Appendix G

Cultural Resources Inventory and Evaluation Report

Cultural Resources Inventory and Evaluation Report for Pine Creek Mine Hydroelectric Project (FERC Project No. 12532) Inyo County, California

Forest Service Heritage Report No. R2013050401778

Prepared For:

Applicant: Pine Creek Mine, LLC
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July 2015

Summary of Findings

Pine Creek Mine, LLC is proposing a hydroelectric project within the inner mine workings of Pine Creek Tungsten Mine located on patented and unpatented mining claims adjacent to the Inyo National Forest (Figure 1). The company was issued a preliminary permit by the Federal Energy Regulatory Commission (FERC) in December 2010 pending issuance of a hydroelectric license, which constitutes a federal undertaking. JRP Historical Consulting, LLC (JRP) and Davis-King & Associates (DKA) have prepared this Cultural Resources Inventory and Evaluation Report (CRIER) to evaluate the potential of the project to affect archeological and/or historic resources. JRP evaluated historic buildings, structures, or other built environment resources eligible for listing in the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), or that would be determined an historical resource for the purposes of the California Environmental Quality Act (CEQA). DKA conducted archaeological investigations, and met with Native American tribal representatives to address any concerns. The purpose of this report is to comply with Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. 300101 et seq.), which requires federal agencies to take into account the potential effects of their activities and programs on historic properties. This includes identification of properties that are listed in or are determined eligible for listing in the NRHP, assessment of the potential for adverse effects to these properties, and development of mitigation measures that would serve to avoid and/or limit potential adverse effects. Guidelines for implementing Section 106 requirements are promulgated by the Advisory Council on Historic Preservation (ACHP) in "Protection of Historic Properties" (36 CFR 800). The property evaluated as part of this project has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines using the criteria outlined in Section 5024.1 of the California Public Resources Code.

This CRIER for the Pine Creek Hydroelectric Project is based on research and fieldwork conducted in August 2014. The Architectural Area of Potential Effect (APE) encompasses the surface boundaries of Pine Creek Tungsten Mine and its built environment resources (i.e., buildings, structures, or objects) between the original mine portal at an elevation of 11,300 feet to the Easy-Go Adit and mill site at 7,600 feet msl, and extends east to the mine's tailing piles. The Archeological APE encompasses primarily the Easy-Go Adit Utility Service Portal and mill site at 7,500 feet, and was established in consultation with FERC's archaeologist, and Native American Tribes. The APE map is attached as Appendix A, Figure A1, Map 1 and Map 2. While the same NRHP criteria are applied to mines as other cultural resources, mining resources that may or may not have above-ground remains differ in the way they are evaluated against the criteria. It should be noted that mining sites are typically evaluated as single complexes.

Pine Creek Mine had the potential to be considered significant under NRHP Criteria A and B, and CRHR Criteria 1 and 2, however, the complex now lacks sufficient integrity to portray its significance under these criteria. Additionally, Building No. 12, the Metals Lab, is the only remaining building importantly associated with the mine's significance. This building is individually eligible for listing in the NRHP under Criteria A and B and the CRHR under Criteria 1 and 2, and retains sufficient integrity to its period of significance. Therefore, the Metals Lab, Building No. 12, would be considered an historical resource for

the purposes of CEQA. A Department of Parks and Recreation (DPR) 523 form for Pine Creek Tungsten Mine with detailed descriptions and evaluation can be found in Appendix B.

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Attachments

1 Introduction and Description (By S. Davis-King)

1.1 Project Location and Introduction

The proposed Pine Creek Mine Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project 12532; Project) is situated along the Pine and Morgan creek canyons in northwestern Inyo County, northwest of Bishop, California (Figure 1). Three sides of the project abut the John Muir Wilderness within the United States (US) Forest Service/Inyo National Forest (Forest). The project area is depicted on the 1994 *Mount Tom* 7.5 minute United States Geological Survey (USGS) topographic quadrangle in portions of Sections 5 and 8 of Township 7 South, Range 30 East, Mount Diablo Base and Meridian (Figure 4).

The proposed Project is located in the Easy Go Adit, a feature of the Pine Creek Mine, described below. The Project would use surface lands owned by Bishop Tungsten Development, LLC and underground lands with property rights (mining claims) in Bishop Tungsten Development, LLC subject to specific limitations authorized by Congress or adopted by the courts. The Project would install a hydroelectric turbine within the adit, about 2500 linear feet underground from the Easy Go Service Utility Portal. The adit, portals, electrical wiring, and access routes are existing features of the mining operation.

Groundwater discharge from within the mine currently flows within the adit and out of the mine through the adit portal and then into Morgan Creek. As proposed, the adit, 2500 feet inside the mine, would be plugged to store the water and would discharge into the turbine for the generation of electricity. Electricity would be generated when the hydraulic head is allowed to pass through the new turbine to be installed at the plug. Aquifer and groundwater sources draining through the mine tunnel system generate a total sustainable discharge averaging approximately 10 cubic feet per second (cfs).

1.2 Regulatory Context

The FERC, in December 2010, issued the preliminary permit for this project, pending issuance of a hydroelectric license. The issuing of a federal license constitutes a federal undertaking, subject to federal historic preservation laws, including Section 106 of the National Historic Preservation Act (NHPA), as amended.

Land ownership issues related to the Project are still being discussed, but may involve the Forest, with permitting and review authority. The Forest previously authorized various Special Use Permits and Operation Plans for the Pine Creek Mine where activities were located on Forest land. Based on Project descriptions to date, all activities will occur on patented and unpatented mining claims, and will use existing mine and/or County-owned haul and access roads between the Project and the City of Bishop.

