IS-1.0 at p. IS-1.

   In responds to Item (b), above, Exhibit G-1 identifies all lands lying within the Project Boundary. Within that area, some five acres of subsurface land, between the edge of the mine's private property (at the Easy-Go Portal) and the plug, lie below Forest Service surface lands. Another estimated 55 acres of subsurface land to be used for water impoundment also lie below Forest Service surface lands. This estimated 60 acres are entirely covered by mining claims to which Pine Creek Mine, as assignee, has control pursuant to an assignment from sister company Bishop Tungsten Development, LLC, which owns the claims. A deed also covers 39.5 acres that constitute the substation, former millsite, offices, shops and related buildings. (See Appendix 1 to this Exhibit E.) Thus, Applicant has the sole right to construct, operate and maintain the Project, which lies entirely underground unless on private property.

Exhibit A

2. You are required by section 5.18(a) to provide an Exhibit A with your application. Exhibit A is a description of the project and its mode of operation. You must provide an Exhibit A in the form described under section 4.61 of the Commission's regulations.

   Response: Exhibit A has been added. .

Exhibit G

3. Section 4.41(h) of the Commission's regulations requires that the Exhibit G map show the location of the project and it principal features. Sheet 1 of the Exhibit G

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PDF maps shows what appears to be the regional distribution line and includes a note stating that the feature is not a project facility. In addition, sheet 1 does not show the 320-foot-long project transmission line. Therefore, you must file a revised sheet 1 of Exhibit G that shows and labels the 320-foot-long project transmission line including its interconnection with the regional distribution line.

Response: revised Exhibit G-1 now includes the private substation, transmission line, SCE substation and regional distribution line.

4. The B-2 inset on the Exhibit G map shows that the project boundary encloses the privately owned SCE substation. The project boundary must enclose all project works and other features that are to be licensed. In the FLA, you did not identify the SCE as a project facility. If the SCE substation is not a project facility then it should not be included within the project boundary and the Exhibit G map should be revised accordingly and filed with the Commission. If the SCE substation is a project facility then it should be specified as such in the appropriate section of the FLA.

   Response: please see ES-3.8 at p. ES-8; E-2.1.1 at p. E-7; and revised Exhibit G-1 at p. G-I to G-4.

   The Project Boundary has been expanded to include the private transmission line and the SCE substation. Exhibit G-1 also now also now includes the regional transmission line which is not included in the Project boundary. All

Project Lands

5. Section 4.61(b) of the Commission's regulations require an accounting in acres of lands of the United States affected by the project. Your application states that those underground portions of the project are situated on privately-owned land. However, because the project features would be located under Forest Service land, we consider the Forest Service land above the project features to be affected by the project for purposes of section 4.61(b). Please provide the area of the project to be located under National Forest lands as indicated in Exhibit G and extrapolated to the land surface directly above the project boundary. Also, please provide the acres within the project boundary that are on private property.

   Response: please see response to Item 1, above, for a discussion of acreage. See, also, IS-12.0 at p. IS-5; IS-13.0 at p. IS-6; Appendix 4 to Exhibit E; and revised Exhibit G-1.

   A licensed California land surveyor, John Williams, has conducted a field survey of the plug and determined that it lies within the Project Boundary, specifically, at the border of two mining claims known as EASYGOING NO. 1 AND EASYGOING NO. 3. (See Appendix 4 to this Exhibit E.) Based upon markers and coordinates, and extrapolated to the land surface, the plug clearly lies below valid mining claims.

   That portion of the Project that daylights at the Easy-Go Portal and that includes the power lines and substation encompass approximately three acres.

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The estimated 60 acres of the Project that lie below Forest Service lands are entirely covered by mining claims to which Pine Creek Mine, as assignee, has control pursuant to an assignment from sister company Bishop Tungsten Development, LLC, which owns the claims. (See Non-exclusive Assignment Agreement in Appendix 1 to this Exhibit E.)

The statement that "Forest Service land above the project features [are] affected by the project" appears to have no basis in law. Where the Project Boundary lies below federal lands, valid mining claims exist. Since Forest Service jurisdiction over such land is limited to land surfaces, and because the Project will not disturb land surfaces, lying deep within the mountain, Forest Service land will not be affected by the Project. The Project is mining-related because it will supply power to mine and process commercial tungsten.

Information requested by this Deficiency is similar to that information sought under Request for Additional Information – Item I. Please see Applicant's response to that item for additional information responsive to this Deficiency.

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REQUESTS FOR ADDITIONAL INFORMATION

The following is a list of additional information needs that have been identified after review of the final license application for the Pine Creek Tunnel Hydroelectric Project. Please file the requested information within 90 days of the date of this letter.

Proprietary Rights

1. Section 5.18(a)(1) requires applicants to identify entities with relevant proprietary rights. Under Section 7.0 of your application, you state that the project will be located under federal lands, the surface of which are managed by the U.S. Forest Service and that you have the sole proprietary right to construct, operate and maintain the project. The Forest Service has previously stated that the plug was constructed under trespass and without its permission. [Footnote omitted.]

   Please provide copies of the documents, patents and deeds that support the claim that you have the sole right to construct, operate and maintain the project. Because the Forest Service claims that the reinforced concrete plug was constructed without their permission and in trespass upon their lands, please provide a legal explanation of why your patents and deeds allowed the construction of the concrete plug, which has no mining related purpose, without the Forest Service's permission.

   Response: please see IS sections 12.0 and 13.0; Exhibit E - Appendices 1 and 2 ; and Exhibit G-1.

   Parenthetically, this request for additional information is related to Deficiency Item 5. Please see Pine Creek's response to that item.

   Here FERC, representing the Forest Service, states that "the Forest Service claims that the reinforced plug was constructed… in trespass upon their lands." Pine Creek is therefore requested to "provide a legal explanation of why [its] patents and deeds allowed the construction of the concrete plug, which has no mining related purpose, without the Forest Service's permission." From the foregoing it necessarily follows that if Pine Creek can show that (1) the Project, including the plug, is located within one or more valid mining claims or on private land, (2) Pine Creek's patents and deeds legally permit construction of the Project, and (3) the Project furthers some actual mining-related purpose, the Forest Service's repeatedly asserted claim of trespass (and the Forest Service's purported jurisdiction over the project) may be disposed of.

   The first two issues may be resolved by the same evidence. Attached as Appendix 4 to this Exhibit, please find a June 24, 2016 letter from John R. Williams of triad/holmes associates. Williams is a licensed California land surveyor. Over June 22-23, 2016 triad performed a land survey to determine the

exact location of the plug. With that information in hand, triad then "extrapolate[d] to the land surface directly above the project boundary" and determined that the plug lies directly beneath the "an overlapping portion of EASYGOING NO. 1 and EASYGOING NO. 3." Williams concludes that "[t]he surveyed location of the concrete plug is in general agreement with the location as shown on Exhibit G-1 [of Pine Creek's Final License Application]… prepared by Andrew K. Holmes dated 6/9/2016." A survey map accompanies Williams' letter. Holmes' work is also made part of Appendix 4.

Attached as Appendix 1 to this Exhibit E please find the deed to that land within the Project Boundary that lies on private land. In addition, "Lode Mining Claim Location Notice (California)" certificates for both the Easygoing No. 1 and Easygoing No. 3 unpatented mining claims, as well as other mining claims that relate to the Project, are part of Appendix 1. In addition, Appendix 2 shows the claims in question are current with the BLM. While these claims are owned by Bishop Tungsten LLC, Bishop Tungsten has assigned them to Pine Creek Mine, LLC. (See Appendix 1.)

Accordingly, while certain "project features" are located under Forest Service land, they are mining-related features that lie within valid unpatented mining claims held by assignment by Pine Creek Mine, LLC.

The Project began years ago with construction of the concrete plug for the primarily purpose of creating a stand-alone mining operation. More than $1 billion in proven reserves lie within the mine. It was always just a matter of time. These sizable reserves are of historic strategic importance to the United States. The Department of Defense is aware of them. As the market for tungsten continues to strengthen, and as other tungsten mines, especially those in China, become exhausted, Pine Creek Mine is viable once again. Applicant, as principal, and Gold Rush Mining, LLC, as agent, have an agreement for the immediate resumption of mining operations.

Mining operations will have substantial power requirements that are to be met entirely by the Project. The installation and operation of the concrete plug constitutes a key first phase development step for the reopening of the mine. The range of needed power anticipated for the initial resumption of mining operations is 350-850 kW. Actual power output from the Project will of course vary with the amount of water held in reserve. Power generated from the Project will be directed first to the then-current demand at the mine. Excess capacity will be made available for public consumption. That capacity will fluctuate depending on mining demand as well as water levels inside the mine and the amount of power available.

The energy generated from the tunnel plug project is thus key to the future operation of the mine. As electricity demand for mining increases, more energy

will be pulled from the Project. In the interim, Pine Creek Mine intends to sell temporary excess capacity pursuant to an offtake agreement.

The existing 250 kW hydroelectric facility at the mine is subject to a 20-year CREST agreement with Southern California Edison and is unavailable to support mining operations.

Pine Creek expects that once the mine is fully operational, the entire electrical generation from the concrete plug Project will be used for mining operations. While there will exist times, particularly at the outset, when significant excess capacity is generated, the mining law does not require that the plug, and by extension the Project, have an exclusive mining purpose for Pine Creek to develop the Project.

Pursuant to 30 USC § 256, the Federal Mining Law grants the locator of a mining claim broad possessory rights, including the right to such ancillary uses that are incident to prospecting and mining. Under the provisions of the 1955 Multiple-Use Mining Act, a mining claimant is permitted to use his or her claim for purposes of "prospecting, mining, or processing and uses reasonably incident thereto." 30 USC § 612. As a use "reasonably incident" to the operation of the Pine Creek Mine and the development of the minerals within the mining claims assigned to it, the concrete plug is an authorized use under the Federal Mining Law.

For further legal support concerning why Applicant's patents and deeds allowed the construction of the concrete plug without the Forest Service's permission, please see that letter from Richard R. Hall of Stoel Rives LLP to Edward Armenta of the Forest Service dated January 6, 2015. That letter is reproduced at the end of this section.

Aquatic Resources

2. In section 8.1 you indicate that Brook, Golden, Brown, and Rainbow Trout are "known to inhabit Pine Creek downstream from the project." However, you provide no contextual information concerning the distribution, relative abundance, or life histories of those species in Pine Creek. To the extent it is available, please provide this information to more adequately describe the affected environment pursuant to section 5.18(b)(ii)(A).

   Response: please see E-8 at p. E-43.

   Information concerning the distribution, relative abundance, or life histories species in question is not available except based upon the personal experience of those who live at or near the mine.

3. In section 8.1.1 *Macroinvertebrates*, you describe, in detail, methods that were used to collect data on physical habitat and the benthic macroinvertebrate assemblage in Pine Creek. However, you do not present the results of those studies – specifically, you provide no description of the macroinvertebrate assemblage or physical habitat characteristics of Pine Creek. Please provide this information to more adequately describe the affected environment pursuant to section 5.18(b)(ii)(A).

   Response: see E-8.1.1 at pp. E-46-58.

   The results of the studies performed previously are now included in detail.

4. In section 8.1.1 *Macroinvertebrates,* you provide results of a Rapid Bioassessment Protocol (RBP) and an Index of Biotic Integrity (IBI), but you provide no context for those results and provide no explanation of the biological or site-specific relevance different scoring metrics listed (i.e. channel alteration parameter, sediment deposition, epifaunal substrate cover, SoCal B-IBI). Please provide this additional information to more adequately describe the affected environment pursuant to section 5.18(b)(ii)(A).

   Response: please see E-8.1.1 at p. E-46-58, Figure 3, E-46.

   The results of the studies performed previously are now included in detail.

5. Section 8.0 of your application provides analysis of potential project-related impacts due to operation of the proposed project, but provides no mention of or analysis relating to potential impacts of project construction, which was identified in the scoping documents. Please provide this analysis.

   Response: please see E-4.1 at p. E-27; E-8.2 at p. E-59; E-11.3.1 at p. E-103; E-11.3.2 at p. E-106.

Wildlife Resources

6. As noted by California Department of Fish and Wildlife (California DFW) in their comments on the PLP (filed August 28, 2015) several protected bird species have the potential to occur within the vicinity of the project area including, but not limited to: bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). In consultation with California DFW please determine if any known nest sites occur in the project area that could be potentially disturbed by project-related activities.

   Response: please see E-3.3.1 at p. E-25; E-9.1.1 at p. E-59; E-9.1.4 at p. E-62.

   No special status species of birds are known to be nesting in or near the Project Boundary.

7. Please clarify what Figure 9.1.2 titled: “SNBS Detections within vicinity of study area – bats” is displaying. It appears that it may be Sierra Nevada bighorn sheep locations, but the title includes the word bats.

   Response: : please see E-9.1.4 at p. E-67.

   This mistake is been corrected.

The Concrete Plug and Project Discharges

8. Your application states that that your project would use the same water as an exempt project located downstream. However, there are no drawings or figures in the application that show the pathway of the water from your project to this existing downstream hydroelectric facility. Please provide a description of how the discharge from your proposed project would be conveyed to the downstream hydroelectric project, including drawings and/or photographs, as appropriate. Please also describe if/how this discharge would be different than current “no project” conditions.

   Response: please see Exhibit A - (viii) at p. A-11; Figure A.4 at p. A-9; Figure A.5 at p. A-10; and a new Exhibit G-3.

   This revised FLA now provides information showing the pathway of the water from this Project to the existing downstream hydroelectric facility. RI number 9

9. An unexpected release of approximately 200 acre-feet of water under1,320 feet of head has the potential to cause serious damage to any structures downstream. Please specify the expected discharge from the project should the plug fail during project operation. Please also provide a description of the probable zone of inundation that would be flooded if the concrete plug failed, including any structures that would be located within the inundation zone.

   Response: please see E-6.1 at p. E-31; and Appendix 3 hereto.

   To respond to this issue, Applicant commissioned additional analysis that all but rules out the kind of cataclysmic event assumed by this hypothetical. However, the theoretical results of a catastrophic failure of the plug and its downstream effects are described.

10. Your application states that the maximum head on the project would be 1,320 feet. Please provide a description of what would happen should water levels in the mine rise above 1,320 feet, including where the water would exit the mine.

Response: please see E-6.1 at p. E-34 and Appendix 3 hereto.

Available analysis indicates that the maximum hydraulic head from water storage will never be great enough to push water above the 1,320 foot level, so that the likelihood of stored water exiting the mine in uncontrolled ways is either impossible or remote. That said, however, instrumentation to be installed as part of Project will constantly monitor water pressure (and related water levels) so that unexpected increases in stored water levels may be reduced by activating additional openings in the plug.

To provide further legal explanation for construction of the plug without Forest Service permission, please find the following letter from Richard R. Hall of Stoel Rives LLP to Edward Armenta, Inyo National Forest, dated January 6, 2015:

See Letter On Next Page

STOEL RIVES LLP
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January 6, 2015

VIA FACSIMILE (760) 873-2486
and CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Inyo National Forest
Attn: Edward Armenta
Forest Supervisor
351 Pacu Lane, Suite 200
Bishop, CA 93514

Re: Pine Creek Mine LLC - Request for Removal of Concrete Plug

Dear Mr. Armenta:

This law firm represents Pine Creek Mine, LLC and related entities (the "Company") in connection with the Company's activities at the Pine Creek Mine site near Bishop, California (the "Mine"). This letter is provided in response to past directives by Inyo National Forest ("National Forest") to remove the concrete underground tunnel plug constructed within the boundaries of the Company's federal mining claims. The intent of this letter is to clarify the Company's purposes for the plug and state the legal basis for the ongoing presence of the plug by the Company.

Consistent with the position that the plug must be removed, in your recent September 9, 2014 letter you assert that the "plug has no use in mining" and that there is therefore "no justification for the continuing presence of the plug on National Forest lands." However, these assertions have no basis in fact.