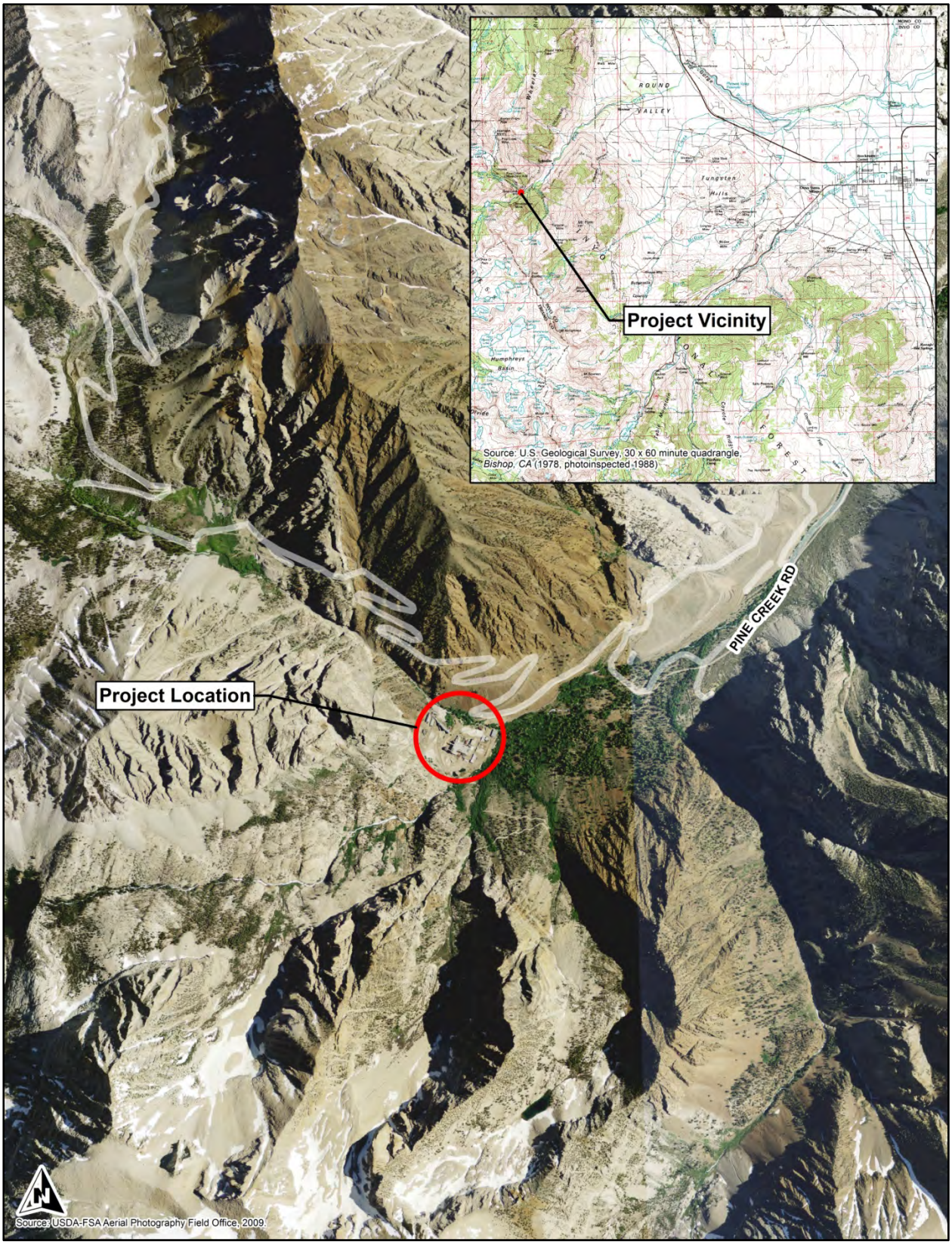

Figure 1. Project Location and Project Vicinity Map

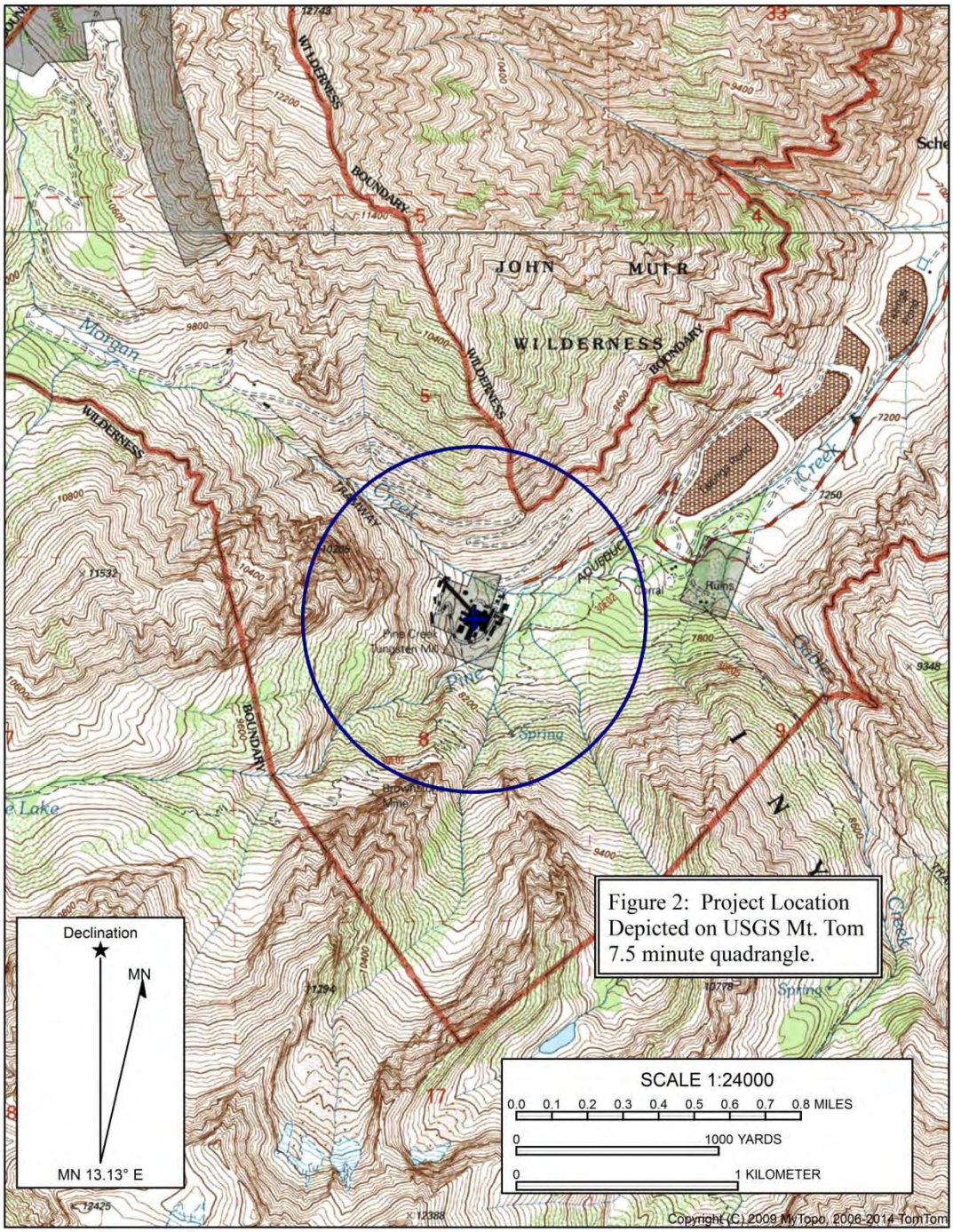

Figure 2: Project Location Depicted on USGS Mt. Tom 7.5 minute quadrangle.

Figure 2. Project Location Map.

1.3 Project Description

The Pine Creek Mine has operated for more than nine decades (see discussion below), but mine facilities are presently inactive. Water is currently flowing out of the inactive Easy Go Adit, which had been plugged (the plug was a steel plate over the man-hole with closed valves on the manifold to restrict the

flow of water behind the plug). Existing discharge piping facilities would be used to control flow and head potential to create hydroelectric power. It is estimated that by plugging the Easy Go Adit, there would be a water storage capacity of up to 1,320 feet of gross head above the plug elevation. The plug area is located at an elevation of approximately 8,080 feet above mean sea level (amsl), and is about 12 feet wide by 12 feet high by 30 feet thick, located 2,500 feet inside from the adit portal. Figure 5 shows the existing plug and plumbing fixtures that will be necessary for hydroelectric power generation.

All generating facilities would be located entirely underground in the existing mine adit. The proposed reservoir (that is, the water behind the plug) would store up to 200 acre-feet of water within the mine and have a maximum underground water surface elevation of 9400 feet above sea level.

The proposed Project would use the existing mine operation substation connections to the local utility. The existing substation facility at the site is sized for several times the expected output of the proposed development. The connecting substation is connected to a Southern California Edison (SCE)-owned substation and transmission line operating at 12.0kV. An existing 500 MCM mine power line runs from the portal to the tunnel plug. This power line will be connected to the generator at the plant end and the other end connected to the owner-owned substation off the main sub located 60 feet from the portal, at a voltage of 2.4 kV.

No new buildings or other facilities are proposed. No modifications to existing buildings are proposed. Manufacturing of all new generating facilities and pre-assembly would occur off site and would be trucked to the project location. A portable crane would lift and position the wheeled generating equipment onto the existing railroad track for delivery to the plug location by an onsite locomotive for final assembly.

Haul routes for all new equipment would occur on existing County roads and mine access roads on private land designed for heavy equipment. No grading, widening or other improvement of any road is necessary or proposed. During construction there will be two staging areas, each approximately forty feet square, at the entrance to the portals. There are no areas proposed for any ground disturbance as existing facilities will be used.

Project operations and maintenance will be the primary activities that occur on project lands. After installation, these activities will include operating and maintaining the project powerhouse and associated facilities, inside the adit. Maintenance activities will be conducted on include the tunnel and water conveyance feature.

1.4 **Background Research**

Background research of the project area included a records search at the Eastern Information Center (EIC) of the California Historical Resources Information Center by Gayat Adame, Information Officer (EIC-INY-ST-2404; letter included in Appendix C). Research investigated EIC files to include a review of their maps for the specific project location and a 1/4 mile radius around the project. Adame reviewed the Historic Property Data File (California Office of Historic Preservation [OHP] 1990); OHP Historic

Properties Data File computer list, no date provided; the Archaeological Determinations of Eligibility list (again no date provided); and the National Register of Historic Places (NRHP; OHP 1990 and updates), No cultural or historic properties were listed in any of these documents in the Project area.

The record search indicated that four cultural resources studies have been previously conducted within the project search radius. One of the surveys, by Werner (1986), apparently covered the entire mine area including the road that lead to the upper levels of the mine in Morgan Creek canyon, and was negative for cultural resources in his opinion. Three other surveys, all also apparently negative, were conducted for a Pine Creek Trail maintenance project (Hornick 2002), for a borrow pit (Miller 1986), and for a small water project at the Pine Creek Mine Pack Station (Hilton 2008). Additionally, for Pine Creek Development LLC, Manske and Larson (2009) recorded the former Tungsten Mill, prior to its demolishion by an avalanche. This record is included in Appendix B.

Historic maps provided by the EIC record search were reviewed. The United States Geological Survey (USGS) *Mt. Goddard* 30 minute map, published in 1945, fails to note any development of the mining operations in the project area at all, but the road along Pine Creek to its confluence with Gable Creek is depicted (Figure 3). As discussed below, it is known that there is development of the mine by the time the USGS (1945) was published. Four years later, the USGS (1949) *Mt. Tom* quadrangle indicated numerous mine buildings, the tramway, the road up Morgan Creek canyon and significant development of mining operations (Figure 4).

In addition to the EIC search, the California Register of Historical Resources (CRHR), the California Inventory of Historical Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992) listings were reviewed, with negative results for the project area.

Review of Forest heritage files would normally have been conducted, but due to “government shutdown” in October 2013, review of files was not possible prior to field investigations. The Forest database was subsequently checked by Forest Heritage Program Manager Jacqueline Beidl and had no information beyond that discussed in this record search summary.

Figure 3. USGS (1945) *Mt. Goddard* 30' map of the project area

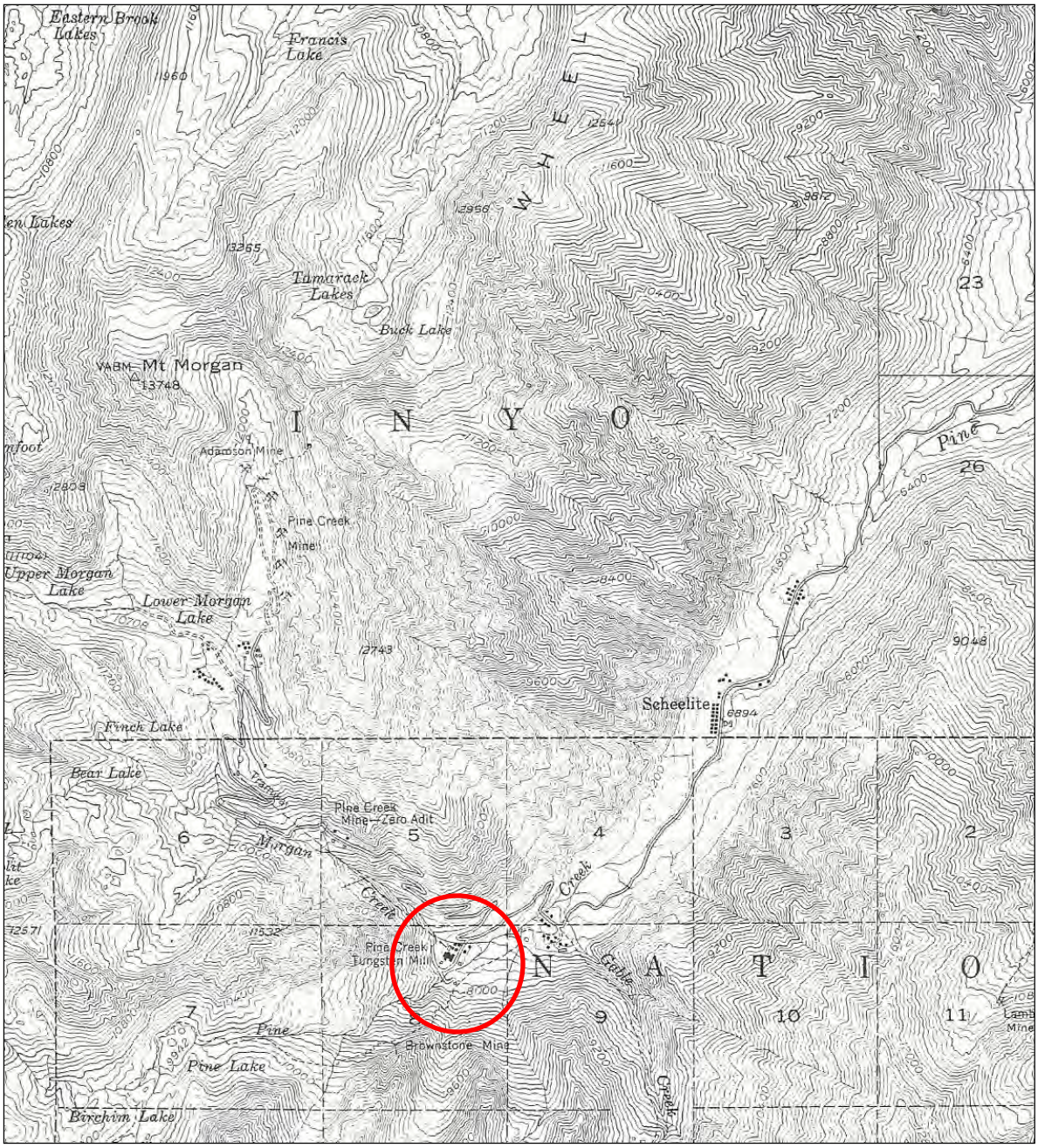

Figure 4. USGS 1949 15’ map of project area.

2 Prehistoric and Native American Background (By S. Davis-King)

2.1 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 *Kutzadika*[a] (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.

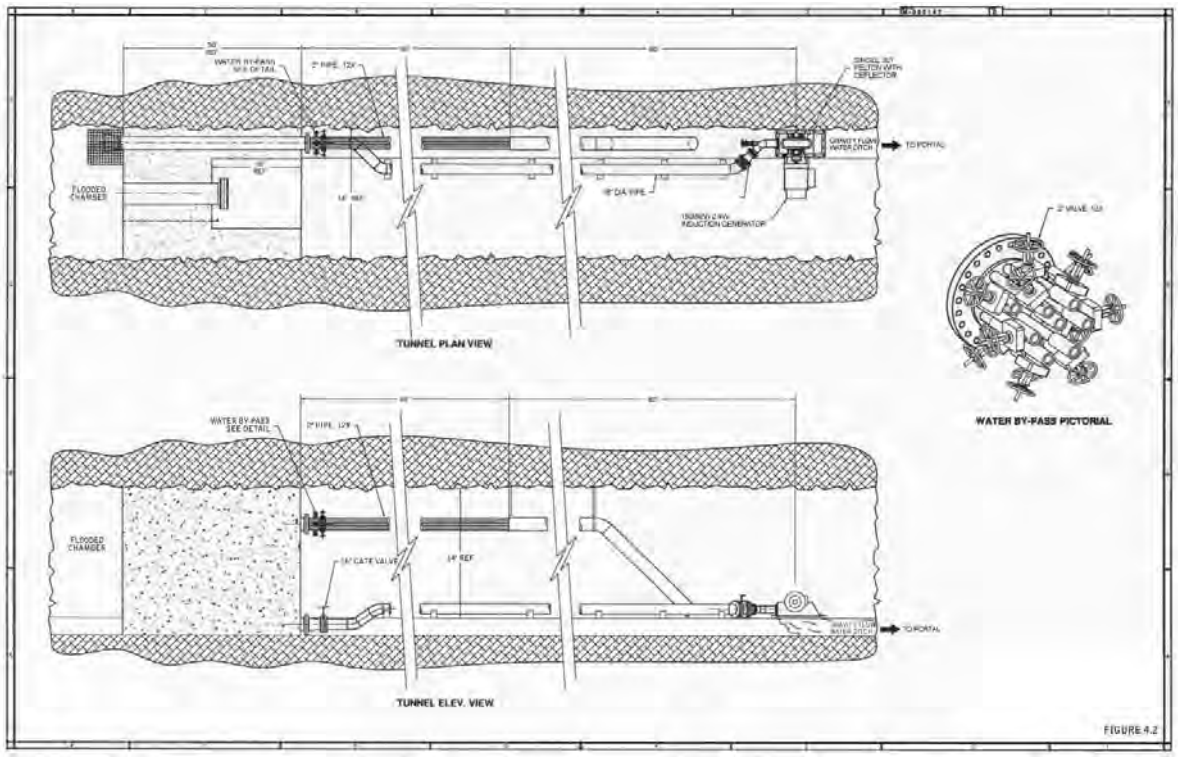

Figure 5. Plan view of Adit Plug.

Creation Stories: Of importance to the present study is the survival of two creation stories, both of which center on the Pine Creek area. The first, told by Round Valley Paiute Jennie Newland (Essene

1936) said the story took place in *Que-na-ba*, or Round Valley, at the "mouth of Pine Creek." There, she says,

> at the mouth of Pine Creek, for generations past, we have been told that it is our birthplace. This place is circular, like that of an Indian camp of today. On the east side stand two pillars. They say that these are our father and mother. After they grieved a long time, a greater spirit than they took pity on them and turned them into stone.... the tears streaming down their faces are also visible... Any one wishing to see this place, can find it at Pine Creek in Round Valley.

The full text of this story is included in Appendix E.

The second story, told by Jim Tom Jones (Hulse 1935.; punctuation and capitalization in the original) described how a young woman was walking up Pine Creek Canyon near the waterfalls, on her way to the western Sierra (Figure 6). A man followed this woman until they came to a lake: "This is the pine creek Lake on the south fork of Pine Creek Canyon" (Hulse 1935.:4). They stayed the night, and the next day returned as "man and wife" to

> the mouth of the Canyon, where they made camp. This camp was the camp where Mother and father of all Indian races lived. Here the Mother of all Indians had a lot of children. Father made bows and arrows and gave each one his bow and arrows and said to them. 'Now go where you like, have language to suit yourself. Some went East, some south, some West, and some North. [Hulse 1935.:6]... Their Mother watched her children until they were out of sight. She... started to cry. She said, 'I am going to turn into a rock and this she did. Today you can see this rock there yet [Hulse 1935.:7]

Both of these stories incorporate Pine Creek canyon into the significant places associated with the creation of the Paiute people. During the Native American consultation for this Project (see below), inquiries were made as to whether the people knew of this story and where the pillars might be located. Further, they were questioned as to whether they thought the Project might have any effect on the pillars of stone or the significance of any associated place, and those who responded said they did not believe the Project would affect anything related to the creation story. People were also asked if they knew which rock/rocks might be referenced, and if they knew where the places were. While there was some discussion about this, no one interviewed was able to identify such a place. It appears then, that the rock pillars, if they exist still, would not be affected by the Project, and thus are likely to be outside of the future proposed APE. The actual location of these ancestral features was not identified in the archives or by the Paiute informants.

Figure 6. View towards waterfalls mentioned in creation story, from Pine Creek Mine, facing west southwest (Photograph by S. Davis-King, June 2011).

2.2 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; pages 50-52; see also 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).

2.3 Archaeology

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).

3 Archaeological Survey and Results (By S. Davis-King)

Based on a telephone conversation with FERC staff, an archaeological survey of the Pine Creek Mine substation and the SCE substation was desired. A rather larger area of the Project was also investigated, as depicted on Figure 8, and described below. The area of the two substations and Easy Go Adit Service Utility Portal area was surveyed on 19 October 2013 in approximately three meter transects where appropriate; access was straightforward and visibility unconstrained. An even larger area was surveyed

in July 2014 to address concerns raised by the USFS that the project might affect a larger area. This area is depicted in Figure A1, Map 2.

Acting on behalf of the project proponents, and in consultation with the Big Pine Paiute Tribe, the Bishop Paiute Tribe, and the FERC Archaeologist, DKA established the proposed Archaeological APE for this project to include the areas that might be physically or indirectly affected by the installation of the project materials. This included access and staging areas, and areas that might be used for electrical transmission. The APE encompasses the Easy-Go Adit (secondary entrance; "Service Utility Portal" between the Engineering Building and the Locomotive Repair Shop), the rail alignment from the Engineering Building to the Service Utility Portal, and the area encompassed by buildings 1-6 (see Figure 22). Additionally, and the transformer and substation features area areas that have the potential to be affected by construction and installation and they are included in the Archaeological APE.

Figure 7. Overview of archaeological survey area. Red rectangle highlights Easy Go Utility Portal at B.

Geology of the area appears to be granitic rock with ore body including typical tungsten (wolfram) and scheelite. Vegetation observed in the mine area includes overstory species of fir (*Abies concolor*), pine (*Pinus jeffreyi*), water birch (*Betula occidentalis*), juniper (*Juniperus occidentalis*), aspen (*Populus tremuloides*), cottonwood (*P. fremontii*), various shrub-sized plants of willow (*Salix* sp.), elderberry (*Sambucus cerulea*), various buckwheats (*Eriogonum* sp.), big sagebrush (*Artemisia tridentata*), fern bush (*Chamaebatiaria millefolium*), nonnative grasses, and what appear to be numerous wildflower species that were not identified. Deer (*Odocoileus hemionus*) and rabbit (hare? cottontail?) scat was observed, and Sierra bighorn sheep (*Ovis canadensis*) are reported. No water resources beyond the water flowing from the adit opening were observed in or near the survey area. The mine itself sits above the confluence of Morgan and Pine creeks.

The Pine Creek Mine substation has a gravel base, fully covering the ground surface, while more than 95 percent of the SCE substation sits on a concrete foundation. Both substations are fully contained within chain-link fencing. Access to the SCE substation was not possible, but due to the concrete foundation, was not necessary. Access to the Pine Creek Mine substation was relatively easy by entering through a breach in the fence. The areas around each substation were investigated for artifacts and/or cultural deposits, but in neither case were any observed. Similarly, the Easy-Go Adit Service Utility Portal area depicted in Figure 9 was devoid of artifacts or archaeological deposits.

The Project survey areas have been part of tungsten mining operations since the 1930s and have been repeatedly altered by mining activities. Original ground surface has been bladed and bulldozed and old mill tailings have been used as road base, for platform construction, and so forth. For the most part, all archaeology has been compromised by the mechanical mining activities and perhaps by the avalanche that destroyed the mill (supra). No native terrain was observed and no archaeological deposits are evident. Other areas of the Pine Creek Mine were more informally examined when various tours and site visits occurred, and again, no artifacts or archaeological deposits were observed. All buildings observed were investigated and are discussed in a separate section below. The survey area is also plotted on Figure 8 (USGS 1994). The SCE substation survey area cannot be shown on the survey coverage map here because the dark footprint of the mill and other mine buildings overlays the survey location.