As I believe you are aware, the plug was installed in 2002 in an underground mine tunnel within the boundaries of one of the federal mining claims held by the Company, a mining claim that the Company continues to hold to this day. It was installed by the Company to provide electricity for future commercial mining operations. Once constructed, it was tested and proven safe. For over ten years, however, the valves within the plug have been in the open position as requested by the National Forest so that groundwater within the Mine has continuously flowed through the plug. To be clear, there has been no water storage behind the plug for over ten years. There is no hydrostatic pressure. The plug is located underground within the boundaries of a

valid mining claim and is for use in connection with commercial mining operations authorized by the United States mining laws (30 U.S.C. §§ 21-54). The Company thus has the legal right to have and maintain the plug as a holder of a valid mining claim under the Federal Mining Law.[1]

While depressed market prices for tungsten have continued longer than expected, market conditions have improved and the Company is actively pursuing commercial mining options. It expects to utilize the plug for private electrical generation at the Mine in the relatively near future. Surplus electricity will presumably be sold commercially.

In your September 9, 2014 letter, you further assert that the absence of active mining operations and the undertaking of reclamation activities justify the National Forests' position that the plug must be removed. While the Company acknowledges that commercial operations at the Mine have not yet begun, mining activities continue daily. Further, while the Company has undertaken reclamation activities, those activities are limited to portions of the Mine site that would not be utilized in future operations. Neither commercial inactivity nor ongoing reclamation activities in any way strip the Company of its rights as a mining claimant under the Federal Mining Law.

It appears that the National Forest has taken the position that the denial by FERC of the preliminary permit further justifies the National Forest's assertions that the plug must be removed. To clarify, the Company has sought FERC approval to allow the Company to pursue electricity sales to the grid as a source of revenue while the Mine is being developed. While the denial of the preliminary permit by FERC will prevent such sales, that denial does not change the plug's intended use in the Company's mining operations. Despite the denial of the FERC permit, the presence of the plug remains authorized under the Federal Mining Law.

Finally, we reiterate that for some time the inoperative plug has been no safety risk of any kind, type or nature. It should be of no concern to anyone.

In summary, the Company installed the plug to facilitate electrical generation for future mining operations. It was installed at significant expense and in accordance with the Company's rights and authorizations under the Federal Mining Law. It is located well below the surface of the Mine and poses no safety or environmental risk. In light of the foregoing, the Company requests the National Forest cease its efforts to have the plug removed and acknowledge the

[1] In both the September 9, 2014 and December 5, 2014 letters, the National Forest suggests that the plug must be authorized under a plan of operations. However, as the National Forest is aware, the plug is located underground and does not constitute a surface disturbance or impact surface resources, and therefore, it is not subject to the plan of operations requirements under either the BLM's 3809 regulations, or the Forest Service's 228 regulations.

Company's rights under the Federal Mining Law, including the right to maintain mining infrastructure such as the plug within its valid mining claims.

Please contact me if you would like to discuss the issues raised in this letter.

Best regards,

Richard R. Hall

cc: Mr. Lynn Goodfellow
Mr. Craig Rossell

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- END OF EXHIBIT E -

Application

For

An Original License

Exhibit E

Appendices

(Revised July 2016)

Pine Creek Mine
Tunnel Hydroelectric Project

FERC Project No. 12532

Prepared by:

Pine Creek Mine, LLC

In association with:

Water and Energy Consulting
HCI Hydrologic Consultants, Inc.
Sierra Geotechnical Services, Inc.
Glenn Lukos Associates, Inc.
ECORP Consulting, Inc.
Davis-King & Associates
JRP Historical Consulting
Matthew P. Gass, P.E.

Exhibit E

Appendix 1

Relevant Deed, Mining Claims and Non-Exclusive Assignment Agreement

RECORDING REQUESTED BY
Freda D. Pechner, Esq.

AND WHEN RECORDED MAIL TO:

Name: Freda D. Pechner
Address: P.O. Box 700
City & State: Garden Valley, CA
Zip: 95633

INYO, County Recorder
BEVERLY J HARRY Co Recorder Office
DOC- 2005-0003312
Check Number 7349
Friday, SEP 02, 2005 14:39:31
MIC $1.00:S21 $2.00:REC $7.00
SYS $3.00:DTC $200.20:
Ttl Pd $213.20 Nbr-0000043566
ELB/R1/1-3

ASSESSORS PARCEL NO. 9-300-02,9-300-04 & 9-300-05

SPACE ABOVE THIS LINE FOR RECORDER'S USE

GRANT DEED

The undersigned Grantor(s) declare(s) under penalty of perjury that the following is true and correct:
Documentary transfer tax is $ ~~16.50~~ 200.20
☐ Computed on full value of property conveyed, or
☒ Computed on full value less value of liens and encumbrances remaining at time of sale.
☐ Unincorporated area: ☐ City of , and

REAL PROPERTY TRANSFER TAX PAID $200.20 INYO COUNTY

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,
Pine Creek Development, LLC, a California limited liability company

hereby GRANT(S) to
Bishop Tungsten Development, LLC, a California limited liability company

the following described real property in the County of Inyo , State of California:
Legal description attached as Exhibit "A", and made a part hereof.

Dated June 20, 2005

Pine Creek Development, LLC
A California Limited Liability Company

By: Lynn Goodfellow
Manager

State of ~~California~~ Nevada
County of Clark

On June 20, 2005
before me, Karen Kay Blalock

personally appeared Lynn Goodfellow
personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

SIGNATURE

KAREN KAY BLALOCK
Notary Public, State of Nevada
Appointment No. 00-64881-1
My Appt. Expires Aug 31, 2008

Title Order No. **Escrow, Loan, or Attorney File No.**

MAIL TAX STATEMENTS TO:

Bishop Tungsten Development, LLC (NAME) P.O. Box 1538 (ADDRESS) Bishop, CA 93515 (CITY,STATE,ZIP)

NONJC-016
Martin Dean's Essential Forms ™

GRANT DEED

20050003312

EXHIBIT "A"

PARCEL 1:

MORGAN CREEK NO. 4 MILL SITE CLAIM, A PORTION OF MINERAL ENTRY PATENT 1170242 DATED APRIL 15, 1957, DESIGNATED AS SURVEY NO. 6380 B, EMBRACING A PORTION OF APPROXIMATELY SECTION EIGHT IN TOWNSHIP SEVEN SOUTH OF RANGE THIRTY EAST OF THE MOUNT DIABLO MERIDIAN, INYO COUNTY, CALIFORNIA, THE SAID CLAIM BEING MORE PARTICULARLY DESCRIBED IN THE OFFICIAL FIELD NOTES AND DEPICTED ON THE OFFICIAL PLAT WHICH WAS EXPRESSLY MADE A PART OF THE PATENT AND COPIES OF WHICH WERE ATTACHED THERETO.

PARCEL 2:

MORGAN CREEK NO. 5 MILL SITE CLAIM, MINERAL ENTRY PATENT 1170241 DATED APRIL 15, 1957, DESIGNATED AS SURVEY NO. 6381, EMBRACING A PORTION OF SECTION EIGHT IN TOWNSHIP SEVEN SOUTH OF RANGE THIRTY EAST OF THE MOUNT DIABLO MERIDIAN, INYO COUNTY, CALIFORNIA, THE SAID CLAIM BEING MORE PARTICULARLY DESCRIBED IN THE OFFICIAL FIELD NOTES AND DEPICTED ON THE OFFICIAL PLAT WHICH WAS EXPRESSLY MADE A PART OF THE PATENT AND COPIES OF WHICH WERE ATTACHED THERETO.

PARCEL 3:

MORGAN CREEK NO. 1 MILL SITE CLAIM, A PORTION OF MINERAL ENTRY PATENT 1170240 DATED APRIL 15, 1957, DESIGNATED AS SURVEY NO. 6377 B, EMBRACING A PORTION OF SECTION EIGHT IN TOWNSHIP SEVEN SOUTH OF RANGE THIRTY EAST OF THE MOUNT DIABLO MERIDIAN, INYO COUNTY, CALIFORNIA, THE SAID CLAIM BEING MORE PARTICULARLY DESCRIBED IN THE OFFICIAL FIELD NOTES AND DEPICTED ON THE OFFICIAL PLAT WHICH WAS EXPRESSLY MADE A PART OF THE PATENT AND COPIES OF WHICH WERE ATTACHED THERETO.

PARCEL 4:

MORGAN CREEK NO. 2 MILL SITE CLAIM, A PORTION OF MINERAL ENTRY PATENT 1170239 DATED APRIL 15, 1957, DESIGNATED AS SURVEY NO. 6378 B, EMBRACING A PORTION OF SECTIONS FIVE AND EIGHT IN TOWNSHIP SEVEN SOUTH OF RANGE THIRTY EAST OF THE MOUNT DIABLO MERIDIAN, INYO COUNTY, CALIFORNIA, THE SAID CLAIM BEING MORE PARTICULARLY DESCRIBED IN THE OFFICIAL FIELD NOTES AND DEPICTED ON THE OFFICIAL PLAT WHICH WAS EXPRESSLY MADE A PART OF THE PATENT AND COPIES OF WHICH WERE ATTACHED THERETO.

2 20050003312

PARCEL 5:

MORGAN CREEK NO. 3, MORGAN CREEK NO. 31, MAX MILLSITE, AND MIKE MILLSITE MILLSITE CLAIMS, MINERAL ENTRY PATENT 04-91-0004 DATED OCTOBER 24, 1990, DESIGNATED SURVEY NO. 6379B, 6880 AND 6928 EMBRACING A PORTION OF SECS. 5 AND 8, T. 7 S., R. 30 E., MOUNT DIABLO MERIDIAN (PARTIALLY SURVEYED), UNKNOWN MINING DISTRICT, INYO COUNTY, CALIFORNIA, THE SAID CLAIM BEING MORE PARTICULARLY DESCRIBED IN THE OFFICIAL FIELD NOTES AND DEPICTED ON THE OFFICIAL PLAT WHICH WERE EXPRESSLY MADE A PART OF THE PATENT AND COPIES OF WHICH WERE ATTACHED THERETO; BUT EXCLUDING AND EXCEPTING FROM SAID MORGAN CREEK NO. 3 MILLSITE CLAIM ALL THAT PORTION OF GROUND WITHIN THE BOUNDARIES OF SAID MORGAN CREEK NO. 31 MILLSITE CLAIM, SURVEY NO. 6880; AND FURTHER EXCLUDING AND EXCEPTING FROM SAID MIKE MILLSITE MILLSITE CLAIM ALL THAT PORTION OF GROUND WITHIN THE BOUNDARIES OF MORGAN CREEK NO. 2 MILLSITE CLAIM, SURVEY NO. 6378-B, AND MORGAN CREEK NO. 5 MILLSITE CLAIM, SURVEY NO. 6381; AND FURTHER EXCLUDING AND EXCEPTING FROM SAID MAX MILLSITE MILLSITE CLAIM ALL THAT PORTION OF GROUND WITHIN THE BOUNDARIES OF MORGAN CREEK NO. 5 MILLSITE CLAIM, SURVEY NO. 6381; AND FURTHER EXCLUDING AND EXCEPTING FROM SAID MORGAN CREEK NO. 31 MILLSITE CLAIM ALL THAT PORTION OF GROUND WITHIN THE BOUNDARIES OF LOT A AND LOT B, SURVEY NO. 6880.

Page Two of Two Pages

CAMC0309280

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 671 Marina Dr.
Boulder City NV 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001662-00
Check Number 036434
Monday, JUL 07, 2014 15:53:31
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Ttl Pd $20.00 Rcpt # 0000104063
DMO/R1/1-3

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Milton #1.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2x2x4 wood Post in Rock pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☒ SE ¼ ☒ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☒ NW ¼ ☒ SW ¼ ☐ SE ¼ ☐ Sec. 8 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#197 USMM 10405.05 Feet From NE Corner 1
(N 30° W 25622.82
(W 37° E 39857.36

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NW

RECEIVED
JUL 10 2014
USDI-BLM-CASO

CAMC0309278

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 671 Marina Dr.
Boulder City NV 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001663-00
Check Number 036434
Monday, JUL 07, 2014 15:53:32
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Ttl Pd $20.00 Rcpt # 0000104064
DMO/R1/1-3

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Blue Grouse #5.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood post in Rock pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☑ SW ¼ ☑ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21
NE ¼ ☐ NW ¼ ☑ SW ¼ ☑ SE ¼ ☐ Sec. 8 T. 7S R. 30E Mer. 21
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#199 USMM 7407.38 feet to corner 1 (S 68° 52' 02.4" E)
N 25,226.89
E 38,851.91

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 by 600

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NW

RECEIVED
JUL 10 2014
USDI-BLM-CASO

CAMC0309285

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001652-00
Check Number 036434
Monday, JUL 07, 2014 15:53:23
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Ttl Pd $20.00 Rcpt # 0000104053
DMO/R1/1-3

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is EASY GOING #3.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood Post in Rock pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. ____ T. ____ R. ____ Mer. ____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. ____ T. ____ R. ____ Mer. ____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. ____ T. ____ R. ____ Mer. ____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#1199 USMM 9434.64 Feet from NE CORNER 1
(N. 27,764.77 (N. 28,033.89
(E. 37,575.84 (E. 38,112.00

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction: N.E

RECEIVED
JUL 10 2014
USDI-BLM-CASO

CAMC0309284

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001658-00
Check Number 036434
Monday, JUL 07, 2014 15:53:28
MIC $1.00 S21 $2.00 REC $13.00
SYS $3.00 SST $1.00
Ttl Pd $20.00 Rcpt # 0000104059
DMO/R1/1-3

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is EASY going #1.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2x2x4 wood Post in Rockpile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☒ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#197 USMM 8028.87 Feet from NE. corner 1
(N. 22° 04' 38" W. 2713.76
E. 3757.69

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

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JUL 10 2014

N/E

CAMC0309281

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001661-00
Check Number 038434
Monday, JUL 07, 2014 15:53:31
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Ttl Pd $20.00 Rcpt # 0000104062
DMO/R1/1-3

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 629 Marina Dr.
Boulder City NV 89005

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Arthur 2

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2x2x4 Post erected with Rockpile

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☒ Sec. 31 T. 7S R. 30 E Mer. 21
NE ¼ ☐ NW ¼ ☐ SW ¼ ☒ SE ¼ ☐ Sec. 32 T. 7S R. 30E Mer. 21
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. 6 T. 7S R. 30E Mer. 21

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#197 USMM 4368.59 Feet to NE Corner 1
(N 24°) (N 30596.2
(W 17.54) (E 36356.5

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet long by 600 Feet wide

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NW

RECEIVED
JUL 10 2014
USDI-BLM-CASO

CAMC0309282

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001660-00
Check Number 036434
Monday, JUL 07, 2014 15:53:30
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Ttl Pd $20.00 Rcpt # 0000104061
DMO/R1/1-3

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Arthur #3

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood Stake with Rock pile with Aluminum Stake

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☒ SW ¼ ☐ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____
NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#197 USMM N 31°23 W 35" / 4597.60 Feet from / (NE corner 1) N 30653.2 E 36854.1

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 by 600

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NW

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USDI-BLM-CASO

CAMC0309286

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001657-00
Check Number 036434
Monday, JUL 07, 2014 15:53:27
MIC $1.00:S21 $2.00:REC $13.00
SYS $3.00:SST $1.00:
Ttl Pd $20.00 Rcpt # 0000104058
DMO/R1/1-3

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is EASY Going #4.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood post in Rock Pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☒ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#1 99 USMM 9434.64 Feet from NE CORNER 1
(S 53° E 45.9) (N 28,033.89 E 38,112.09)

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

N.

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USDI-BLM-CASO

CAMC0309287

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV. 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001656-00
Check Number 036434
Monday, JUL 07, 2014 15:53:26
MIC $1.00 S21 $2.00 REC $13.00
SYS $3.00 SST $1.00
Ttl Pd $20.00 Rcpt # 0000104057
DMO/R1/1-3

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Easy Going #6.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood Post in Rock Pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☒ SW ¼ ☒ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#199 USMM 9434.64 Feet from NE CORNER 1
(S. 53° (N 28,033.89
(E 45.9° (E 38,112.09

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NE

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JUL 10 2014
USDI-BLM-CASO

NON-EXCLUSIVE ASSIGNMENT AGREEMENT

This Non-exclusive Assignment Agreement ("Agreement") is entered into effective November 1, 2014 by and between BISHOP TUNGSTEN DEVELOPMENT, LLC, a California limited liability company ("Assignor"), and PINE CREEK MINE, LLC, a California limited liability company ("Assignee"), with regard to certain land that is part of Pine Creek Mine (Mine") near Bishop, California.

WHEREAS, Assignor has all right, title, claim, lien or interest in or to those Mine lands that concern this Agreement, whether private property or public lands subject to certain mining claims;

WHEREAS, Assignee is the owner of that certain conduit hydroelectric project lying within Mine lands known as the Tunnel Hydroelectric Facility (Facility), which project will use lands that are subject to the ownership or other rights of Assignor, including land now improved with a reinforced concrete plug inside the Easy-Go Adit; and

WHEREAS, Assignor desires that Assignee have the use of said lands to develop the project throughout the course of the project on a non-exclusive basis;

NOW, THEREFORE, for valuable consideration receipt of which is hereby acknowledged, the parties hereto do hereby agree as follows:

1. Assignment. Assignor hereby assigns to Assignee on a non-exclusive basis the right to use and improve the following parcels of land for the limited purpose of developing and operating a subterranean hydroelectric project within the Mine: (1) that land described in that certain Grant Deed dated June 20, 2005 and recorded September 2, 2005 in the Office of the County Recorder of Inyo County as Instrument No. DOC-2005-0003312; and (2) those certain mining claims known as Milton 1, Blue Grouse 1-5, Easygoing 1-6, Roadside, Arthur, Arthur 1- 4, John, John 1, San Rafael, San Rafael 1, Blizzard 1-5, Annex, Annex 1, and Annex 6-8, all of which are recorded in the Office of the County Recorder of Inyo County (the Properties).

2. Term. This Agreement shall terminate upon the earlier of fifty (50) years from the effective date of this Agreement or at such time as the Facility is being wound down or is no longer materially operable. Notwithstanding the foregoing, however, this Agreement may terminate on one (1) year's written notice in the event Assignee commits waste or otherwise materially harms the Properties in the sole discretion of Assignor.

3. Property Expenses. During the term of this Agreement, Assignor shall continue to pay all recurring expenses upon the Property, including taxes, insurance, maintenance fees on mining claims, and the like. However, Assignor shall have no liability to Assignee in connection with such expenses.

4. Indemnification. Assignee hereby agrees to indemnify and hold harmless Assignor for all claims, duties, commitments, liabilities, actions, including attorney fees, and judgments that may arise from Assignee's use of the Property.

5. Effectiveness. This Agreement shall be effective as of the date set first set forth above.

6. Governing Law; Binding Effect. This Agreement shall be governed by and construed in accordance with the laws of the State of Nevada applicable to contracts made and performed in such state without giving effect to the choice of law principles of such state that would require or permit the application of the laws of another jurisdiction.

7. Counterparts. This Agreement may be executed in one or more counterparts, including facsimile counterparts, each of which shall be deemed to be an original copy of this Agreement, and all of which, when taken together, shall be deemed to constitute one and the same agreement. Delivery of such counterparts by facsimile or electronic mail (in PDF or .tiff format) shall be deemed effective as manual delivery.

IN WITNESS WHEREOF, the Assignor and Assignee have executed this Non-exclusive Assignment Agreement as of the date set forth above.

ASSIGNEE:

PINE CREEK MINE, LLC

By: _____

Name: CRAIG ROSSELL

Title: V.P.

ASSIGNOR:

BISHOP TUNGSTEN DEVELOPMENT, LLC

By: _____

Name: LYNN Goodfellow

Title: PRES.

Exhibit E

Appendix 2

BLM Maintenance Fees on Mining Claims

Form 3830-5
(June 2014)

(1)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MAINTENANCE FEE PAYMENT FORM FOR LODE CLAIMS, MILL SITES, AND TUNNEL SITES

Remitter Name: Bishop Tungsten LLC
Mailing Address: 679 Marina Dr.
City, State, Zip: Boulder City NV 89005

☐ **Check here if this is a change of address.**

FOR COUNTY RECORDER'S USE

No. of claims/sites 10
x $155 per claim/site
Total due BLM $ 1550.-

1. The maintenance fee may be paid by cash, check, money order, Bureau of Land Management (BLM) Declining Deposit Account, or credit card (VISA, American Express, Discover, or MasterCard). Payments must be remitted to the BLM State Office where your claim or site is recorded and received on or before September 1. If the payment is mailed, the envelope must be postmarked by a bona fide delivery service on or before September 1 and received at the proper BLM State Office within 15 calendar days after the due date. Payments may also be made by telephone using a credit card. A complete listing of BLM State Offices with their addresses and phone numbers can be found at http://www.blm.gov.

2. The maintenance fee for the following claim(s)/site(s) applies to the assessment year 2016.

CLAIM/SITE NAME	BLM SERIAL NO.
Blue Grouse #2	CAMC0 309276
Blue Grouse #3	309277
Blue Grouse #6	309278
Blue Grouse #1	309279
Milton #1	309280
Arthur #2	309281
Arthur #3	309282
Tallus	309283
Easy going #1	309284
Easy going #3	309285

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AUG 17 2015
USDI BLM CASO

Use a separate sheet for additional claim/site names, serial numbers, and claimant names and addresses.

(Continued on page 2)

Form 3830-5
(June 2014)

(2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MAINTENANCE FEE PAYMENT FORM FOR LODE CLAIMS, MILL SITES, AND TUNNEL SITES

Remitter Name: Bishop Tungsten LLC
Mailing Address: 679 Marina Dr.
City, State, Zip: Boulder City NV 89005

☐ Check here if this is a change of address.

FOR COUNTY RECORDER'S USE

No. of claims/sites 10
x $155 per claim/site
Total due BLM $ 1550.-

1. The maintenance fee may be paid by cash, check, money order, Bureau of Land Management (BLM) Declining Deposit Account, or credit card (VISA, American Express, Discover, or MasterCard). Payments must be remitted to the BLM State Office where your claim or site is recorded and received on or before September 1. If the payment is mailed, the envelope must be postmarked by a bona fide delivery service on or before September 1 and received at the proper BLM State Office within 15 calendar days after the due date. Payments may also be made by telephone using a credit card. A complete listing of BLM State Offices with their addresses and phone numbers can be found at http://www.blm.gov.

2. The maintenance fee for the following claim(s)/site(s) applies to the assessment year 2016.

CLAIM/SITE NAME	BLM SERIAL NO.
Easygoing #4	CAMC0309286
Easygoing #6	309287
Brownstone #1	309288
Brownstone #2	309289
Myrtle #1	309290
Roadside	309291
Snowshed #1	309367
Snowshed #2	309368
Tungsten #1	310691
Tungsten #2	310692

RECEIVED
AUG 17 2015
BLM-CASO

Use a separate sheet for additional claim/site names, serial numbers, and claimant names and addresses.

(Continued on page 2)

Form 3830-5
(June 2014)

(3)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MAINTENANCE FEE PAYMENT FORM FOR LODE CLAIMS, MILL SITES, AND TUNNEL SITES

Remitter Name: Bishop Tungsten LLC
Mailing Address: 679 Marina Dr.
City, State, Zip: Boulder City NV 89005

☐ **Check here if this is a change of address.**

FOR COUNTY RECORDER'S USE

No. of claims/sites 3
x $155 per claim/site
Total due BLM $ 465.-

1. The maintenance fee may be paid by cash, check, money order, Bureau of Land Management (BLM) Declining Deposit Account, or credit card (VISA, American Express, Discover, or MasterCard). Payments must be remitted to the BLM State Office where your claim or site is recorded and received on or before September 1. If the payment is mailed, the envelope must be postmarked by a bona fide delivery service on or before September 1 and received at the proper BLM State Office within 15 calendar days after the due date. Payments may also be made by telephone using a credit card. A complete listing of BLM State Offices with their addresses and phone numbers can be found at http://www.blm.gov.

2. The maintenance fee for the following claim(s)/site(s) applies to the assessment year 2016.

CLAIM/SITE NAME	BLM SERIAL NO.
Tungsten #3	CAMC0310693
Tungsten #4	310694
Tungsten #5	310695

RECEIVED
AUG 17 2015
UCDI-BLM-CASO

Use a separate sheet for additional claim/site names, serial numbers, and claimant names and addresses.

(Continued on page 2)

Exhibit E

Appendix 3

Response Of Sierra Geotechnical To FERC Comments 9 and 10

SIERRA GEOTECHNICAL SERVICES INC.

ENVIRONMENTAL • GEOTECHNICAL • GEOLOGY • MATERIALS TESTING • INSPECTION

May 18, 2015 Project No. 3.31321

Pine Creek Mine LLC
228 West Bonita Avenue
Claremont, California 91711

Attention: Mr. Craig Rossell

Subject: **RESPONSE TO FERC COMMENTS**
Pine Creek Mine
Pine Creek, Inyo County, California

Dear Mr. Rossell:

The following response is provided pursuant to the Deficiencies and Information Request Letter prepared by the Federal Energy Regulatory Commission, regarding the application for the Pine Creek Tunnel Hydroelectric Project P-12532-006, dated April 8th, 2016. Specifically, this letter addresses Comments 9 and 10 on Pages B-2 to B-3, of the Concrete Plug and Project Discharges Section.

Comment 9: *An unexpected release of approximately 200 acre-feet of water under 1,320 feet of head has the potential to cause serious damage to any structures downstream. Please specify the expected discharge from the project should the plug fail during project operation. Please also provide a description of the probable zone of inundation that would be flooded if the concrete plug failed, including any structures that would be located within the inundation zone.*

In response, initially we find the probability of an instantaneous and complete failure of the tunnel plug, to be very low. The plug was engineered to withstand a design level earthquake event. The plug location was chosen because of the quality of the rock mass, which is monolithic, impermeable and has little to no jointing and fracturing. The plug is capable of withstanding a pressure force of 867 psi (Nasser 2002). Impound test data from 2003 showed water levels reached a maximum recorded height of approximately 1,219 feet of head (528 psi, 250 acre feet), which is approximately 281 feet below the maximum impoundment height where water can exit to daylight from the adit 1,500 feet above the bulkhead. The pressure force will not exceed the design parameters.

The plug is adequate in length, the walls were well roughened, the stress in the rock is applied uniformly, and the tunnel walls in the area of the plug are tapered, putting much of the contact area into compression. In addition, there is redundancy in the resistance to failure available in the plug configuration. Both longitudinal shear and wedging blowout tension are resisting the downstream movement of the plug. These two resistive mechanisms may be assumed to share the applied load.

Even in the event of a greater than design level earthquake, the likelihood of catastrophic failure is remote. The plug is anchored in quartz diorite (granite) along a solid part of the adit, with very limited fracturing. However, if somehow the plug did fail during a larger than designed event, it's likely that the water flow and velocities would be impeded/suppressed by dislodged rock from heavily fractured areas upstream and downstream of the plug; fallen rock would create a partial dam effect, thus limiting the amount of water flow. Please see the SGSI report titled *Seismic, and Geotechnical Study - Easy Go Adit Tunnel Plug, Pine Creek Mine (*enclosed), for further discussion of the geologic, seismic and structural design of the tunnel plug.

That said, included below are flow rate, velocity, depth, and time period analyses in the event of an instantaneous and complete failure of the tunnel plug (worst case scenario) and release of the 250 acre-feet of impounded water. It is assumed that there is no loss or infiltration of the runoff volume as it travels downstream.

In this worst case scenario, the initial runoff rate is calculated via a HecRas Model from the mine to just past the town of Rovana (approximately 38,000 ft). The initial calculated flow rate exiting the EZ-Go Adit would be approximately 14,143 cubic feet per second (cfs) with a velocity of 89 feet per second (ft/s). Both the rate and velocity quickly drop, however, as water empties from the mine. The total time of release is approximately 23 minutes due to the relatively low volume of impounded water, which is approximately two hundred fifty acre-feet or equivalent to 126 Olympic sized swimming pools.

Downstream flow velocities would rapidly dissipate from approximately 14 to 18 fps in the vicinity of the tailings and Pack Station, to approximately 10 fps in the vicinity of Rovana. Breach water stays primarily within the relatively well incised Pine Creek drainage. The width of the flow is estimated at less than 200 feet in the drainage. Depth of the flow is partly controlled by topography and varies from approximately 12 feet at the mine area to approximately 5 feet near Rovana. The flow path is outlined in blue in the Figures.

The initial high velocities would likely lead to severe erosion within and outside the tunnel and damage to structures directly below the opening and at the mine site. Water would also impact the Pack Station parking area and large portions of Pine Creek Road. Near Station 190 the bridge crossing would likely be damaged. Water skirts the edges of the tailing piles and may pick up additional debris. Liquefaction of the tailings piles though is considered low. At Rovana, the flow appears to just miss the homes on the southern edge of the bluff.

SIERRA GEOTECHNICAL SERVICES INC

SGSI Job No. 3.31321
May, 2016

Again we stress that the modeling was based on a worst case scenario which is unlikely to occur. Overall in a real world scenario, where the plug would be damaged but would remain in largely in place, failure would be significantly less than that modelled here.

It is important to note that this analysis was performed on available USGS mapping and that further analysis could be performed with local aerial or ground topography to develop a more accurate model, if needed. The results would more accurately locate the precise edges of flow and velocities, but since the likelihood of this type of breach is so low, this analysis gives a reasonably accurate indication of potential damages.

Comment 10: *Your application states that the maximum head on the project would be 1,320 feet Please provide a description of what would happen should water levels in the mine rise above 1,320 feet, including where the water would exit the mine.*

Prior to the advancement of the EZ-Go adit in the 1960's, at an elevation of roughly 8,000 feet, the potentiometric surface of groundwater was at about 9,500 feet (HCI, 1990), which is the approximate level of the 1500 or Zero adit. The levels above the Zero adit - "A" level and higher (11,000 feet and above) - were essentially dry. Therefore, we can assume that the point of equilibrium for groundwater is likely somewhere between the Zero and "A" levels, if not closer to the Zero adit.

The approximated point of equilibrium is further validated by the recorded water height following impoundment in 2002/2003. Impounded water reached a recorded high of 9319 feet or just below the Zero adit. Though this height was measured prior to the snowpack runoff period, it is likely that water levels would not substantially rise past the Zero level, given the data. However, if water were to somehow exceed this level, it would most likely exit the mine though the Zero adit.

If we can address any questions or comments or any party would like to discuss any inadequacies they feel may exist they may contact me directly. We appreciate the opportunity to be of service to you.

Respectfully,

SIERRA GEOTECHNICAL SERVICES, INC.