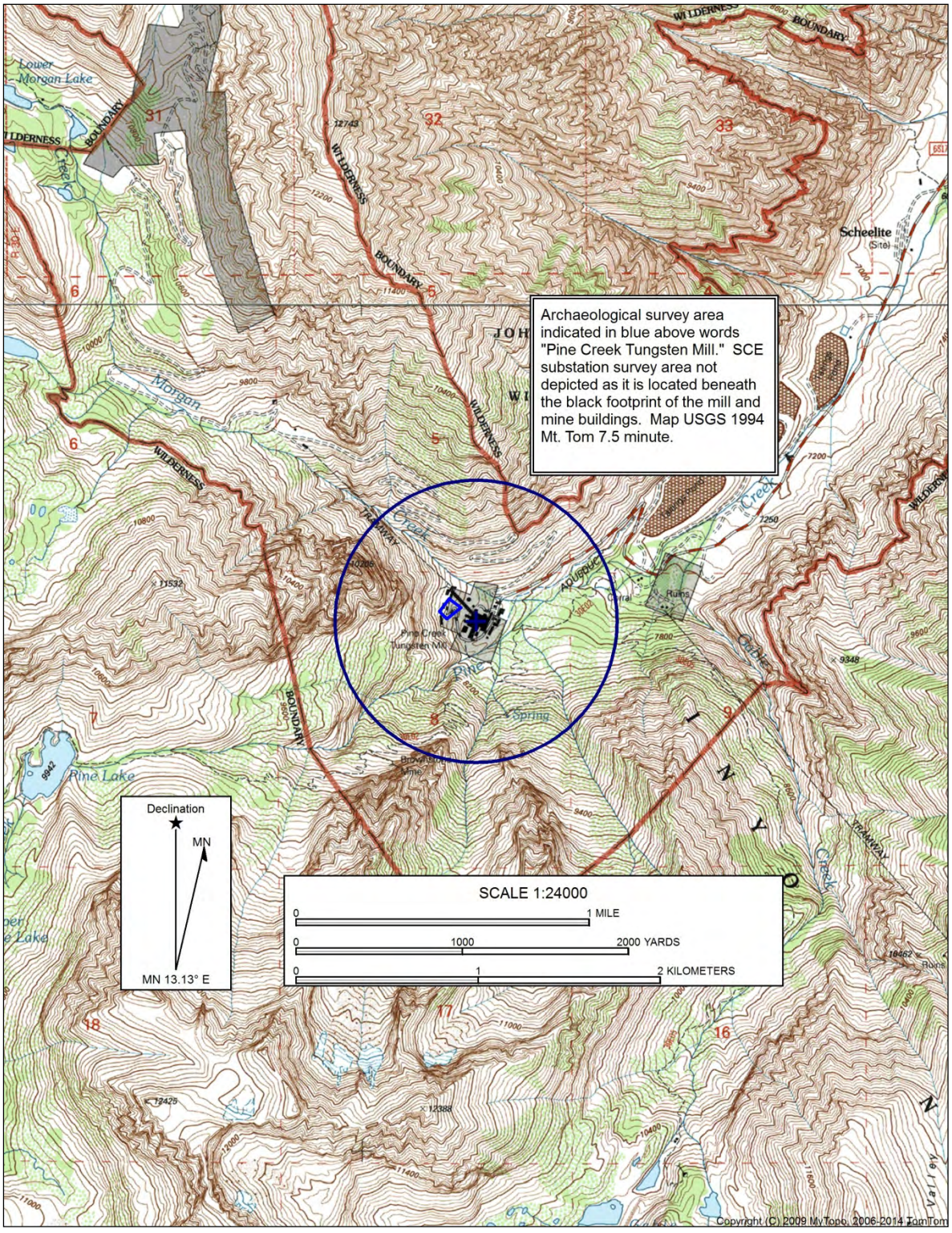

Figure 8. Archaeological survey map (1994, USGS, 7.5 Minute Quadrangle: Mt. Tom)

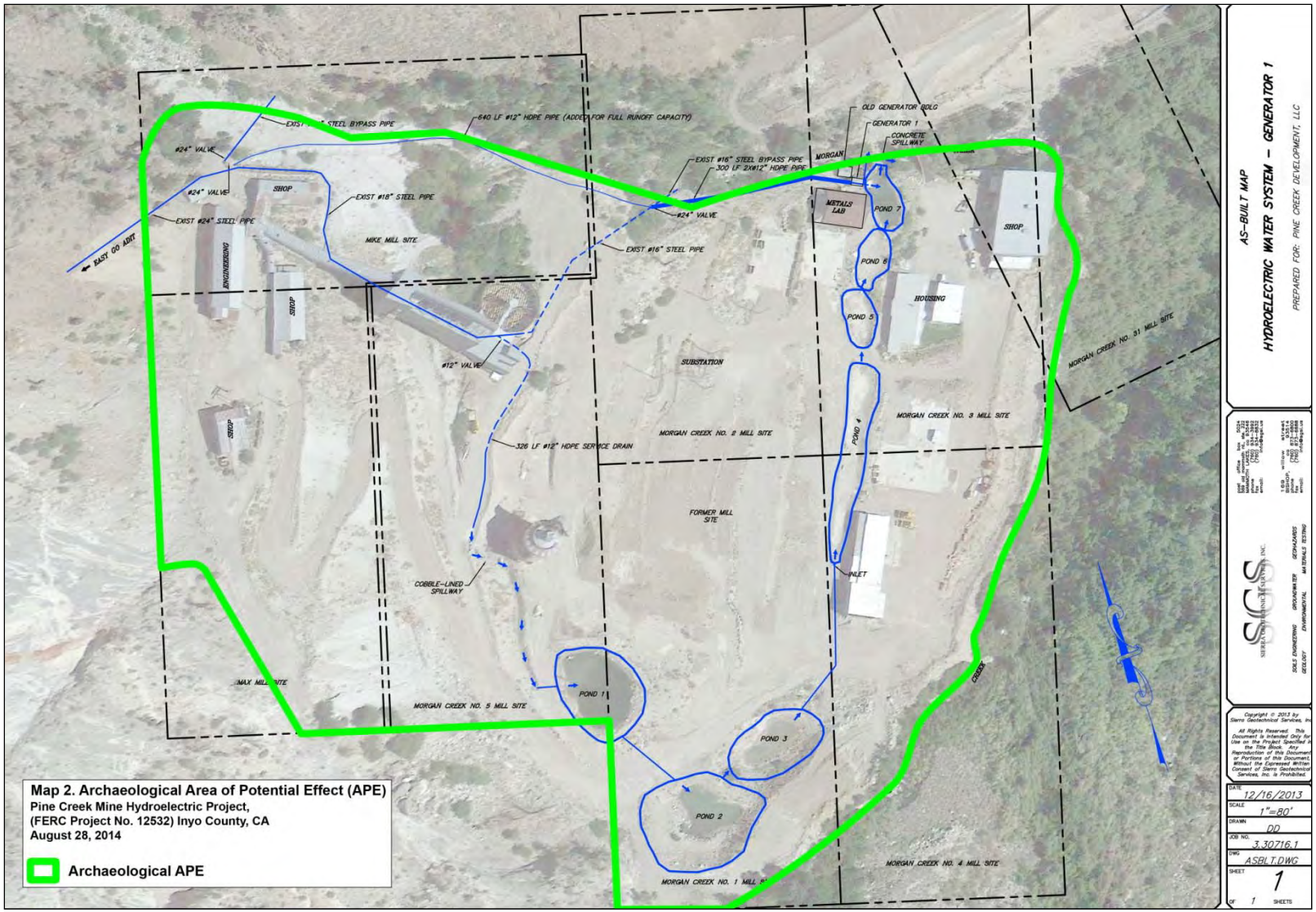

Figure 9. Archaeological survey coverage map

4 Native American Consultation (By S. Davis-King)

In April 2011 as part of the licensing process, FERC initiated consultation with the federally-recognized tribes with a connection to the Project area. Tribes contacted with regard to the proposed undertaking were:

1) Lone Pine Band Paiute-Shoshone Tribe: Letter asking if the Tribe would like to participate in the licensing process. No response received to date.

2) Fort Independence Community of Paiute Indians: Letter asking if the Tribe would like to participate in the licensing process. No response received to date.

3) Bridgeport Paiute Indian Colony of California: Letter asking if the Tribe would like to participate in the licensing process. No response received to date.

4) Bishop Paiute Tribe: Letter asking if the Tribe would like to participate in the licensing process. Letter received from the Tribe saying they would like to consult.

5) Big Pine Paiute Tribe of the Owens Valley: Letter asking if the Tribe would like to participate in the licensing process. The Big Pine Tribal Historic Preservation Office (THPO) responded that they would like to consult and be involved.

6) Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation: Letter asking if the Tribe would like to participate in the licensing process. No response received.

7) Bishop Paiute Tribe responded to Commission Invitation to say they would like to consult, and that there are of four pending applications within their area of interest.

This information, along with other consultation efforts, is found in Appendix F, which is a chronological log of agency and tribal contact.

Notice was sent to the California Native American Heritage Commission (NAHC; 15 February 2014), and a response received 19 February 2014 (Letter included in Appendix D). The NAHC maintains an atlas and files on sacred lands, and consultation with these documents failed to indicate the presence of Native American cultural places in the Project area. The letter did note that local tribes “consider the Round Valley/Rovana area very culturally sensitive.” The NAHC further recommended that Project information be sent to four tribes: the Big Pine Paiute Tribe, the Bishop Paiute Tribe, the Fort Independence Indian Community, and the Lone Pine Paiute-Shoshone Tribe.

Formal meetings were held with the Bishop Paiute Tribe THPO Tribal Historic Preservation Advisory Committee at their October 2013 monthly meeting. The group expressed that they had reviewed the documentation provided, and it appeared that the areas which might have had cultural issues have been compromised by the mining activities, and that it does not appear that there are resources that will be affected. Still, they wished it to be known that Pine Creek canyon is the location of the origin story of the Paiute people (see separate entry supra), and that it should be recognized as an important area. Yet,

they said, “the damage has been done.” It was also communicated that “There may be some trails in there that are important, and these old trails may still be there; they are probably outside of the project.” The THPO Advisory Committee can only pass information along to the Tribal Council, and ask the Tribal Council to make a decision about the Project. The THPO said he would refer to the Project to the Tribal Council and wished to attend the field meeting that would be held the following day (they later called to say they had a conflict and could not attend). A representative of the Bishop Tribe Economic Development Department called to discuss possible partnering with the Applicant on the hydroelectric project. The Project was described and contact information forwarded to the appropriate people. Follow up emails and telephone calls were placed and are listed in the Appendix F log. No comments from the Tribe have been received.

Formal meetings were held with the cultural department of the Big Pine Paiute Tribe and the Big Pine THPO in October 2013. The cultural committee representatives and the THPO visited the Pine Creek Mine and the Project area, investigated the Easy Go Adit Service Utility Portal area, and discussed the creation story about the Pine Creek area. The story told by Jennie Newland was read aloud, and tribal representatives were asked if they had concerns or issues they would like to bring up. It was conveyed that if the Project is as described, they thought they would not have any comments or concerns. The Tribe responded on the draft report with minor comments that have been addressed herein; memo is included in Appendix H.

Copies of this report have been sent to six tribal representatives, as listed below, for their review and comment. Consultation is ongoing.

Big Pine Paiute Tribe
Genevieve "Gina" Jones, Chair
ATTN: Bill Helmer THPO
P.O. Box 700
Big Pine, CA 93513

Bishop Paiute Tribe
Dale “Chad” Delgado, Jr., Chairman
ATTN: Raymond Andrews THPO
50 Tu Su Road
Bishop, California 93514

Bridgeport Paiute Indian Colony of California
John Glazier, Chairman
ATTN: Justin Nalder
P.O. Box 37,
Bridgeport, California 93517

Fort Independence Indian Reservation
Israel Naylor, Chairperson
ATTN: Priscilla Naylor, THPO
P.O. Box 67
Independence CA 93526

Lone Pine Paiute-Shoshone Tribe
Mary Weuster, Chairperson
P.O. Box 747
Lone Pine, California 93545

Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation
Billy Saulque, Chairman
567 Yellow Jacket Road,
Benton, California 93512

5 Response To State Historic Preservation Officer (SHPO) Letter (By S. Davis-King)

On May 13, 2013, the California OHP sent a letter (FERC 2013 0411 002) to Lynn Goodfellow, Applicant for the Pine Creek Mine Hydroelectric Project, regarding several concerns they had. These are listed below with comments.

5.1 Adequacy of APE

The SHPO did not agree that the APE designated in an earlier document (Westfield 2013) was

> sufficient to address the direct and indirect impacts of the project… . The APE and field surveys should be broad enough to consider the potential eligibility of the existing tungsten mine facilities, and any historical archaeological resources that may be associated with the mining facility, any resources beyond the FERC boundary that might be indirectly impacted by the undertaking, and any unidentified resources in the project vicinity. The APE as proposed does not include the site of the adjacent mining facilities or consider the potential for historic properties that may be unrelated to this historic use.

The present report addresses the issues of an APE, and defined a proposed the Archaeological APE above to include all areas of potential effect. Additionally, a much larger study area was surveyed to make sure that archaeological values would not be inadvertently damaged.

5.2 Ground Disturbance

The SHPO felt that the proposed Project would have ground disturbing activities to underground mining features. Specifically, they felt that the Project could not be “implemented without causing any ground

disturbance... [including] plugging the underground Easy-Go Adit, the installation of a new turbine at the proposed plug, and construction of a penstock." Additional information was requested.

This aspect of the Project is not strictly an issue related to historic properties, but the Applicant has provided the following in response to the SHPO's concerns.

> Contrary to the statement in the letter from your office, the concrete "plug" is an existing structural bulkhead, not a "proposed" improvement. Construction was completed over 10 years ago (2002) and seismic and geotechnical studies were performed on the plug and surrounding area by qualified and licensed professionals. The studies were approved by FERC as to their adequacy, for the purpose of this application in 2012. The hydroelectric equipment to be installed will be connected to the plug improvements in a matter of days and may be removed, as needed, for maintenance and/or replacement. We intend to secure the newly installed equipment on a movable platform (a prefabricated railcar with all required equipment attached) and roll it into place near the plug. Once located, the entire railcar will be secured to an existing concrete platform and bolted to the manifold on the plug. Hence, no ground disturbance will occur in or near the project vicinity with the exception of the small staging areas immediately outside the two portals.

As noted above, the areas outside both the 1970 Easy Go Adit and the Service Utility Portal were investigated for archaeological remains, with negative results.

5.3 Previous Research

The SHPO considered the previous research inadequate, and said the Applicant should conduct an appropriate records search and the Eastern Information Center, and if the Project area has not been surveyed, archaeological and built environment surveys will be necessary as part of the identification of historic properties required.

Contact with the EIC was made and search results were incorporated into this report. In addition surveys for archaeological and historical resources were conducted in the Project area and beyond, as described in this report.

5.4 Native American Consultation

The SHPO wrote that Native American consultation was insufficient

> due to the constrained time frame (seven days) placed on the contacted parties. Moreover, a request to participate in FERC's licensing process is not equivalent to an invitation to participate in government-to-government consultation for the purposes of Section 106. Please contact the Native American Heritage Commission to identify all of the tribes that may be affiliated with the proposed project area, including those that are

not federally recognized, as part of the good faith effort to identify any tribes that might attach significance to any historic properties.

The reader is directed to the Native American consultation section, infra. The NAHC was contacted, and tribal consultation is ongoing.

5.5 Additional Information Requested

The SHPO asked for two additional submissions: (1) a signed copy of Section 106 delegation of consultation authority letter from the FERC; and (2) photographs of the proposed Project site, including the tunnel, adit, and associated mining facilities. The letter delegating Section 106 responsibility is located in Appendix F and photographs of the mining facilities are included in the Historic Context and Overview section and those following below.

The SHPO received correspondence from the Forest concerning the ownership of the subject property claims and stating that the undertaking is located on federal land. The SHPO wrote that the "issue of land ownership and the designation of a lead agency needs to be resolved before Section 106 consultation can continue." This issue is not addressed nor is in the professional capabilities of the authors of this document.

The SHPO received correspondence from Sackheim Consulting regarding the Project, stating that "there are potentially three additional undertakings proposed by the Pine Creek Mine, LLC in the immediate vicinity of the Pine Creek Mine Hydroelectric Project. If this is the case, it would be advisable to consult on all of the proposed undertakings concurrently." The Pine Creek Mine has an existing small hydroelectric generation plant that was exempt from FERC licensing and is subsumed in the Project investigation area, and Project 12532. There are no additional projects being planned by the Applicant in this area.

6 Response To State Historic Preservation Officer (SHPO) Letter (By S. Davis-King)

On July 14, 2014, the California OHP sent a second letter (FERC 2013 0411 002) to Lynn Goodfellow, Applicant for the Pine Creek Mine Hydroelectric Project, largely regarding the absence of a defined APE.

6.1 Definition of APE

The OHP wrote that the "APE should be broad enough to consider the potential elibility of the existing tungsten mine facilities, and any historical resources tht may be associated with the mining facility, any resources beyond the FERC project boundary that might be indirectly impacted by the undertaking, and any unidentified resource in the project vicinity." This report defines both an Architectural and an Archaeological APE to include the mine features, and any nearby areas that might be impacted indirectly by the project. "Any unidentified resource in the project vicinity" is not specifically defined to have been addressed.

7 Meeting With Forest Service Representatives (By S. Davis-King)

Several meetings with the Forest were attempted, including the day before and the first day of the "government shutdown" in October 2013. Additionally, two telephone calls were made to the Forest to speak with the Forest Archaeologist, but the response was that the position was vacant and no one had filled the position. As a final attempt to consult with the Forest, contact as made on 13 February 2014 with Sheila Irons, Lands Specialist of the Mammoth and Mono Lake Ranger districts, and she said a new Forest Archaeologist had just been hired and she would make arrangements for the team to discuss the Project. A telephone conversation was held followed by a meeting on 21 March 2014, with the issues below discussed.

7.1 Impacts to the Mine Interior Workings

The Forest is concerned about adverse effects to the interior mine workings as a result of the Project, and what may have already occurred as a result of the plug. The nature of historic mine evaluations was discussed, and the fact that few mines are found eligible for the NRHP as a result of their interior workings, largely because safety issues prevent investigation and mapping of such remains, and because National Register Bulletin 42 (*Guidelines for Identifying, Evaluating, and Registering Historic Mining Properties*) specifically avoids inclusion of interior workings in the evaluation of mining properties. It was conveyed that sufficient archival data likely survive to convey important information about the mine's interior that would be satisfactory and support any eligibility statement if the mine is considered eligible for the NRHP.

7.2 Land Ownership Issues

As discussed above under the "Response to SHPO Letter," the authors of this report were not tasked to investigate land ownership issues that must be resolved at a legal level.

7.3 Downstream Impacts

The Forest expressed concerns that if the plug burst, there might be downstream affects to resources including other mining remains, historic homes, prehistoric resources, and more. The Applicant believes this has been addressed by Sierra Geotechnical Services in a study dated December 2011, filed in the FERC eLibrary as Submittal 20120209-5045. Additionally, the potential for downstream (indirect impacts) to potential historic properties can be addressed in a Heritage Resources Management Plan, if one is prepared, or in the official document used to conclude the Section 106 process.

A Table listing contracts with Agencies and Tribes is found in Appendix G.

8 Research and Field Methods (By L. Trew and R. Herbert)

8.1 Architectural Area of Potential Effect (APE)

JRP established the Architectural APE for this project in August 2014, which includes the surface indications of the mining property that may be potentially affected by direct or indirect elements of the proposed project. The APE encompasses the original mine site located at an elevation of 11,300 feet; the mining village and original mill site near Morgan Lake; the switch back road and remains of the aerial tramway; Zero Portal, Easy-Go Adit; Mill Site; and tailing piles east of the main entrance.

8.2 Research

JRP prepared the historic context and undertook research on relevant historic themes including tungsten discovery in Inyo County, development of mines, and the importance and history of the tungsten industry. JRP also researched Pine Creek development and operation, specifically, in both archival and published records at the following facilities: California Geological Survey Library in Sacramento; Pine Creek Mine, LLC; Shields Library at the University of California, Davis; JRP's in-house library; and at relevant online resources including CaliTrails.com, fdrlibrary.marist.edu, and usgs.gov. Please see the Bibliography section for a complete listing of materials consulted.

8.3 Field Methods

JRP conducted fieldwork between August 12th and 13th 2014. JRP inspected and photographed the remaining buildings, structures, and objects at Pine Creek Mine Easy Go and Mill complex areas and evaluated the property as a whole using NRHP and CRHR Criteria, particularly as they apply to mining complexes. JRP staff did not go to the upper mine sites, because all buildings or structures remaining had been completely demolished and removed. Additionally, the upper mine adits/portals have been sealed (Interview, Pete Belec and Tom Haenni, August 12, 2014). JRP also considered the complex as a historic landscape utilizing applicable National Park Service (NPS) bulletins to guide the evaluation. JRP recorded Pine Creek Tungsten Mine complex on one DPR 523 form attached as part of Appendix B. Additionally, JRP identified potential locally interested parties for this project and sent notification letters on August 26, 2014. Recipients of the letter included the Eastern California Museum, Mono Basin Historical Society, Laws Railroad Museum and Historic Site, and the Bishop Chamber of Commerce. No response has been received to date. A copy of the letter is provided in Appendix I.

9 Historic Context (By L. Trew and R. Herbert)

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.

9.1 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 3400º 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 claim lapsed when the assay results were obtained (*EMJ*, 10 April 1926:6).

9.2 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] WO_2 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 Inyo 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 daily 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 daily 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 (See Figure 11). 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 13). 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).

9.3 **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 10). 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).