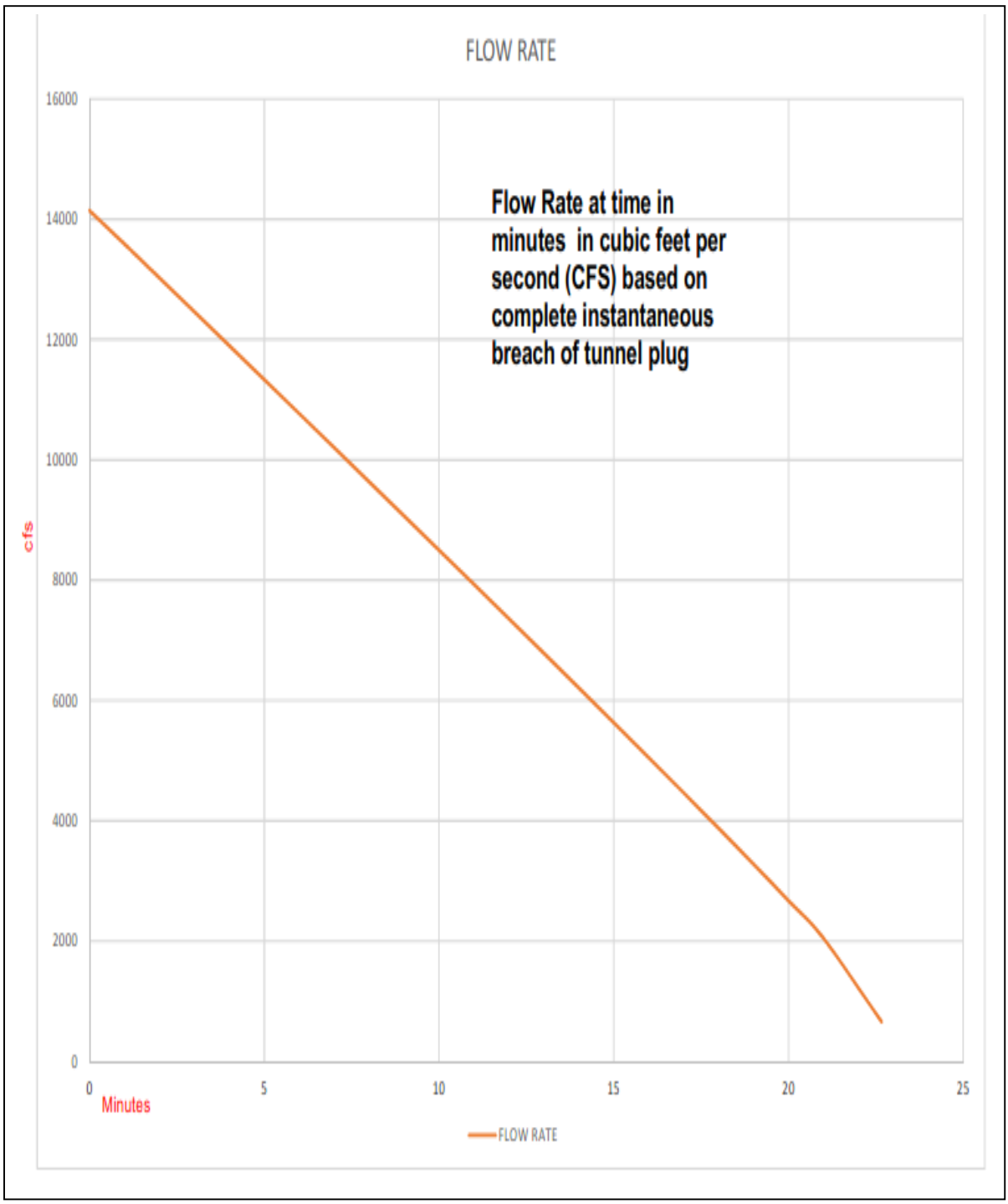
Joseph A. Adler
CEG 2198

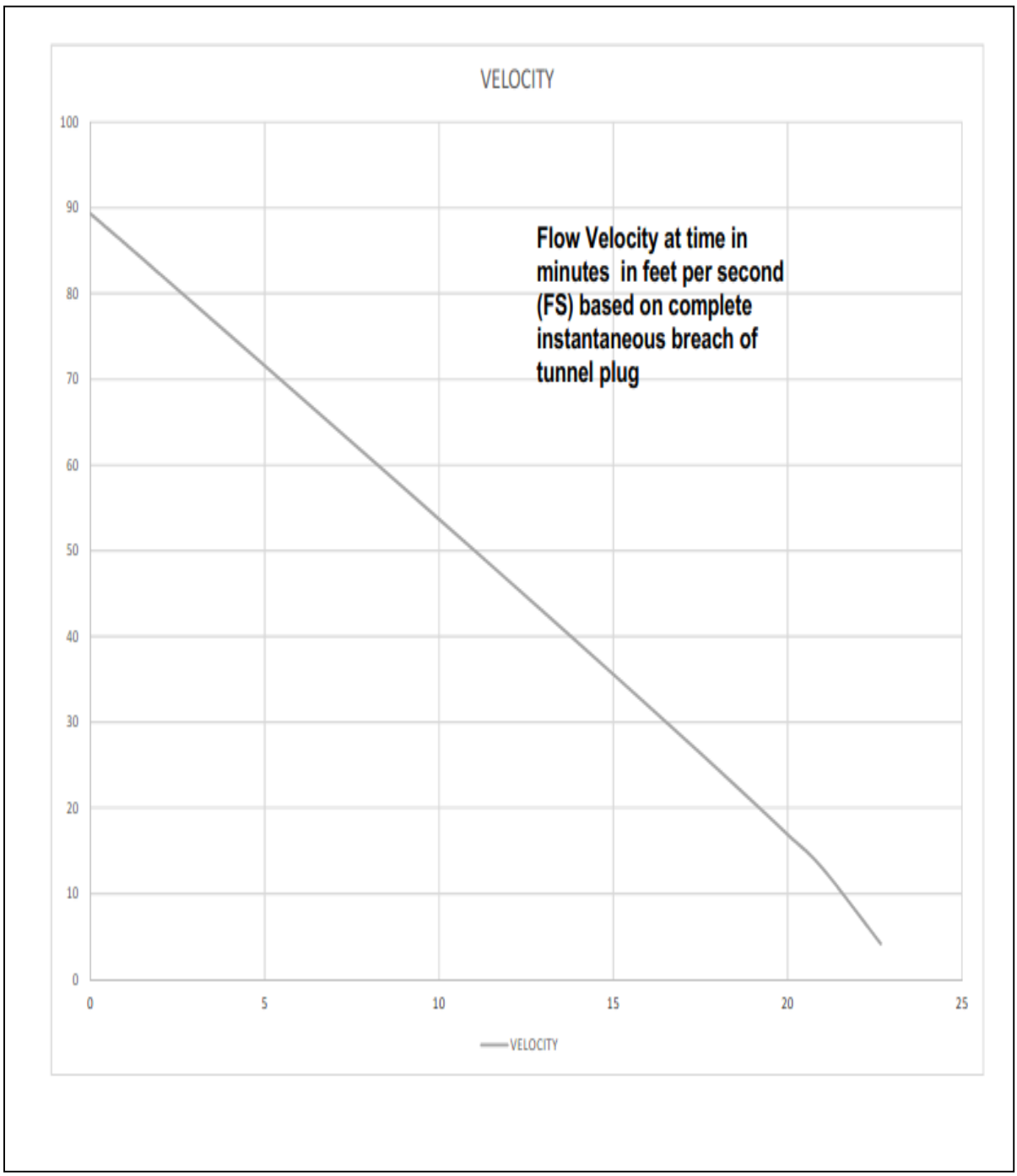
Thomas A. Platz
PE C41039

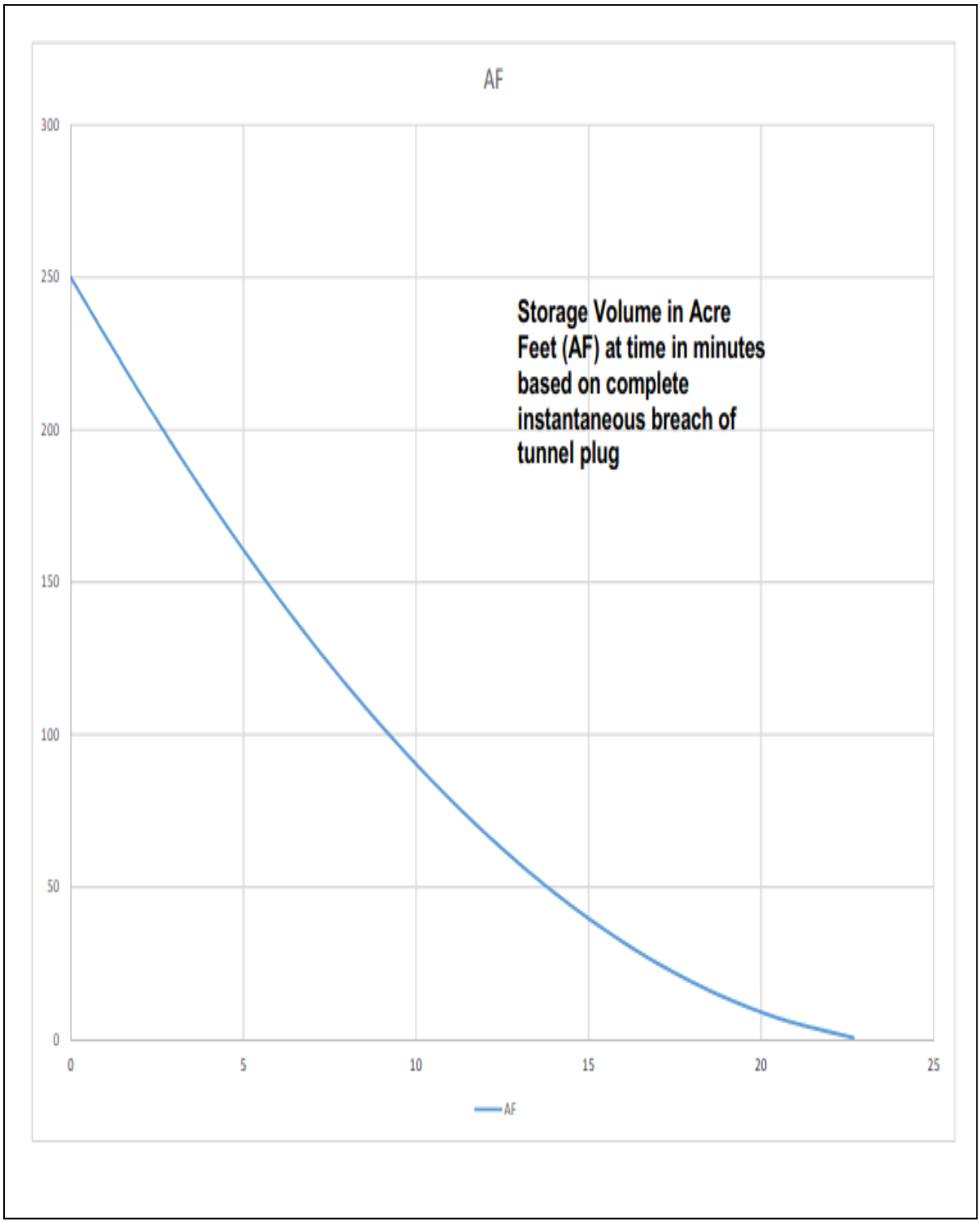
Enclosure: *Seismic, and Geotechnical Study - Easy Go Adit Tunnel Plug, Pine Creek Mine (SGSI, 2011)*

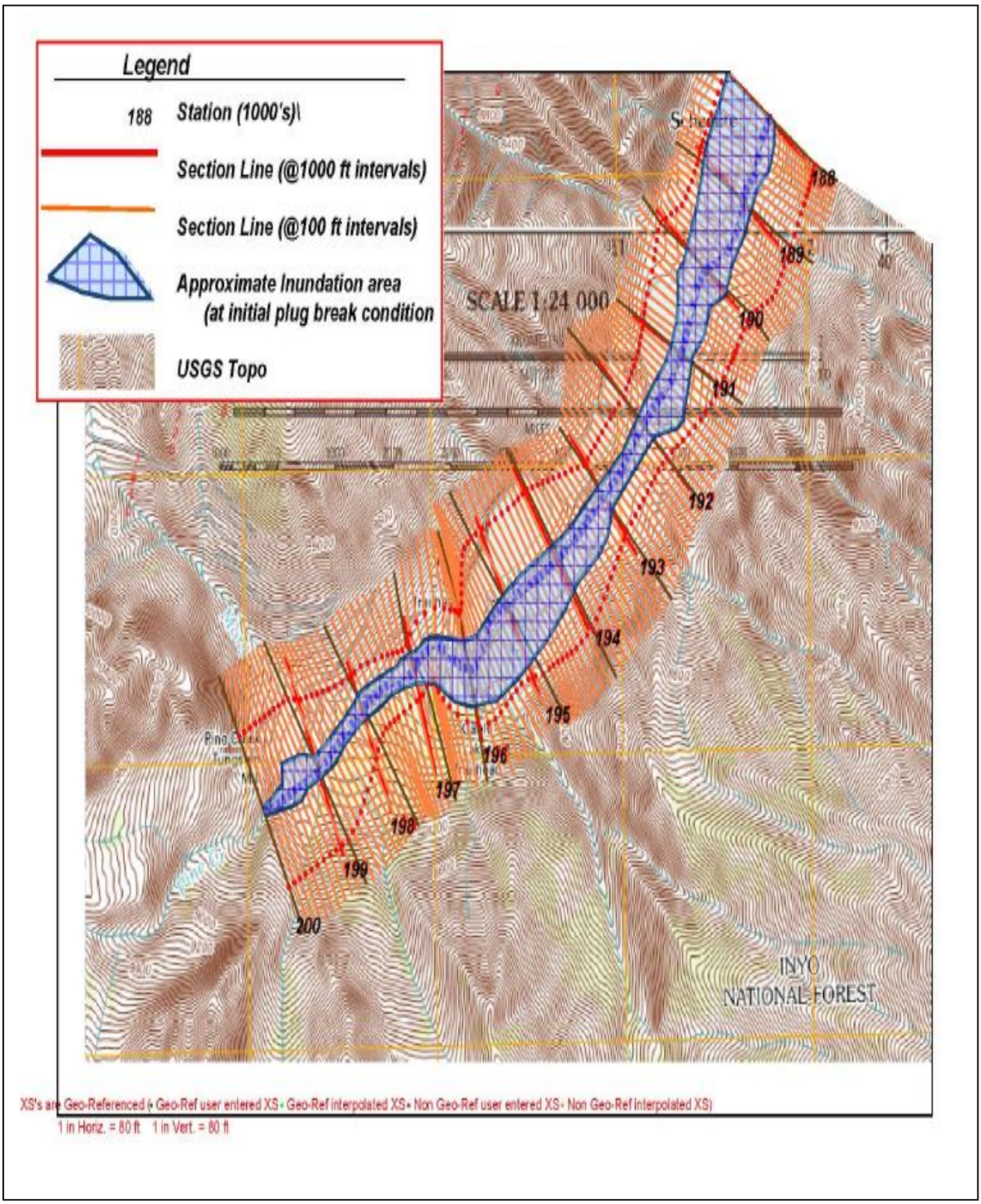
time																							
	minutes	0	0.02	0.05	0.10	0.17	0.33	0.67	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.67
	seconds	0	1	2	3	4	10	20	20	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	100
volume		0	14143	28268	42396	56352	140511	279179	275681	815349	761588	747795	713968	680103	646195	612241	578235	544169	510037	475827	441529	407127	372601	337925	303065	267971	232571	196750	160314	204804
flow rate			14143	14124	14115	14088	14051	13959	13774	13589	13026	12463	11899	11335	10770	10204	9637	9069	8501	7930	7359	6785	6210	5632	5051	4466	3876	3279	2672	2048	658
velocity			89	89	89	89	89	88	87	86	82	79	75	72	68	64	61	57	54	50	46	43	39	36	32	28	24	21	17	13	4
Width	feet		12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58
height	feet		12.38	12.38	12.38	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58	12.58
Area	sf		158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
R			3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
n			0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Hydraulic slope			0.451	0.451	0.460	0.448	0.446	0.440	0.428	0.417	0.383	0.351	0.320	0.290	0.262	0.235	0.210	0.186	0.163	0.142	0.122	0.104	0.087	0.072	0.058	0.045	0.034	0.026	0.016	0.009	0.001
Channel Length	feet		2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Hydraulic depth	feet		1219	1217	1214	1210	1203	1187	1156	1125	1034	947	863	783	707	635	566	501	440	383	330	281	235	193	155	122	92	66	44	26	3
Pressure head	psi		525	525	523	521	519	512	498	485	446	408	372	338	305	274	244	216	190	165	142	121	101	83	67	52	39	28	19	11	1
Water Volume	AF		250	250	249	248	247	244	237	231	212	194	177	161	145	130	116	103	90	79	68	58	48	40	32	25	19	13	9	5	1
	CF	10890000	10875857	10847889	10805043	10748891	10608380	10282601	10053719	9238371	8456783	7708888	6995020	6314917	5668722	5056480	4478245	3934076	3424040	2948212	2506683	2099556	1726955	1389130	1085965	817994	585423	388673	228359	23555