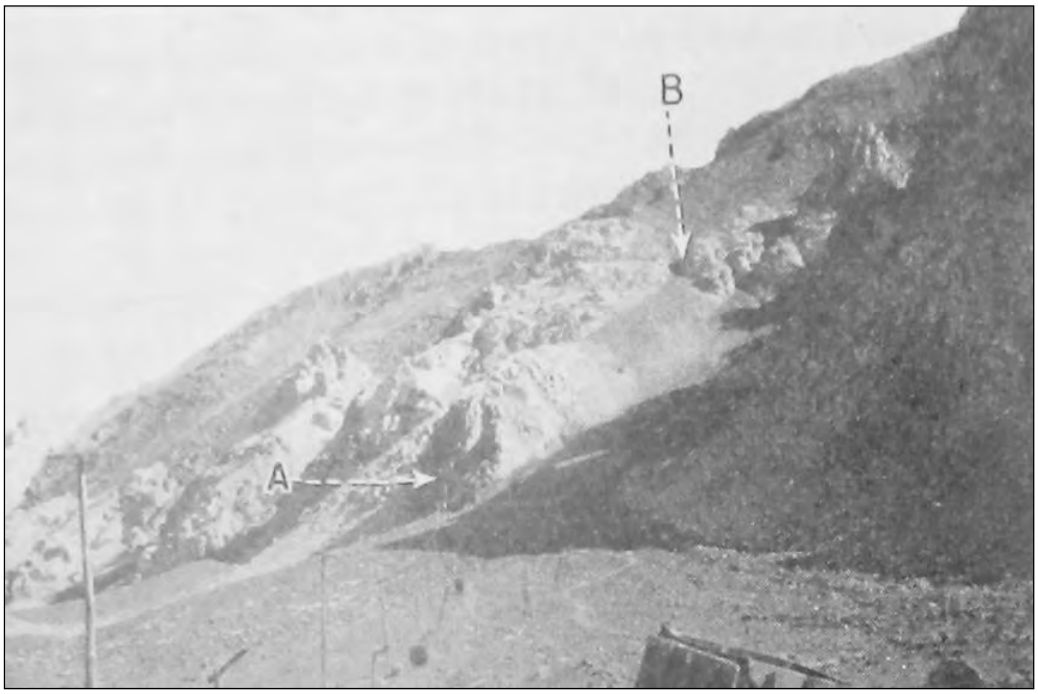

Figure 10. Outcrop of Tungsten deposit, showing upper and lower adits at B and A (Photograph from *Engineering and Mining Journal,* 10 April 1926:606).

For a 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 (DOI, BM 1938:568-570, 572).

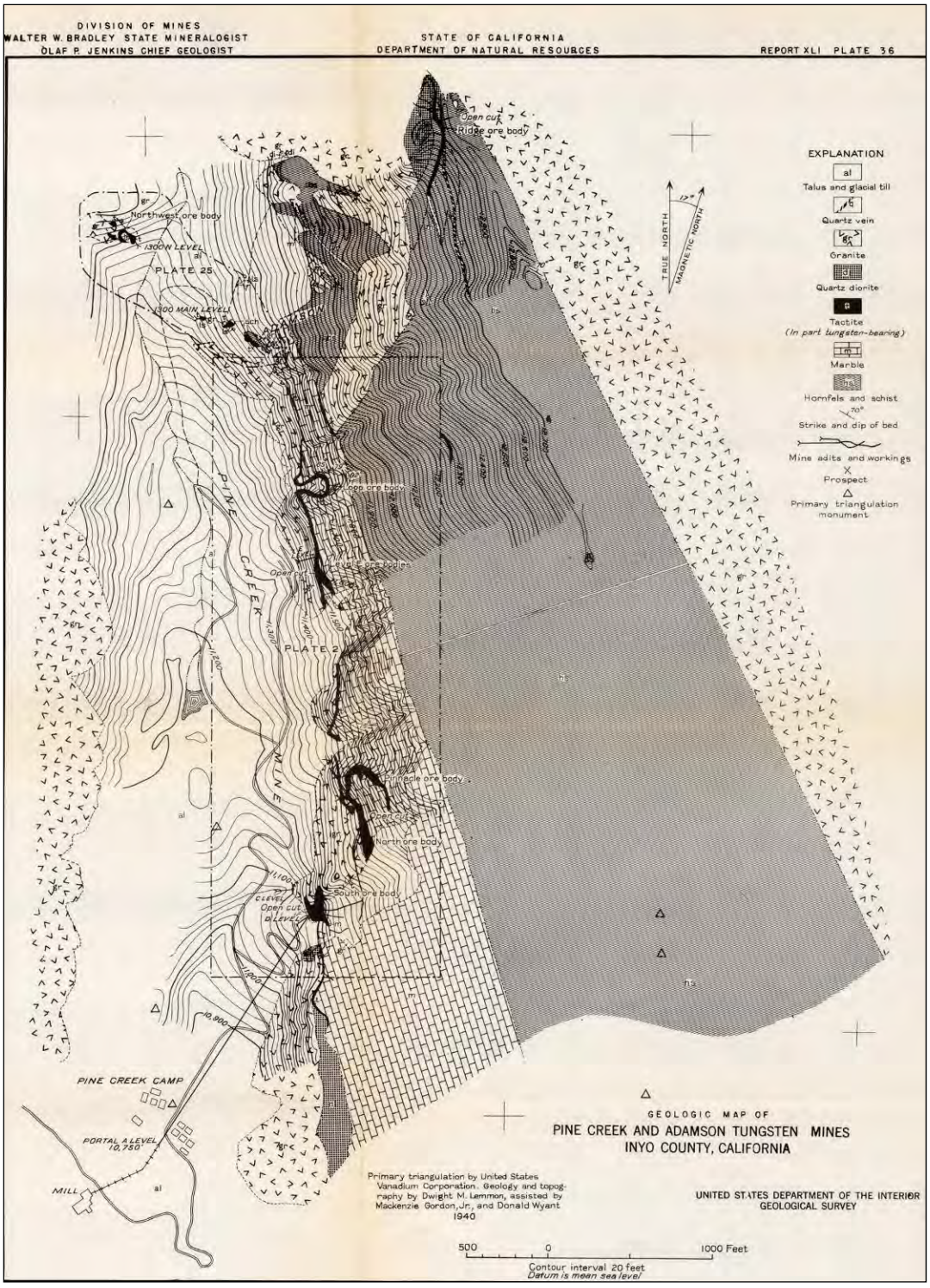

Figure 11. Map showing mine as it existed in 1940. Note Pine Creek Camp, Portal A and mill at lower left, at elevation 10,750 (State of California, Department of Natural Resources [SC,DNR], Report XLI, Plate 36, Geologic Map of Pine Creek and Adamson Tungsten Mines, Inyo County, California, 1940. California Geological Survey Library, Sacramento).

9.4 **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 WO_3) 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 14). They operated a mill with a 350 or 500 ton daily capacity at Pine Creek, and were constructing a mill with 1,200 to 1,300 ton daily 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 (See Figure 12) (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 5½ ft. short-head crusher set to a ¼ 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 12. 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).

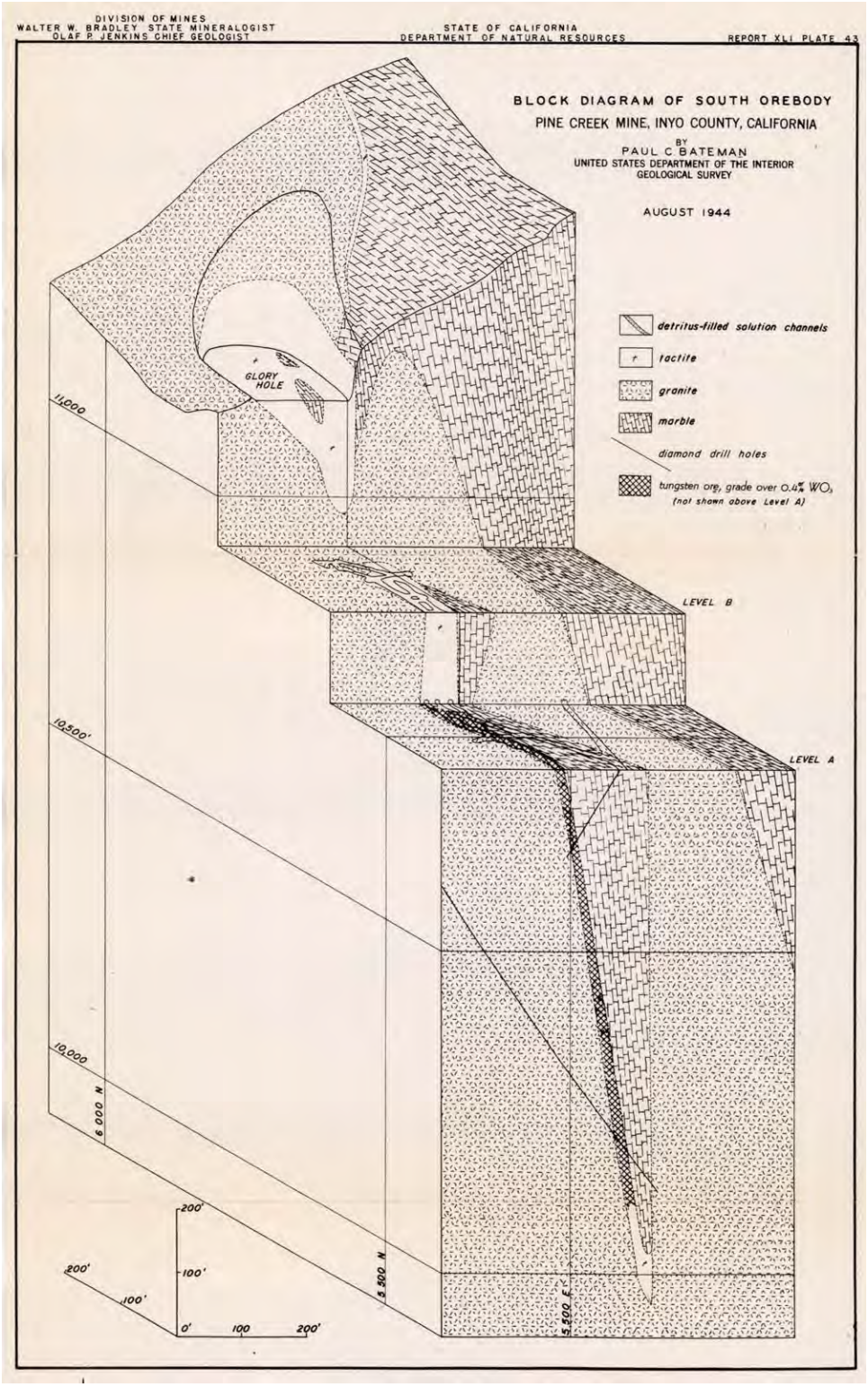

Figure 13. South Orebody showing mining levels and glory hole (State of California, Department of Natural Resources, Report XLI, Plate 43, *Block Diagram of South Orebody, Pine Creek Mine Inyo County, California,* August 1944. California Geological Survey Library, Sacramento) (SC, DNR 1944a).