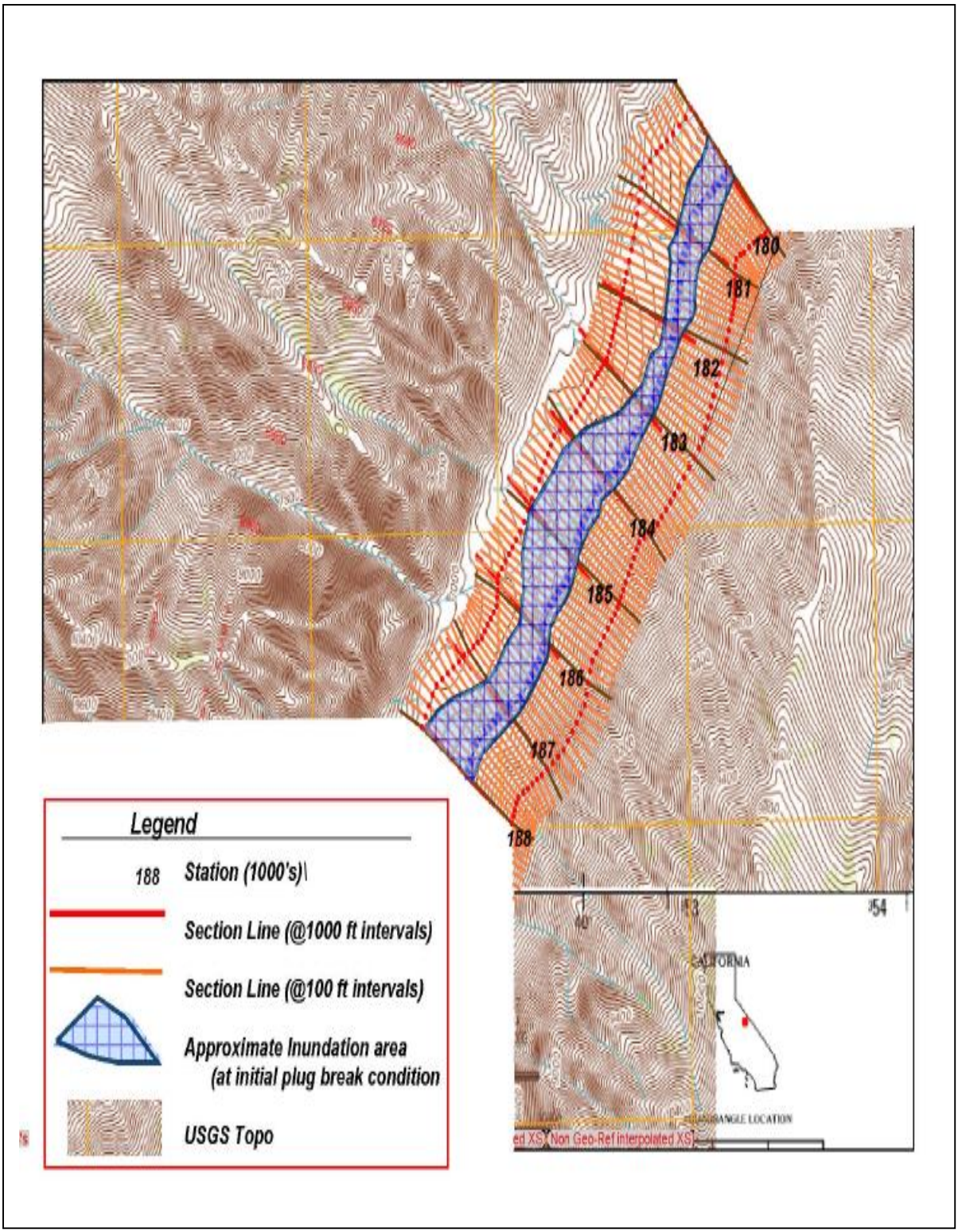
Graph	TIME	0	0.0166667	0.05	0.1	0.1666667	0.3333333	0.6666667	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22.66667
	AF	250	249.67533	249.02638	248.05424	246.76059	243.5349	237.12892	230.80164	212.0838	194.141	176.974	160.5836	144.9705	130.1359	116.0808	102.8064	90.31096	78.60513	67.68164	57.54552	48.11917	39.64944	31.88774	24.93033	18.77856	13.43947	8.922704	5.242395	3.540751
	FLOW RATE	14143	14134	14115	14088	14051	13959	13774	13589	13026	12463	11899	11335	10770	10204	9637	9069	8501	7930	7359	6785	6210	5632	5051	4466	3876	3279	2672	2048	658
	VELOCITY	89	89	89	89	89	88	87	86	82	79	75	72	68	64	61	57	54	50	46	43	39	36	32	28	24	21	17	13	4

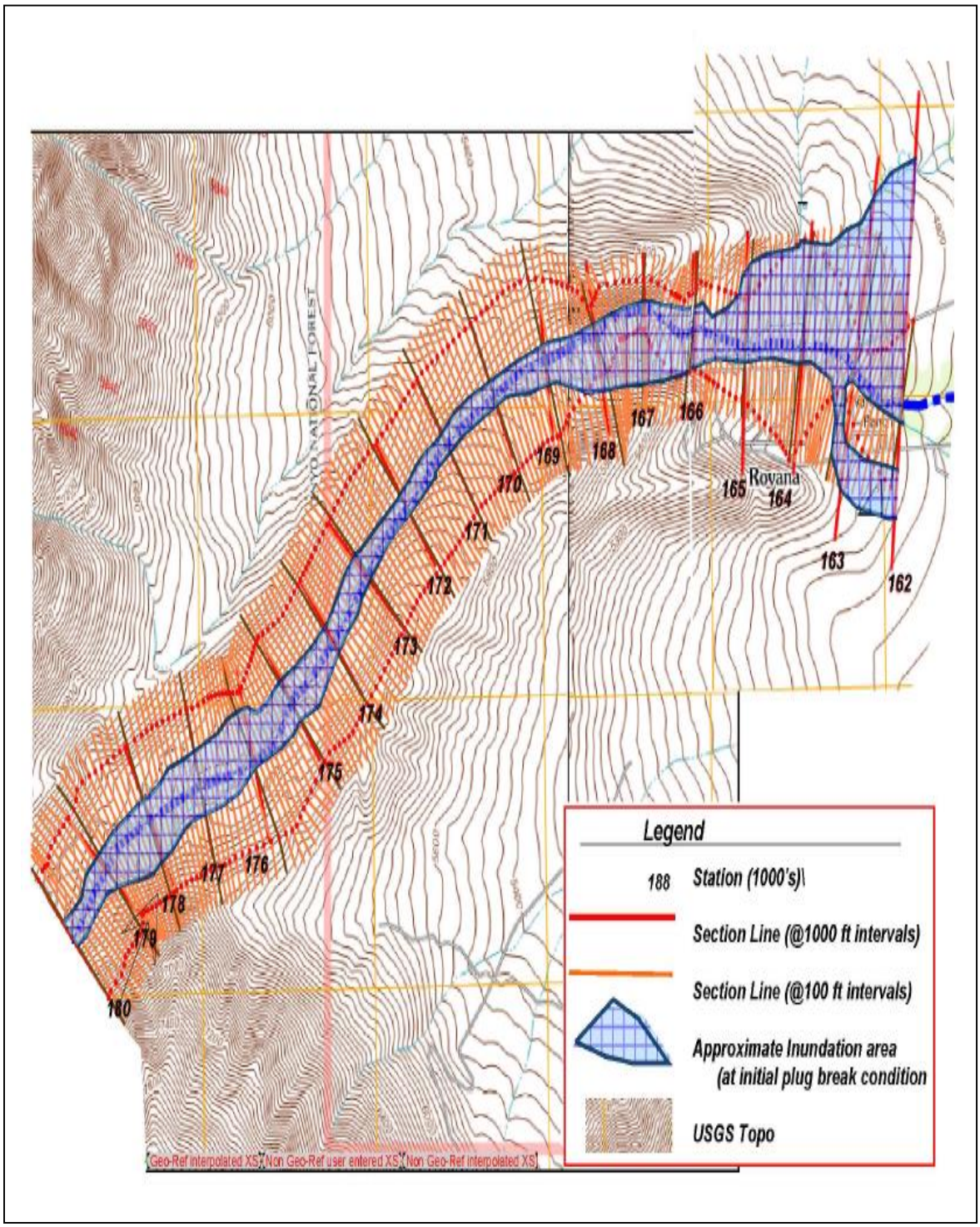

FLOW RATE
16000
14000
12000
10000
8000
6000
4000
2000
0
cfs
0
5
10
15
20
25
Minutes
Flow Rate at time in minutes in cubic feet per second (CFS) based on complete instantaneous breach of tunnel plug
FLOW RATE


VELOCITY
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
VELOCITY
Flow Velocity at time in minutes in feet per second (FS) based on complete instantaneous breach of tunnel plug


AF
300
250
200
150
100
50
0
0
5
10
15
20
25
Storage Volume in Acre Feet (AF) at time in minutes based on complete instantaneous breach of tunnel plug
AF


Legend
188 Station (1000's)\
Section Line (@1000 ft intervals)
Section Line (@100 ft intervals)
Approximate Inundation area
(at initial plug break condition
USGS Topo
SCALE 1:24 000
188
189
190
191
192
193
194
195
196
197
198
199
200
INYO
NATIONAL FOREST
XS's are Geo-Referenced (+ Geo-Ref user entered XS+ Geo-Ref interpolated XS+ Non Geo-Ref user entered XS+ Non Geo-Ref interpolated XS)
1 in Horiz. = 80 ft 1 in Vert. = 80 ft


180
181
182
183
184
185
186
187
188
Legend
188 Station (1000's)\
Section Line (@1000 ft intervals)
Section Line (@100 ft intervals)
Approximate Inundation area
(at initial plug break condition
USGS Topo
CALIFORNIA
Non Geo-Ref interpolated XS


Legend
188 Station (1000's)
Section Line (@1000 ft intervals)
Section Line (@100 ft intervals)
Approximate Inundation area
(at initial plug break condition
USGS Topo
Rovana
Geo-Ref interpolated XS
Non Geo-Ref user entered XS
Non Geo-Ref interpolated XS

HEC-RAS Plan: Plan 02 River: Pine Creek Reach: 1 Profile: Initial

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	200	Initial	14143.00	7920.00	7932.73	7932.73	7935.95	0.045993	14.40	982.22	154.33	1.01
1	199	Initial	14143.00	7840.00	7851.20	7852.48	7856.05	0.081318	17.67	800.20	142.85	1.32
1	198	Initial	14143.00	7720.00	7731.26	7733.49	7738.27	0.117732	21.24	665.84	118.25	1.58
1	197	Initial	14143.00	7560.00	7569.49	7572.02	7577.30	0.163024	22.43	630.52	132.87	1.81
1	196	Initial	14143.00	7420.00	7426.77	7428.22	7431.26	0.145605	17.01	831.70	245.90	1.63
1	195	Initial	14143.00	7320.00	7329.07	7330.41	7333.67	0.101230	17.21	821.85	181.22	1.42
1	194	Initial	14143.00	7240.00	7252.35	7253.65	7257.49	0.076321	18.19	777.35	125.85	1.29
1	193	Initial	14143.00	7160.00	7170.11	7171.32	7174.61	0.085925	17.02	830.85	164.33	1.33
1	192	Initial	14143.00	7120.00	7132.79	7132.79	7136.01	0.045560	14.41	981.59	153.49	1.00
1	191	Initial	14143.00	7040.00	7053.77	7050.90	7054.85	0.013698	8.34	1695.27	246.18	0.56
1	190	Initial	14143.00	7020.00	7033.78	7033.78	7037.26	0.044740	14.97	944.74	137.08	1.00
1	189	Initial	14143.00	6960.00	6973.08	6973.78	6977.37	0.059187	16.63	850.63	130.07	1.15
1	188	Initial	14143.00	6900.00	6913.04	6913.78	6917.38	0.060067	16.72	845.93	129.71	1.15
1	187	Initial	14143.00	6850.00	6863.31	6863.78	6867.31	0.053901	16.05	881.00	132.37	1.10
1	186	Initial	14143.00	6800.00	6813.31	6813.79	6817.31	0.053912	16.05	880.93	132.37	1.10
1	185	Initial	14143.00	6720.00	6732.36	6733.79	6737.74	0.080094	18.62	759.41	122.90	1.32
1	184	Initial	14143.00	6640.00	6652.36	6653.79	6657.74	0.080094	18.62	759.41	122.90	1.32
1	183	Initial	14143.00	6560.00	6572.36	6573.79	6577.74	0.080094	18.62	759.41	122.90	1.32
1	182	Initial	14143.00	6480.00	6492.36	6493.79	6497.74	0.080094	18.62	759.41	122.90	1.32
1	181	Initial	14143.00	6400.00	6412.36	6413.79	6417.74	0.080094	18.62	759.41	122.90	1.32
1	180	Initial	14143.00	6280.00	6291.46	6293.79	6298.75	0.119981	21.67	652.62	113.93	1.60
1	179	Initial	14143.00	6160.00	6171.46	6173.79	6178.75	0.119871	21.66	652.84	113.95	1.59
1	178	Initial	14143.00	6080.00	6092.36	6093.79	6097.74	0.080077	18.62	759.47	122.90	1.32
1	177	Initial	14143.00	6000.00	6012.36	6013.79	6017.74	0.080077	18.62	759.47	122.90	1.32
1	176	Initial	14143.00	5940.00	5953.02	5953.79	5957.39	0.060634	16.78	842.96	129.48	1.16
1	175	Initial	14143.00	5840.00	5851.85	5853.79	5858.22	0.100027	20.24	698.68	117.88	1.47
1	174	Initial	14143.00	5750.00	5762.09	5763.79	5767.97	0.090012	19.46	726.88	120.24	1.39
1	173	Initial	14143.00	5700.00	5713.31	5713.79	5717.31	0.053901	16.05	881.00	132.37	1.10
1	172	Initial	14143.00	5645.00	5658.26	5658.79	5662.33	0.055109	16.19	873.71	131.82	1.11
1	171	Initial	14143.00	5550.00	5561.97	5563.79	5568.09	0.095038	19.86	712.22	119.02	1.43
1	170	Initial	14143.00	5500.00	5513.31	5513.79	5517.31	0.053901	16.05	881.00	132.37	1.10
1	169	Initial	14143.00	5438.00	5450.97	5451.78	5455.41	0.061836	16.90	836.77	129.01	1.17
1	168	Initial	14143.00	5360.00	5369.36	5370.49	5373.54	0.088172	16.41	862.10	184.18	1.34
1	167	Initial	14143.00	5295.00	5300.65	5301.11	5303.01	0.084635	12.34	1150.28	381.60	1.23
1	166	Initial	14143.00	5215.00	5225.80	5226.56	5229.29	0.076561	14.99	943.51	206.98	1.24
1	165	Initial	14143.00	5140.00	5149.02	5149.76	5152.44	0.075897	14.86	951.88	211.14	1.23
1	164	Initial	14143.00	5090.00	5096.55	5096.55	5097.89	0.056926	9.28	1523.29	552.56	0.99
1	163	Initial	14143.00	5030.00	5035.57	5035.57	5037.01	0.056574	9.65	1464.84	2798.37	0.99
1	162	Initial	14143.00	4975.00	4978.25	4978.25	4979.06	0.071392	7.32	1932.94	1189.50	1.01