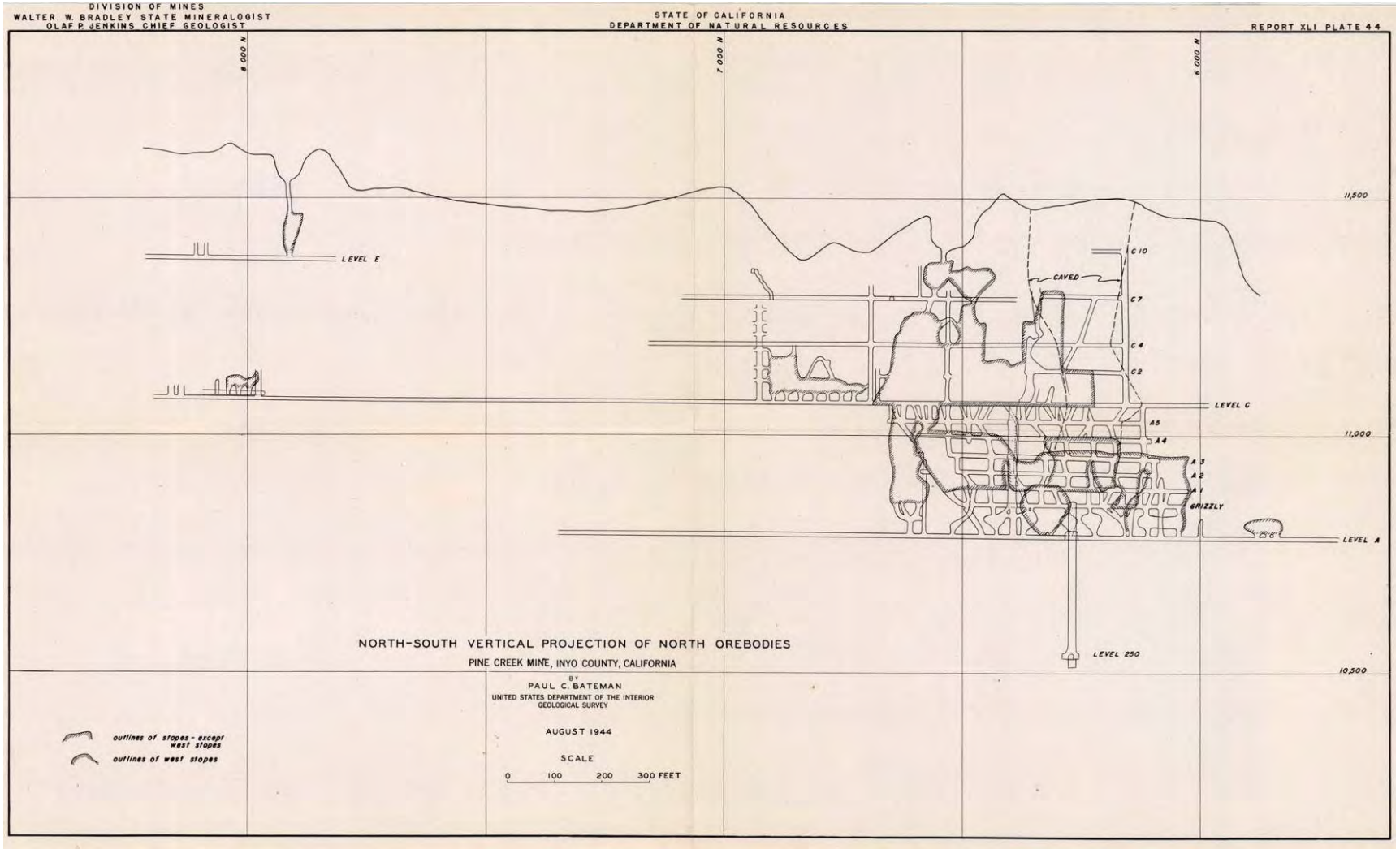

Figure 14. North-South Vertical Projection of North Ore bodies, showing mining levels as of 1944 (State of California, Department of Natural Resources, Report XLI, Plate 44, *North-South Vertical Projection of North Ore bodies, Pine Creek Mine Inyo County, California,* August 1944. California Geological Survey Library, Sacramento) (SC, DNR 1944b).

9.5 **Korean War and Government Stockpile Program (1950 – 1958)**

In June of 1950, North Korea invaded South Korea because of a dispute over the boundary set 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 lbs), 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).

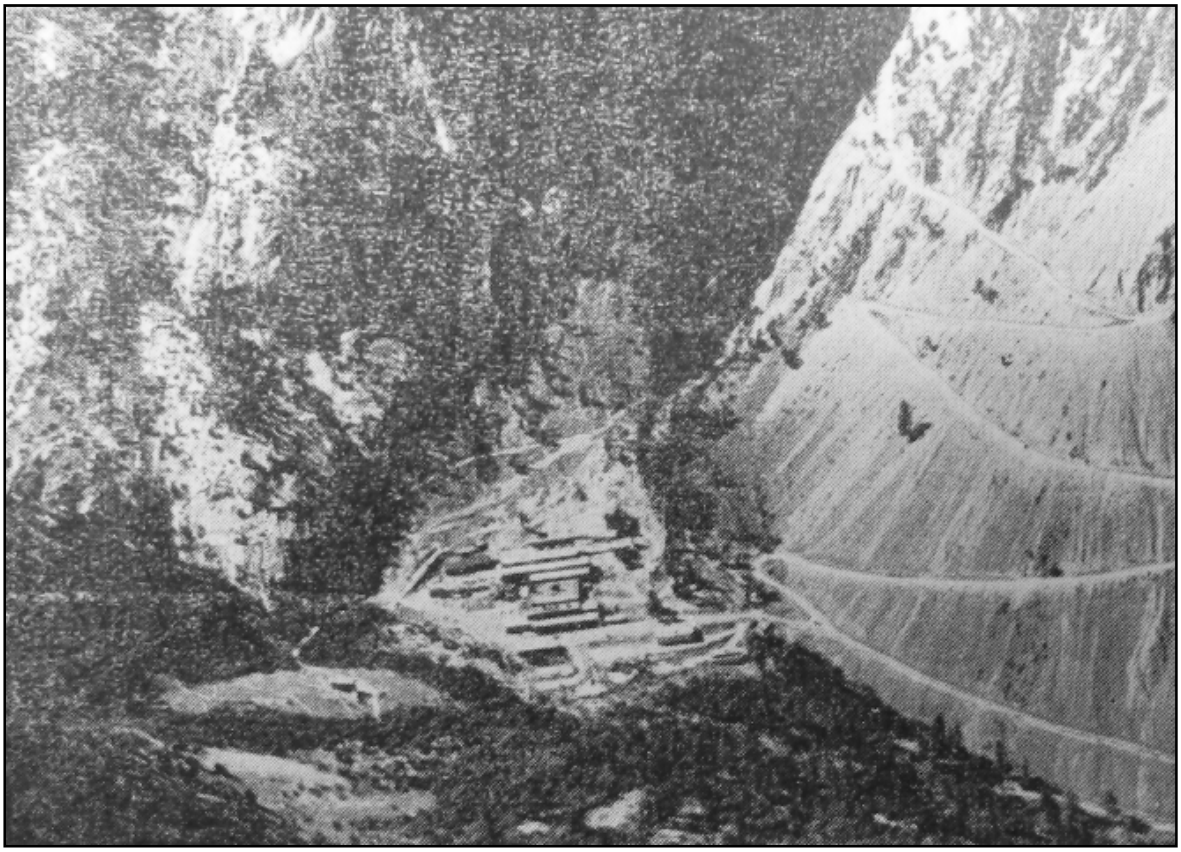

Figure 15. Largest US Producer of tungsten, United States Vanadium Company's Pine Creek mine, Bishop California, expands production to meet defense demands. Mill appears above, road leads up to Zero Tunnel, at 9,300 ft. elevation (Photograph from *Engineering and Mining Journal,* May 1951: 76).

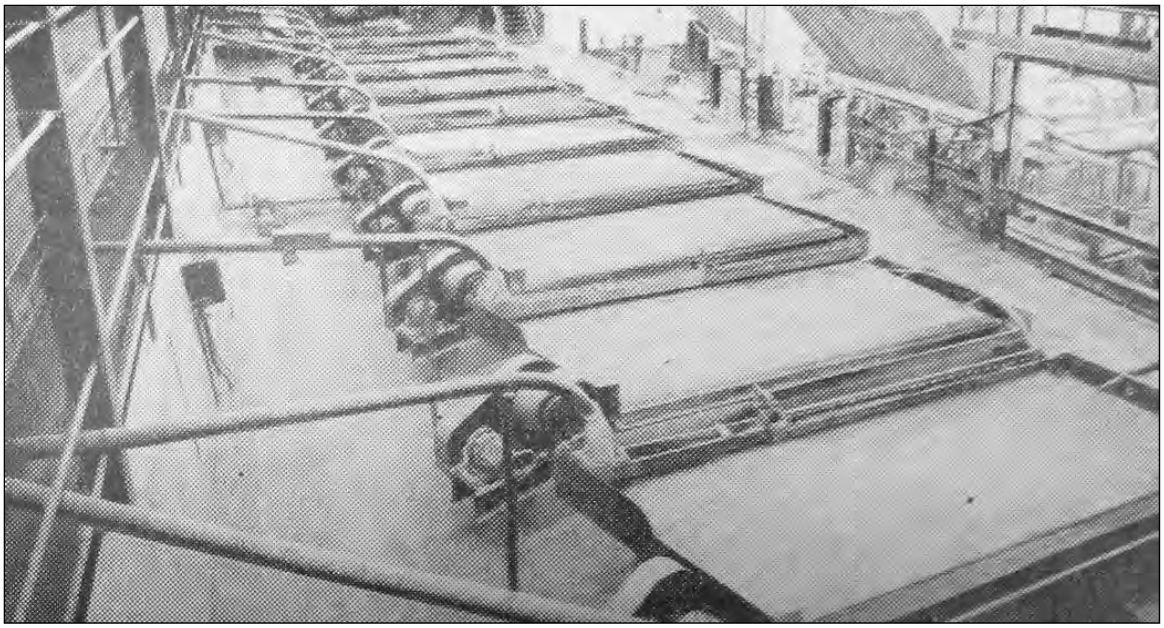

Figure 16. Tables separate coarse scheelite for regrinding, and make high-grade concentrate for shipment at Pine Creek (Photograph from *Engineering and Mining Journal,* May 1951:83).