HEC-RAS Plan: Plan 02 River: Pine Creek Reach: 1 Profile: 1 min

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	200	1 min	13589.00	7920.00	7932.53	7932.53	7935.70	0.046149	14.27	952.01	151.94	1.00
1	199	1 min	13589.00	7840.00	7851.04	7852.28	7855.79	0.081255	17.49	776.79	140.74	1.31
1	198	1 min	13589.00	7720.00	7731.09	7733.28	7737.96	0.117758	21.03	646.12	116.48	1.57
1	197	1 min	13589.00	7560.00	7569.35	7571.82	7577.01	0.163111	22.21	611.78	130.88	1.81
1	196	1 min	13589.00	7420.00	7426.66	7428.09	7431.07	0.145602	16.84	807.15	242.24	1.63
1	195	1 min	13589.00	7320.00	7328.94	7330.26	7333.44	0.101281	17.04	797.43	178.51	1.42
1	194	1 min	13589.00	7240.00	7252.17	7253.44	7257.21	0.076398	18.02	754.12	123.96	1.29
1	193	1 min	13589.00	7160.00	7169.96	7171.14	7174.37	0.085835	16.85	806.64	161.91	1.33
1	192	1 min	13589.00	7120.00	7132.59	7132.59	7135.76	0.045857	14.30	950.29	151.02	1.00
1	191	1 min	13589.00	7040.00	7053.55	7050.73	7054.62	0.013782	8.28	1641.49	242.25	0.56
1	190	1 min	13589.00	7020.00	7033.57	7033.57	7036.99	0.044957	14.85	915.19	134.92	1.00
1	189	1 min	13589.00	6960.00	6972.89	6973.57	6977.09	0.059111	16.45	825.91	128.17	1.14
1	188	1 min	13589.00	6900.00	6912.85	6913.57	6917.10	0.060088	16.55	820.85	127.77	1.15
1	187	1 min	13589.00	6850.00	6863.12	6863.57	6867.04	0.053768	15.88	855.78	130.46	1.09
1	186	1 min	13589.00	6800.00	6813.12	6813.57	6817.04	0.053768	15.88	855.78	130.46	1.09
1	185	1 min	13589.00	6720.00	6732.18	6733.57	6737.45	0.080035	18.43	737.19	121.09	1.32
1	184	1 min	13589.00	6640.00	6652.18	6653.57	6657.45	0.080035	18.43	737.19	121.09	1.32
1	183	1 min	13589.00	6560.00	6572.18	6573.57	6577.45	0.080035	18.43	737.19	121.09	1.32
1	182	1 min	13589.00	6480.00	6492.18	6493.57	6497.45	0.080035	18.43	737.19	121.09	1.32
1	181	1 min	13589.00	6400.00	6412.18	6413.57	6417.45	0.080035	18.43	737.19	121.09	1.32
1	180	1 min	13589.00	6280.00	6291.29	6293.57	6298.44	0.119981	21.46	633.35	112.23	1.59
1	179	1 min	13589.00	6160.00	6171.29	6173.57	6178.43	0.119871	21.45	633.56	112.25	1.59
1	178	1 min	13589.00	6080.00	6092.18	6093.57	6097.45	0.079932	18.42	737.54	121.12	1.32
1	177	1 min	13589.00	6000.00	6012.18	6013.57	6017.45	0.080018	18.43	737.25	121.09	1.32
1	176	1 min	13589.00	5940.00	5952.82	5953.57	5957.11	0.060787	16.63	817.30	127.50	1.16
1	175	1 min	13589.00	5840.00	5851.68	5853.57	5857.91	0.099891	20.03	678.40	116.16	1.46
1	174	1 min	13589.00	5750.00	5761.91	5763.57	5767.67	0.090045	19.27	705.32	118.44	1.39
1	173	1 min	13589.00	5700.00	5713.13	5713.57	5717.03	0.053619	15.86	856.67	130.53	1.09
1	172	1 min	13589.00	5645.00	5658.06	5658.57	5662.05	0.055122	16.03	847.83	129.86	1.11
1	171	1 min	13589.00	5550.00	5561.79	5563.57	5567.79	0.095026	19.66	691.22	117.25	1.43
1	170	1 min	13589.00	5500.00	5513.13	5513.57	5517.03	0.053619	15.86	856.67	130.53	1.09
1	169	1 min	13589.00	5438.00	5450.78	5451.57	5455.13	0.061796	16.73	812.26	127.10	1.17
1	168	1 min	13589.00	5360.00	5369.23	5370.33	5373.32	0.087970	16.23	837.37	181.52	1.33
1	167	1 min	13589.00	5295.00	5300.57	5301.01	5302.86	0.085111	12.17	1120.00	379.42	1.23
1	166	1 min	13589.00	5215.00	5225.66	5226.41	5229.08	0.076730	14.84	915.99	204.44	1.24
1	165	1 min	13589.00	5140.00	5148.88	5149.61	5152.24	0.075883	14.71	923.84	208.01	1.23
1	164	1 min	13589.00	5090.00	5096.46	5096.46	5097.78	0.057872	9.22	1473.89	547.01	0.99
1	163	1 min	13589.00	5030.00	5035.46	5035.46	5036.90	0.058422	9.63	1410.97	2786.74	1.00
1	162	1 min	13589.00	4975.00	4978.20	4978.20	4979.02	0.071742	7.26	1872.43	1170.74	1.01

HEC-RAS Plan: Plan 02 River: Pine Creek Reach: 1 Profile: 5 min

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	200	5 min	11335.00	7920.00	7931.66	7931.66	7934.60	0.047216	13.76	823.84	141.34	1.00
1	199	5 min	11335.00	7840.00	7850.32	7851.43	7854.65	0.081082	16.70	678.54	131.54	1.30
1	198	5 min	11335.00	7720.00	7730.36	7732.34	7736.64	0.117940	20.11	563.62	108.79	1.56
1	197	5 min	11335.00	7560.00	7568.74	7571.00	7575.73	0.162826	21.21	534.32	122.32	1.79
1	196	5 min	11335.00	7420.00	7426.23	7427.52	7430.24	0.145336	16.08	704.98	226.39	1.61
1	195	5 min	11335.00	7320.00	7328.35	7329.55	7332.47	0.101340	16.29	695.86	166.75	1.41
1	194	5 min	11335.00	7240.00	7251.36	7252.49	7255.98	0.076689	17.25	657.27	115.72	1.28
1	193	5 min	11335.00	7160.00	7169.32	7170.38	7173.33	0.085387	16.07	705.43	151.42	1.31
1	192	5 min	11335.00	7120.00	7131.71	7131.71	7134.66	0.046963	13.79	822.05	140.46	1.00
1	191	5 min	11335.00	7040.00	7052.60	7049.98	7053.59	0.014130	7.99	1419.38	225.26	0.56
1	190	5 min	11335.00	7020.00	7032.62	7032.62	7035.80	0.046063	14.32	791.55	125.47	1.00
1	189	5 min	11335.00	6960.00	6972.06	6972.62	6975.87	0.058520	15.66	723.59	119.96	1.12
1	188	5 min	11335.00	6900.00	6912.00	6912.62	6915.89	0.060085	15.82	716.47	119.37	1.14
1	187	5 min	11335.00	6850.00	6862.29	6862.62	6865.83	0.053070	15.10	750.61	122.18	1.07
1	186	5 min	11335.00	6800.00	6812.30	6812.62	6815.83	0.052767	15.07	752.22	122.31	1.07
1	185	5 min	11335.00	6720.00	6731.38	6732.62	6736.19	0.079914	17.61	643.80	113.16	1.30
1	184	5 min	11335.00	6640.00	6651.38	6652.62	6656.20	0.080060	17.62	643.36	113.12	1.30
1	183	5 min	11335.00	6560.00	6571.38	6572.62	6576.20	0.080060	17.62	643.36	113.12	1.30
1	182	5 min	11335.00	6480.00	6491.38	6492.62	6496.20	0.080060	17.62	643.36	113.12	1.30
1	181	5 min	11335.00	6400.00	6411.38	6412.62	6416.20	0.080060	17.62	643.36	113.12	1.30
1	180	5 min	11335.00	6280.00	6290.55	6292.62	6297.07	0.119929	20.50	552.89	104.86	1.57
1	179	5 min	11335.00	6160.00	6170.54	6172.62	6177.07	0.119989	20.51	552.79	104.85	1.57
1	178	5 min	11335.00	6080.00	6091.37	6092.62	6096.20	0.080097	17.62	643.25	113.11	1.30
1	177	5 min	11335.00	6000.00	6011.38	6012.62	6016.20	0.080042	17.62	643.41	113.12	1.30
1	176	5 min	11335.00	5940.00	5951.96	5952.62	5955.90	0.061232	15.93	711.40	118.95	1.15
1	175	5 min	11335.00	5840.00	5850.91	5852.62	5856.61	0.100061	19.16	591.75	108.49	1.45
1	174	5 min	11335.00	5750.00	5761.13	5762.62	5766.39	0.089987	18.41	615.77	110.67	1.38
1	173	5 min	11335.00	5700.00	5712.29	5712.62	5715.83	0.053093	15.10	750.49	122.17	1.07
1	172	5 min	11335.00	5645.00	5657.21	5657.62	5660.84	0.054872	15.29	741.27	121.42	1.09
1	171	5 min	11335.00	5550.00	5561.02	5562.62	5566.50	0.094966	18.78	603.46	109.55	1.41
1	170	5 min	11335.00	5500.00	5512.29	5512.62	5515.83	0.053093	15.10	750.49	122.17	1.07
1	169	5 min	11335.00	5438.00	5449.95	5450.62	5453.91	0.061486	15.96	710.30	118.86	1.15
1	168	5 min	11335.00	5360.00	5368.64	5369.60	5372.34	0.086800	15.43	734.55	170.01	1.31
1	167	5 min	11335.00	5295.00	5300.24	5300.62	5302.25	0.086475	11.38	996.42	370.43	1.21
1	166	5 min	11335.00	5215.00	5225.06	5225.76	5228.20	0.077721	14.16	800.30	193.41	1.23
1	165	5 min	11335.00	5140.00	5148.29	5148.94	5151.37	0.076190	14.08	805.13	194.18	1.22
1	164	5 min	11335.00	5090.00	5096.13	5096.12	5097.32	0.058894	8.74	1296.44	526.59	0.98
1	163	5 min	11335.00	5030.00	5035.13	5035.13	5036.40	0.058536	9.07	1249.65	2751.23	0.99
1	162	5 min	11335.00	4975.00	4977.98	4977.98	4978.74	0.073342	6.99	1620.83	1089.24	1.01

HEC-RAS Plan: Plan 02 River: Pine Creek Reach: 1 Profile: 10 min

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	200	10 min	8501.00	7920.00	7930.39	7930.39	7933.01	0.049096	12.99	654.29	125.96	1.00
1	199	10 min	8501.00	7840.00	7849.28	7850.19	7853.00	0.080335	15.49	548.75	118.29	1.27
1	198	10 min	8501.00	7720.00	7729.30	7731.00	7734.75	0.118162	18.73	453.91	97.63	1.53
1	197	10 min	8501.00	7560.00	7567.85	7569.80	7573.89	0.162340	19.72	431.10	109.87	1.75
1	196	10 min	8501.00	7420.00	7425.59	7426.71	7429.07	0.145166	14.96	568.40	203.28	1.58
1	195	10 min	8501.00	7320.00	7327.48	7328.52	7331.07	0.101935	15.19	559.58	149.53	1.38
1	194	10 min	8501.00	7240.00	7250.19	7251.14	7254.20	0.077193	16.09	528.40	103.76	1.26
1	193	10 min	8501.00	7160.00	7168.38	7169.25	7171.83	0.084733	14.91	570.16	136.13	1.28
1	192	10 min	8501.00	7120.00	7130.41	7130.41	7133.06	0.049463	13.08	649.74	124.88	1.01
1	191	10 min	8501.00	7040.00	7051.24	7048.90	7052.12	0.014656	7.53	1128.31	200.84	0.56
1	190	10 min	8501.00	7020.00	7031.24	7031.24	7034.08	0.047898	13.52	628.64	111.82	1.01
1	189	10 min	8501.00	6960.00	6970.87	6971.24	6974.12	0.057272	14.46	587.88	108.13	1.09
1	188	10 min	8501.00	6900.00	6910.78	6911.24	6914.14	0.059863	14.70	578.21	107.24	1.12
1	187	10 min	8501.00	6850.00	6861.09	6861.24	6864.09	0.051682	13.91	610.97	110.23	1.04
1	186	10 min	8501.00	6800.00	6811.10	6811.24	6814.09	0.051440	13.89	612.05	110.33	1.04
1	185	10 min	8501.00	6720.00	6730.22	6731.24	6734.38	0.079681	16.37	519.41	101.64	1.28
1	184	10 min	8501.00	6640.00	6650.21	6651.24	6654.39	0.080068	16.40	518.47	101.55	1.28
1	183	10 min	8501.00	6560.00	6570.21	6571.24	6574.39	0.080068	16.40	518.47	101.55	1.28
1	182	10 min	8501.00	6480.00	6490.21	6491.24	6494.39	0.080068	16.40	518.47	101.55	1.28
1	181	10 min	8501.00	6400.00	6410.21	6411.24	6414.39	0.080068	16.40	518.47	101.55	1.28
1	180	10 min	8501.00	6280.00	6289.47	6291.24	6295.12	0.119872	19.06	445.66	94.15	1.55
1	179	10 min	8501.00	6160.00	6169.47	6171.24	6175.12	0.119872	19.06	445.66	94.15	1.55
1	178	10 min	8501.00	6080.00	6090.21	6091.24	6094.39	0.080232	16.41	518.07	101.51	1.28
1	177	10 min	8501.00	6000.00	6010.21	6011.24	6014.39	0.080068	16.40	518.47	101.55	1.28
1	176	10 min	8501.00	5940.00	5950.70	5951.24	5954.16	0.062488	14.94	568.98	106.38	1.14
1	175	10 min	8501.00	5840.00	5849.80	5851.24	5854.72	0.099874	17.81	477.23	97.42	1.42
1	174	10 min	8501.00	5750.00	5759.99	5761.24	5764.55	0.090035	17.13	496.15	99.34	1.35
1	173	10 min	8501.00	5700.00	5711.09	5711.24	5714.09	0.051682	13.91	610.97	110.23	1.04
1	172	10 min	8501.00	5645.00	5656.02	5656.24	5659.10	0.053289	14.07	603.99	109.60	1.06
1	171	10 min	8501.00	5550.00	5559.89	5561.24	5564.63	0.094878	17.47	486.50	98.37	1.38
1	170	10 min	8501.00	5500.00	5511.09	5511.24	5514.09	0.051682	13.91	610.97	110.23	1.04
1	169	10 min	8501.00	5438.00	5448.76	5449.24	5452.15	0.060635	14.77	575.44	106.98	1.12
1	168	10 min	8501.00	5360.00	5367.78	5368.56	5370.94	0.085244	14.26	596.01	153.14	1.27
1	167	10 min	8501.00	5295.00	5299.72	5300.04	5301.43	0.088891	10.47	811.85	343.81	1.20
1	166	10 min	8501.00	5215.00	5224.20	5224.79	5226.95	0.078612	13.31	638.68	170.80	1.21
1	165	10 min	8501.00	5140.00	5147.44	5147.96	5150.11	0.076458	13.12	648.00	174.21	1.20
1	164	10 min	8501.00	5090.00	5095.66	5095.64	5096.67	0.060540	8.05	1056.63	497.66	0.97
1	163	10 min	8501.00	5030.00	5034.57	5034.57	5035.71	0.062221	8.57	992.21	2660.98	1.00
1	162	10 min	8501.00	4975.00	4977.65	4977.65	4978.33	0.076843	6.62	1283.60	969.33	1.01

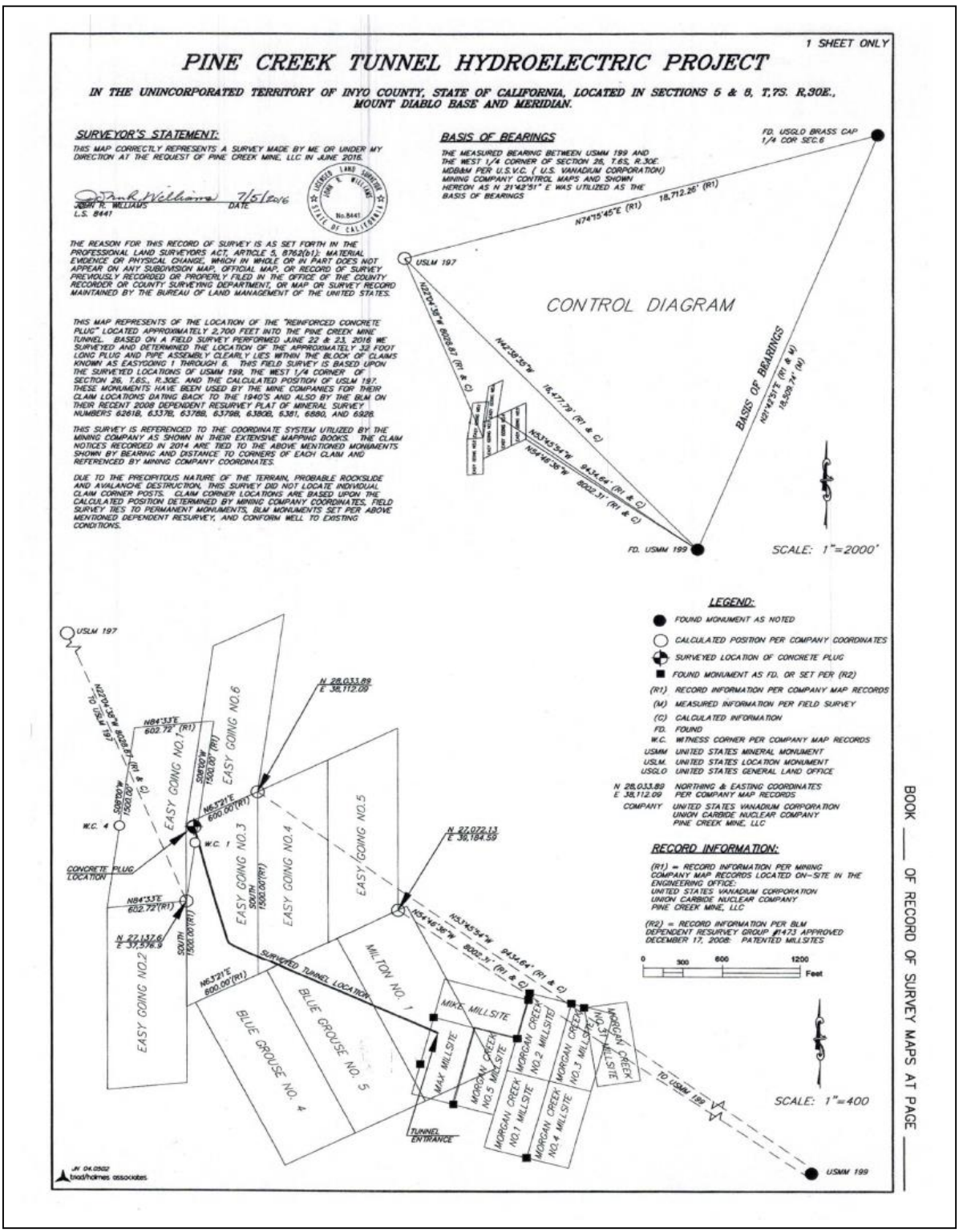
HEC-RAS Plan: Plan 02 River: Pine Creek Reach: 1 Profile: 20 min

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	200	20 min	2672.00	7920.00	7926.55	7926.55	7928.19	0.056782	10.27	260.08	79.42	1.00
1	199	20 min	2672.00	7840.00	7846.10	7846.42	7848.07	0.074346	11.27	237.15	77.76	1.14
1	198	20 min	2672.00	7720.00	7726.04	7726.94	7729.06	0.116295	13.94	191.69	63.45	1.41
1	197	20 min	2672.00	7560.00	7565.10	7566.18	7568.44	0.159554	14.67	182.15	71.42	1.62
1	196	20 min	2672.00	7420.00	7423.62	7424.22	7425.58	0.145948	11.22	238.12	131.57	1.47
1	195	20 min	2672.00	7320.00	7324.79	7325.36	7326.90	0.108888	11.66	229.16	95.69	1.33
1	194	20 min	2672.00	7240.00	7246.50	7247.02	7248.89	0.083706	12.42	215.18	66.21	1.21
1	193	20 min	2672.00	7160.00	7166.25	7165.83	7167.35	0.039839	8.41	317.63	101.60	0.84
1	192	20 min	2672.00	7120.00	7126.57	7126.57	7128.22	0.056591	10.30	259.32	78.89	1.00
1	191	20 min	2672.00	7040.00	7047.13	7045.61	7047.67	0.016412	5.89	453.97	127.39	0.55
1	190	20 min	2672.00	7020.00	7027.09	7027.09	7028.87	0.055510	10.70	249.69	70.47	1.00
1	189	20 min	2672.00	6960.00	6967.09	6967.09	6968.87	0.055510	10.70	249.69	70.47	1.00
1	188	20 min	2672.00	6900.00	6907.23	6907.09	6908.87	0.049951	10.29	259.77	71.88	0.95
1	187	20 min	2672.00	6850.00	6857.21	6857.09	6858.87	0.050714	10.34	258.30	71.67	0.96
1	186	20 min	2672.00	6800.00	6807.09	6807.09	6808.87	0.055510	10.70	249.69	70.47	1.00
1	185	20 min	2672.00	6720.00	6726.71	6727.09	6728.92	0.074559	11.95	223.54	66.68	1.15
1	184	20 min	2672.00	6640.00	6646.63	6647.09	6648.95	0.079493	12.24	218.23	65.88	1.19
1	183	20 min	2672.00	6560.00	6566.62	6567.09	6568.96	0.079900	12.27	217.82	65.82	1.19
1	182	20 min	2672.00	6480.00	6486.62	6487.09	6488.96	0.080121	12.28	217.59	65.78	1.19
1	181	20 min	2672.00	6400.00	6406.62	6407.09	6408.96	0.079900	12.27	217.82	65.82	1.19
1	180	20 min	2672.00	6280.00	6286.15	6287.09	6289.28	0.118019	14.20	188.18	61.16	1.43
1	179	20 min	2672.00	6160.00	6166.14	6167.09	6169.30	0.119784	14.28	187.13	61.01	1.44
1	178	20 min	2672.00	6080.00	6086.54	6087.09	6088.99	0.085260	12.57	212.58	65.02	1.23
1	177	20 min	2672.00	6000.00	6006.61	6007.09	6008.96	0.080564	12.31	217.14	65.72	1.19
1	176	20 min	2672.00	5940.00	5946.91	5947.09	5948.88	0.063636	11.26	237.22	68.69	1.07
1	175	20 min	2672.00	5840.00	5846.38	5847.09	5849.08	0.096959	13.19	202.57	63.47	1.30
1	174	20 min	2672.00	5750.00	5756.47	5757.09	5759.03	0.090502	12.85	207.87	64.30	1.26
1	173	20 min	2672.00	5700.00	5707.10	5707.09	5708.87	0.055084	10.67	250.42	70.57	1.00
1	172	20 min	2672.00	5645.00	5652.09	5652.09	5653.87	0.055449	10.70	249.80	70.49	1.00
1	171	20 min	2672.00	5550.00	5556.46	5557.09	5559.03	0.090721	12.87	207.68	64.27	1.26
1	170	20 min	2672.00	5500.00	5507.09	5507.09	5508.87	0.055449	10.70	249.80	70.49	1.00
1	169	20 min	2672.00	5438.00	5445.09	5445.09	5446.87	0.055510	10.70	249.69	70.47	1.00
1	168	20 min	2672.00	5360.00	5365.16	5365.40	5366.78	0.075160	10.19	262.29	101.59	1.12
1	167	20 min	2672.00	5295.00	5298.17	5298.19	5299.00	0.073680	7.31	365.65	230.73	1.02
1	166	20 min	2672.00	5215.00	5221.28	5221.60	5223.02	0.078436	10.59	252.37	94.60	1.14
1	165	20 min	2672.00	5140.00	5144.81	5145.02	5146.32	0.077478	9.87	270.67	112.59	1.12
1	164	20 min	2672.00	5090.00	5094.26	5094.15	5094.82	0.063121	6.01	444.95	335.30	0.92
1	163	20 min	2672.00	5030.00	5032.86	5032.86	5033.59	0.074365	6.86	389.57	2359.25	1.01
1	162	20 min	2672.00	4975.00	4976.67	4976.67	4977.10	0.087869	5.21	512.41	612.44	1.00

Exhibit E

Appendix 4

Land Survey Map And Opinion Re Location Of Concrete Plug


1 SHEET ONLY
PINE CREEK TUNNEL HYDROELECTRIC PROJECT
IN THE UNINCORPORATED TERRITORY OF INYO COUNTY, STATE OF CALIFORNIA, LOCATED IN SECTIONS 5 & 8, T.7S. R.30E., MOUNT DIABLO BASE AND MERIDIAN.
SURVEYOR'S STATEMENT:
THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION AT THE REQUEST OF PINE CREEK MINE, LLC IN JUNE 2016.
JOHN R. WILLIAMS L.S. 8441
DATE
No. 8441
THE REASON FOR THIS RECORD OF SURVEY IS AS SET FORTH IN THE PROFESSIONAL LAND SURVEYORS ACT, ARTICLE 5, 8762(b1); MATERIAL EVIDENCE OR PHYSICAL CHANGE, WHICH IN WHOLE OR IN PART DOES NOT APPEAR ON ANY SUBDIVISION MAP, OFFICIAL MAP, OR RECORD OF SURVEY PREVIOUSLY RECORDED OR PROPERLY FILED IN THE OFFICE OF THE COUNTY RECORDER OR COUNTY SURVEYING DEPARTMENT, OR MAP OR SURVEY RECORD MAINTAINED BY THE BUREAU OF LAND MANAGEMENT OF THE UNITED STATES.
THIS MAP REPRESENTS OF THE LOCATION OF THE "REINFORCED CONCRETE PLUG" LOCATED APPROXIMATELY 2,700 FEET INTO THE PINE CREEK MINE TUNNEL. BASED ON A FIELD SURVEY PERFORMED JUNE 22 & 23, 2016 WE SURVEYED AND DETERMINED THE LOCATION OF THE APPROXIMATELY 32 FOOT LONG PLUG AND PIPE ASSEMBLY, CLEARLY LIES WITHIN THE BLOCK OF CLAIMS KNOWN AS EASYGOING 1 THROUGH 6. THIS FIELD SURVEY IS BASED UPON THE SURVEYED LOCATIONS OF USMM 198, THE WEST 1/4 CORNER OF SECTION 28, T.6S., R.30E. AND THE CALCULATED POSITION OF USLM 197. THESE MONUMENTS HAVE BEEN USED BY THE MINE COMPANIES FOR THEIR CLAIM LOCATIONS DATING BACK TO THE 1940'S AND ALSO BY THE BLM ON THEIR RECENT 2008 DEPENDENT RESURVEY PLAT OF MINERAL SURVEY NUMBERS 6261B, 6337B, 6378B, 6379B, 6380B, 6381, 6880, AND 6926.
THIS SURVEY IS REFERENCED TO THE COORDINATE SYSTEM UTILIZED BY THE MINING COMPANY AS SHOWN IN THEIR EXTENSIVE MAPPING BOOKS. THE CLAIM NOTICES RECORDED IN 2014 ARE TIED TO THE ABOVE MENTIONED MONUMENTS SHOWN BY BEARING AND DISTANCE TO CORNERS OF EACH CLAIM AND REFERENCED BY MINING COMPANY COORDINATES.
DUE TO THE PRECIPITOUS NATURE OF THE TERRAIN, PROBABLE ROCKSLIDE AND AVALANCHE DESTRUCTION, THIS SURVEY DID NOT LOCATE INDIVIDUAL CLAIM CORNER POSTS. CLAIM CORNER LOCATIONS ARE BASED UPON THE CALCULATED POSITION DETERMINED BY MINING COMPANY COORDINATES, FIELD SURVEY TIES TO PERMANENT MONUMENTS, BLM MONUMENTS SET PER ABOVE MENTIONED DEPENDENT RESURVEY, AND CONFORM WELL TO EXISTING CONDITIONS.
BASIS OF BEARINGS
THE MEASURED BEARING BETWEEN USMM 199 AND THE WEST 1/4 CORNER OF SECTION 28, T.6S, R.30E. MDB&M PER U.S.V.C. (U.S. VANADIUM CORPORATION) MINING COMPANY CONTROL MAPS AND SHOWN HEREON AS N 21°42'51" E WAS UTILIZED AS THE BASIS OF BEARINGS
FD. USGLO BRASS CAP 1/4 COR SEC.6
N74°15'45"E (R1)
18,712.26' (R1)
USLM 197
N22°04'39"W 8028.87' (R1 & C)
N42°58'35"W
16,477.79' (R1 & C)
N53°45'54"W
N54°46'38"W
9434.64' (R1 & C)
8002.31' (R1 & C)
BASIS OF BEARINGS
N21°42'51"E (R1 & M)
18,509.74' (M)
FD. USMM 199
CONTROL DIAGRAM
SCALE: 1"=2000'
LEGEND:
FOUND MONUMENT AS NOTED
CALCULATED POSITION PER COMPANY COORDINATES
SURVEYED LOCATION OF CONCRETE PLUG
FOUND MONUMENT AS FD. OR SET PER (R2)
(R1) RECORD INFORMATION PER COMPANY MAP RECORDS
(M) MEASURED INFORMATION PER FIELD SURVEY
(C) CALCULATED INFORMATION
FD. FOUND
W.C. WITNESS CORNER PER COMPANY MAP RECORDS
USMM UNITED STATES MINERAL MONUMENT
USLM UNITED STATES LOCATION MONUMENT
USGLO UNITED STATES GENERAL LAND OFFICE
N 28,033.89 E 38,112.09 NORTHING & EASTING COORDINATES PER COMPANY MAP RECORDS
COMPANY UNITED STATES VANADIUM CORPORATION UNION CARBIDE NUCLEAR COMPANY PINE CREEK MINE, LLC
RECORD INFORMATION:
(R1) = RECORD INFORMATION PER MINING COMPANY MAP RECORDS LOCATED ON-SITE IN THE ENGINEERING OFFICE: UNITED STATES VANADIUM CORPORATION UNION CARBIDE NUCLEAR COMPANY PINE CREEK MINE, LLC
(R2) = RECORD INFORMATION PER BLM DEPENDENT RESURVEY GROUP #1473 APPROVED DECEMBER 17, 2008: PATENTED MILLSITES
0 300 600 1200 Feet
USLM 197
N 28,033.89 E 38,112.09
N 27,072.13 E 38,184.59
N 27,137.6 E 37,576.9
W.C. 4
W.C. 1
CONCRETE PLUG LOCATION
EASY GOING NO.1
EASY GOING NO.2
EASY GOING NO.3
EASY GOING NO.4
EASY GOING NO.5
EASY GOING NO.6
MILTON NO. 1
BLUE GROUSE NO. 4
BLUE GROUSE NO. 5
SURVEYED TUNNEL LOCATION
MIKE MILLSITE
MAX MILLSITE
MORGAN CREEK NO.1 MILLSITE
MORGAN CREEK NO.2 MILLSITE
MORGAN CREEK NO.3 MILLSITE
MORGAN CREEK NO.4 MILLSITE
MORGAN CREEK NO.5 MILLSITE
TUNNEL ENTRANCE
TO USMM 199
USMM 199
SCALE: 1"=400
JN 04.0502
BOOK ____ OF RECORD OF SURVEY MAPS AT PAGE ____

triad/holmes associates
civil engineering
land surveying
mammoth lakes • bishop • redwood city
napa • san luis obispo

June 24, 2016

Project No 12532-006-California
Pine Creek Tunnel Hydroelectric Project
Pine Creek Mine, LLC

Mr. Craig N. Rossell
Pine Creek Mine, LLC
228 West Bonita Ave
Claremont, CA 91711
via email: Craig@Rosselllaw.com

Dear Mr. Rossell:

This letter is in regards to the location of the "reinforced concrete plug" located approximately 2,700 feet into the Pine Creek Mine Tunnel. Based on a field survey performed June 22 & 23, 2016 we have determined that the location of the approximately 32 foot long concrete plug and pipe assembly clearly lies within the block of Claims known as EASYGOING 1 through 6. Our field survey is based upon the surveyed locations of USMM 199 (US Mineral Monument), the West 1/4 corner of Section 26 T.6S., R.30E. and the calculated positon of USLM 197 (US Location Monument). These monuments have been utilized by the mine companies for their claim locations dating back to the 1940's and also by the BLM on their recent 2008 survey plat.

Our survey is referenced to the coordinate system utilized by the mining company as shown in their extensive mapping books (photos of map pages attached to this document). The claim notices recorded in 2014 (attached) are tied to the above mentioned monuments shown by bearing and distance to corners of each claim and referenced by mining company coordinates. Due to the precipitous nature of the terrain this field survey did not locate individual claim corner posts. Claim corner locations are based upon the calculated position determined by mining company coordinates, field survey ties to permanent monuments, and conform well to existing conditions.

The "reinforced concrete plug" lies within an overlapping portion of EASYGOING NO. 1 and EASYGOING NO. 3. The surveyed location of the concrete plug is in general agreement with the location as shown on EXHIBIT G-1 FERC Project No p-12532-004 prepared by Andrew K. Holmes dated 6/9/2016.

Sincerely,

John R. Williams

John Williams
Professional Land Surveyor, CA# 8441
Triad/Holmes Associates

CAMC0309284

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001658-00
Check Number 036434
Monday, JUL 07, 2014 15:53:28
MIC $1.00:S21 $2.00:REC $13.00
SYS $3.00:SST $1.00:
Ttl Pd $20.00 Rcpt # 0000104059
DMO/R1/1-3

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Easy going #1.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2x2x4 wood post in Rockpile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☒ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#197 USMM 8028.87 Feet from (SE COR #1) gw
~~NE corner~~
(N. 22° ~~04~~ 41'
(W. 38" ?
(N. 27137.6
(E. 3757.69 3757

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NE

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JUL 10 2014
USDI-BLM-BAKO

CAMC0309285

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001652-00
Check Number 036434
Monday, JUL 07, 2014 15:53:23
MIC $1.00|S21 $2.00|REC $13.00
SYS $3.00|SST $1.00|
Tel Pd $20.00 Rcpt # 0000104053
DMO/R1/1-3

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC
ADDRESS 679 Marina Dr.
Boulder City NV 89005

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is EASY GOING #3.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood Post in Rock Pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☐ SW ¼ ☑ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

#1199 USMM 9434.64 Feet from NE CORNER 1
(N. 27,764.77 } = NW COR (N. 28,033.89
(E. 37,575.84 } EASYGOING 3 (E. 38,112.00

6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

1500 Feet by 600 Feet

7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

N/S

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CAMC0309287

RECORDING REQUESTED BY AND MAIL TO:
(Please type or use blue ink on this form)

NAME Bishop Tungsten LLC

ADDRESS 679 Marina Dr.
Boulder City NV 89005

INYO, County Recorder
KAMMI FOOTE Co Recorder Office
DOC- 2014-0001656-00
Check Number 036434
Monday, JUL 07, 2014 15:53:26
MIC $1.00 SZ1 $2.00 REC $13.00
SYS $3.00 SST $1.00
Ttl Pd $20.00 Rcpt # 0000104057
DMO/R1/1-3

RECORDER'S USE ONLY

LODE MINING CLAIM LOCATION NOTICE (CALIFORNIA)

To Whom It May Concern, please take notice that:

1. Lode mining claim name is Easy Going #6.

2. Date of location (date a conspicuous and substantial location monument was erected and location notice posted in or on it) of this lode mining claim is 7 (month) 3 (day) 2014 (year).

3. Description of the discovery monument is as follows: 2X2X4 wood Post in Rock Pile with Aluminum tag.

4. Lode mining claim is located in the following quarter-sections(s), section(s), township(s), range(s), and meridian:

NE ¼ ☐ NW ¼ ☑ SW ¼ ☑ SE ¼ ☐ Sec. 5 T. 7S R. 30E Mer. 21

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

NE ¼ ☐ NW ¼ ☐ SW ¼ ☐ SE ¼ ☐ Sec. _____ T. _____ R. _____ Mer. _____

5. The discovery site as described by reference to some natural object or permanent monument so that the site can be readily found on the ground is as follows:

(SE cor #1)
#199 USMM 9434.64 Feet from NE CORNER 1
(S. 53°
(E 45.9°
(N 28,033.89
(E 38,112.09

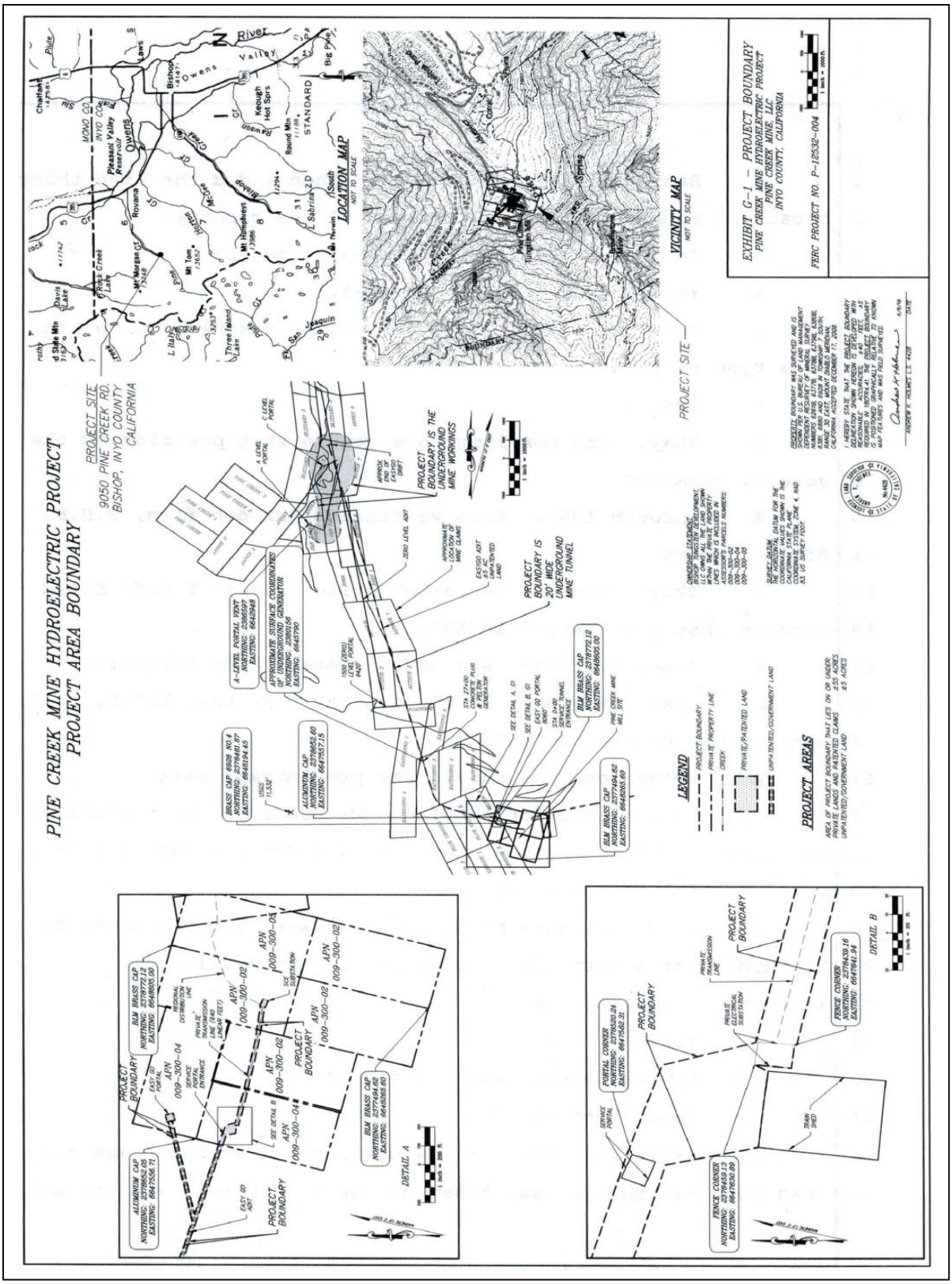
6. The number of linear feet claimed in length (not to exceed 1,500 feet) along the course of the vein (or lode, ledge, tabular deposit or zone), and the number of feet in length each way from the point of discovery; with the width of the claim (not to exceed 300 feet) on each side of the center of the claim is:

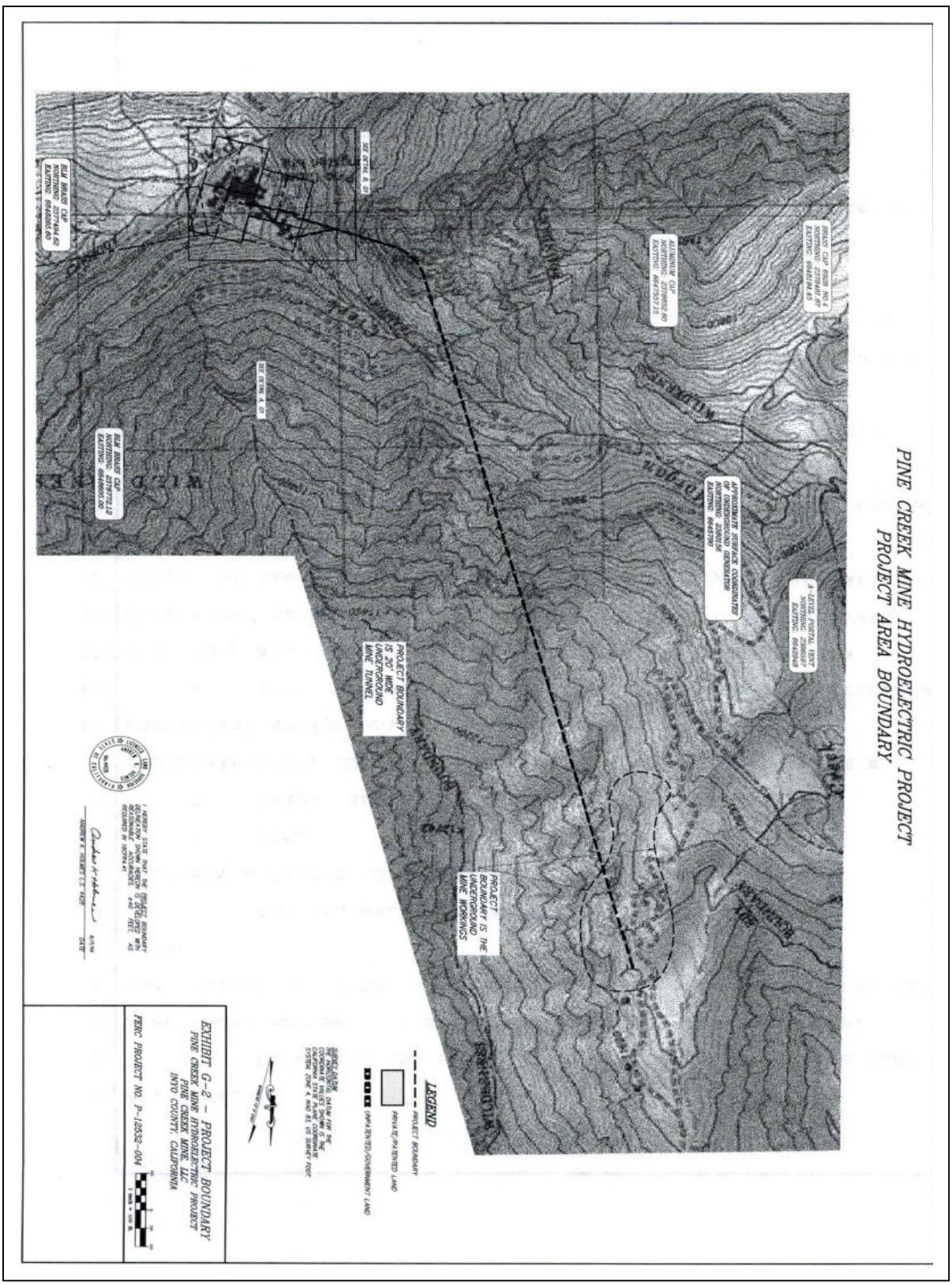
1500 Feet by 600 Feet

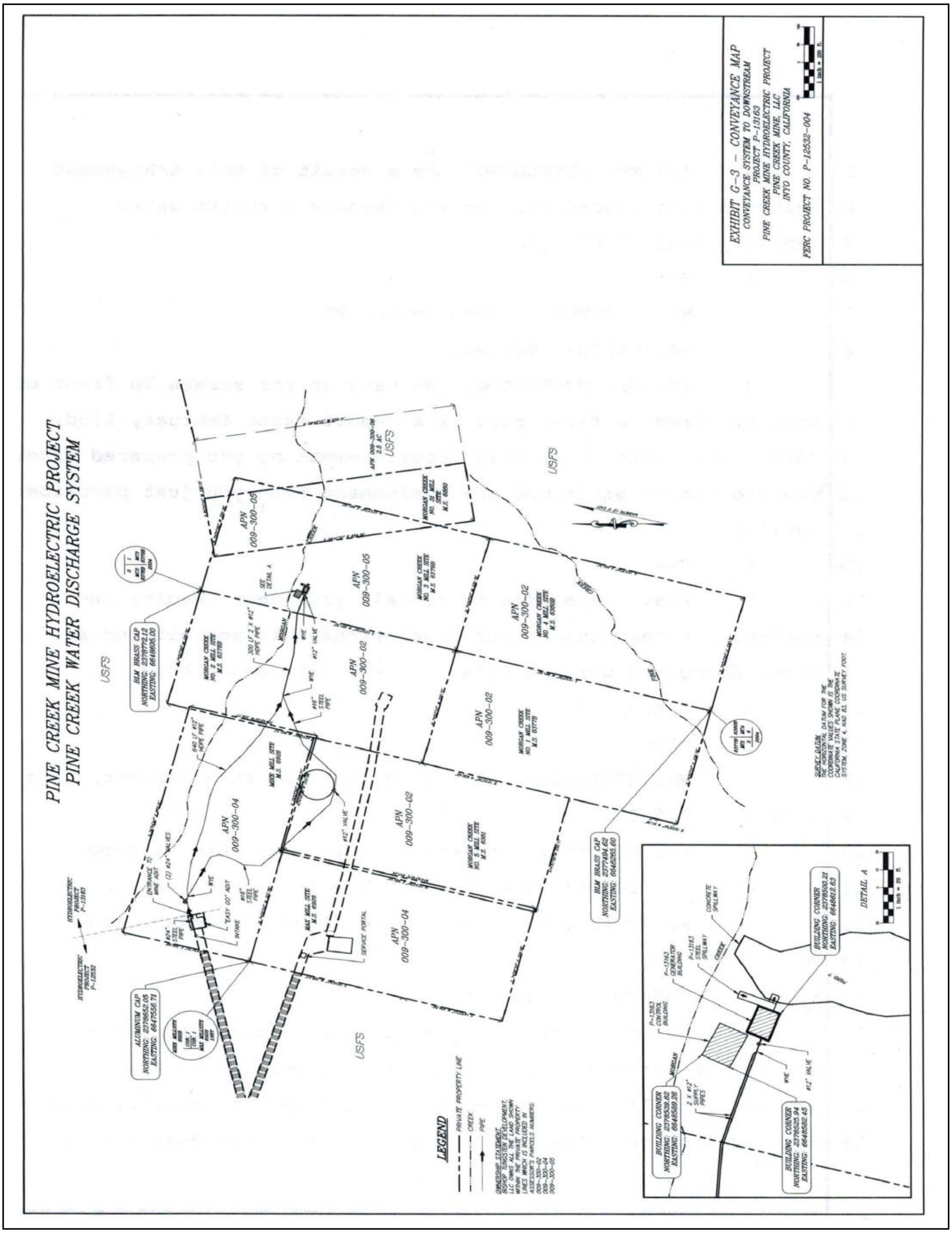
7. The general course of the vein (lode, ledge, tabular deposit or zone) is by compass direction:

NE

RECEIVED
JUL 10 2014
USDA BLM BISHOP


PINE CREEK MINE HYDROELECTRIC PROJECT
PROJECT AREA BOUNDARY
PROJECT SITE
9050 PINE CREEK RD.
BISHOP, INYO COUNTY
CALIFORNIA
LOCATION MAP
NOT TO SCALE
VICINITY MAP
NOT TO SCALE
PROJECT SITE
EXHIBIT G-1 – PROJECT BOUNDARY
PINE CREEK MINE HYDROELECTRIC PROJECT
PINE CREEK MINE, LLC
INYO COUNTY, CALIFORNIA
FERC PROJECT NO. P-12532-004
PROJECT BOUNDARY IS THE UNDERGROUND MINE WORKINGS
PROJECT BOUNDARY IS 20' ABOVE UNDERGROUND MINE TUNNEL
LEGEND
PROJECT BOUNDARY
PRIVATE PROPERTY LINE
CREEK
PRIVATE/PATENTED LAND
UNPATENTED/GOVERNMENT LAND
PROJECT AREAS
DETAIL A
DETAIL B
PROJECT BOUNDARY
PRIVATE TRANSMISSION LINE
PRIVATE ELECTRICAL SUBSTATION
TRAIN SHED
SERVICE PORTAL


PINE CREEK MINE HYDROELECTRIC PROJECT
PROJECT AREA BOUNDARY
PROJECT BOUNDARY IS 20' WIDE UNDERGROUND MINE TUNNEL
PROJECT BOUNDARY IS THE UNDERGROUND MINE WORKINGS
LEGEND
PROJECT BOUNDARY
PRIVATE/PATENTED LAND
UNPATENTED/GOVERNMENT LAND
EXHIBIT G-2 - PROJECT BOUNDARY
PINE CREEK MINE HYDROELECTRIC PROJECT
PINE CREEK MINE, LLC
INYO COUNTY, CALIFORNIA
FERC PROJECT NO. P-12532-004


PINE CREEK MINE HYDROELECTRIC PROJECT
PINE CREEK WATER DISCHARGE SYSTEM
EXHIBIT G-3 – CONVEYANCE MAP
CONVEYANCE SYSTEM TO DOWNSTREAM PROJECT P-13163
PINE CREEK MINE HYDROELECTRIC PROJECT
PINE CREEK MINE, LLC
INYO COUNTY, CALIFORNIA
FERC PROJECT NO. P-12532-004
APN 009-300-05
APN 009-300-02
APN 009-300-04
USFS
BLM BRASS CAP
ALUMINUM CAP
DETAIL A
LEGEND
PRIVATE PROPERTY LINE
CREEK
PIPE

- END OF EXHIBIT E APPENDICES -