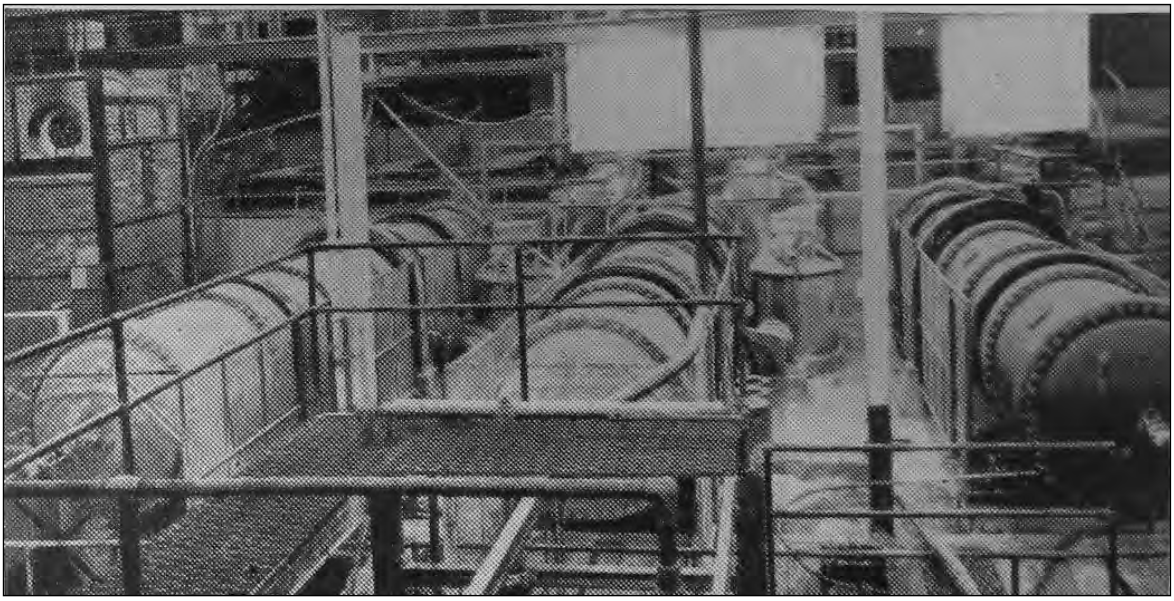

Figure 17. Pressure digesters at the Chemical Plant at Pine Creek helped purify tungsten and molybdenum products from concentrates. (Photograph from *Engineering and Mining Journal*, May 1951:83).

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 18).

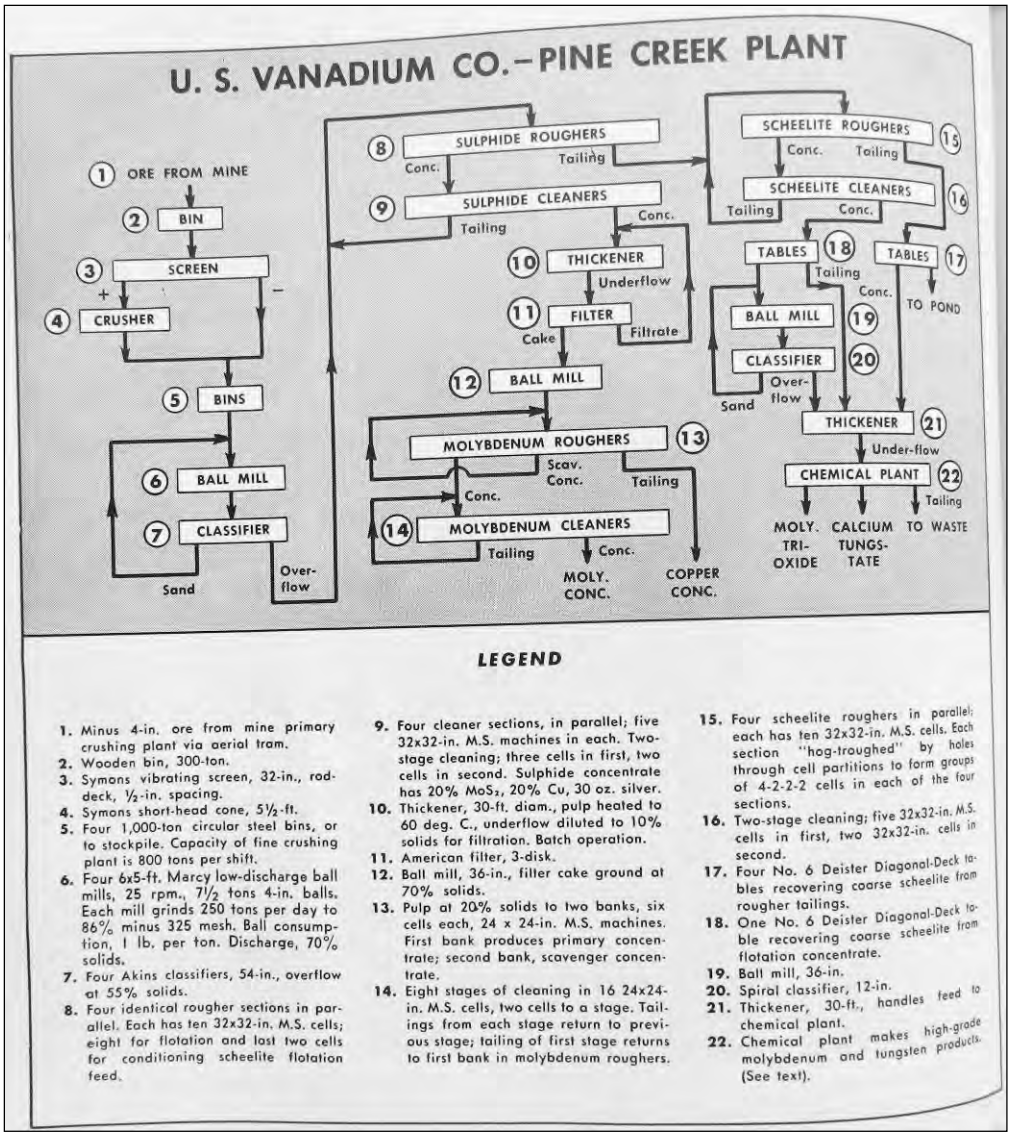

Figure 18. Mill flowsheet from *Engineering and Mining Journal*, May 1951:82.

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).

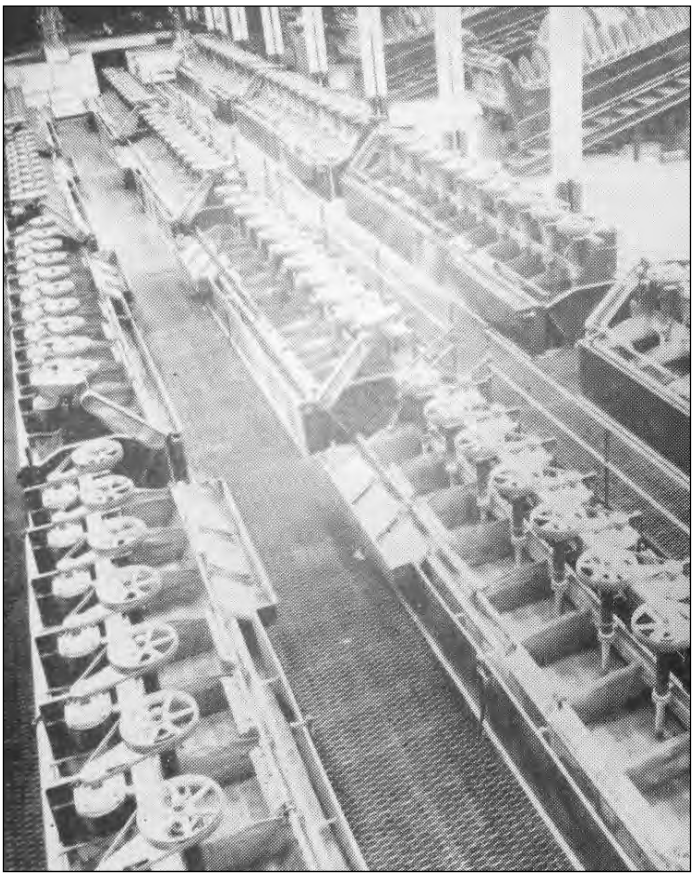

Figure 19. Flotation Section at Pine Creek uses M.S. machines, makes copper, molybdenum, and scheelite concentrate (Photograph from *Engineering and Mining Journal,* May 1951:83).

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).

9.6 **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, for a 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 20), 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).

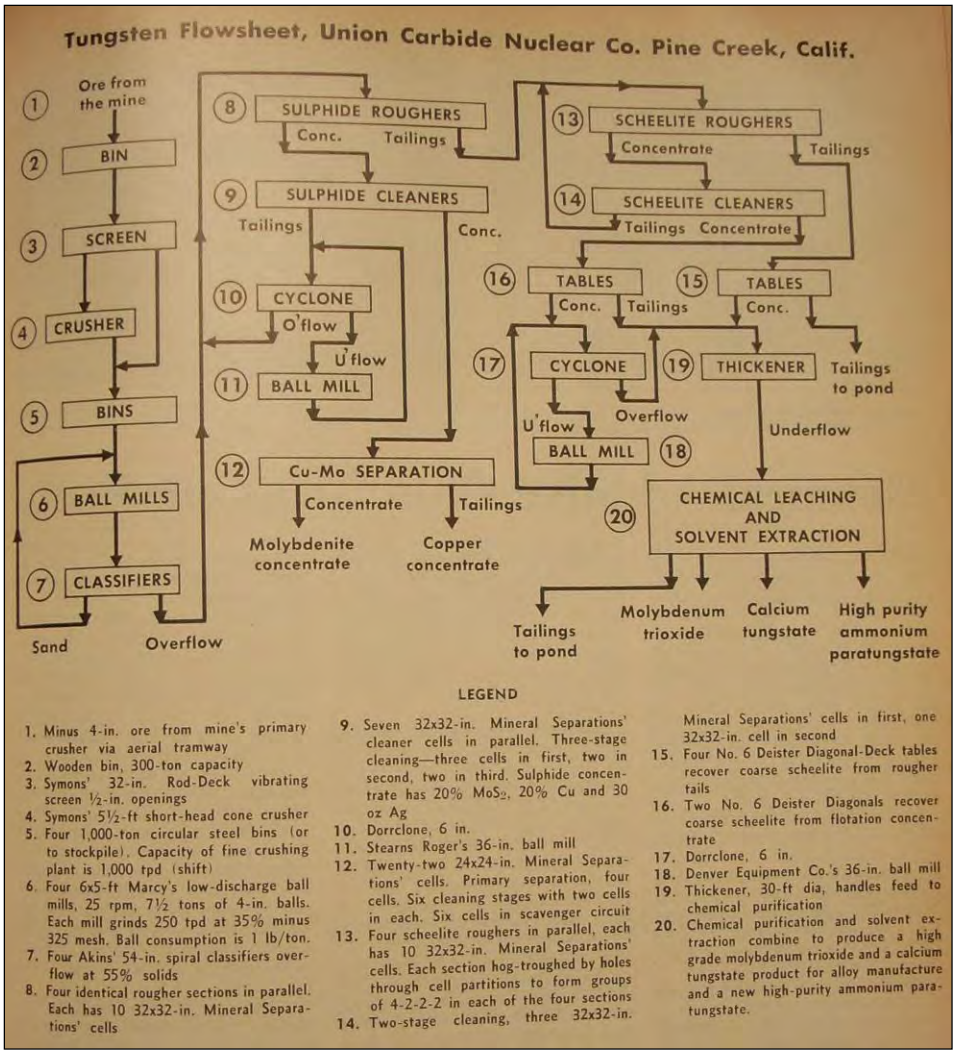

Figure 20. Mill flowsheet from *Engineering and Mining Journal*, October 1959:103.

Ore grades dropped as the mine's resources 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).

9.7 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).

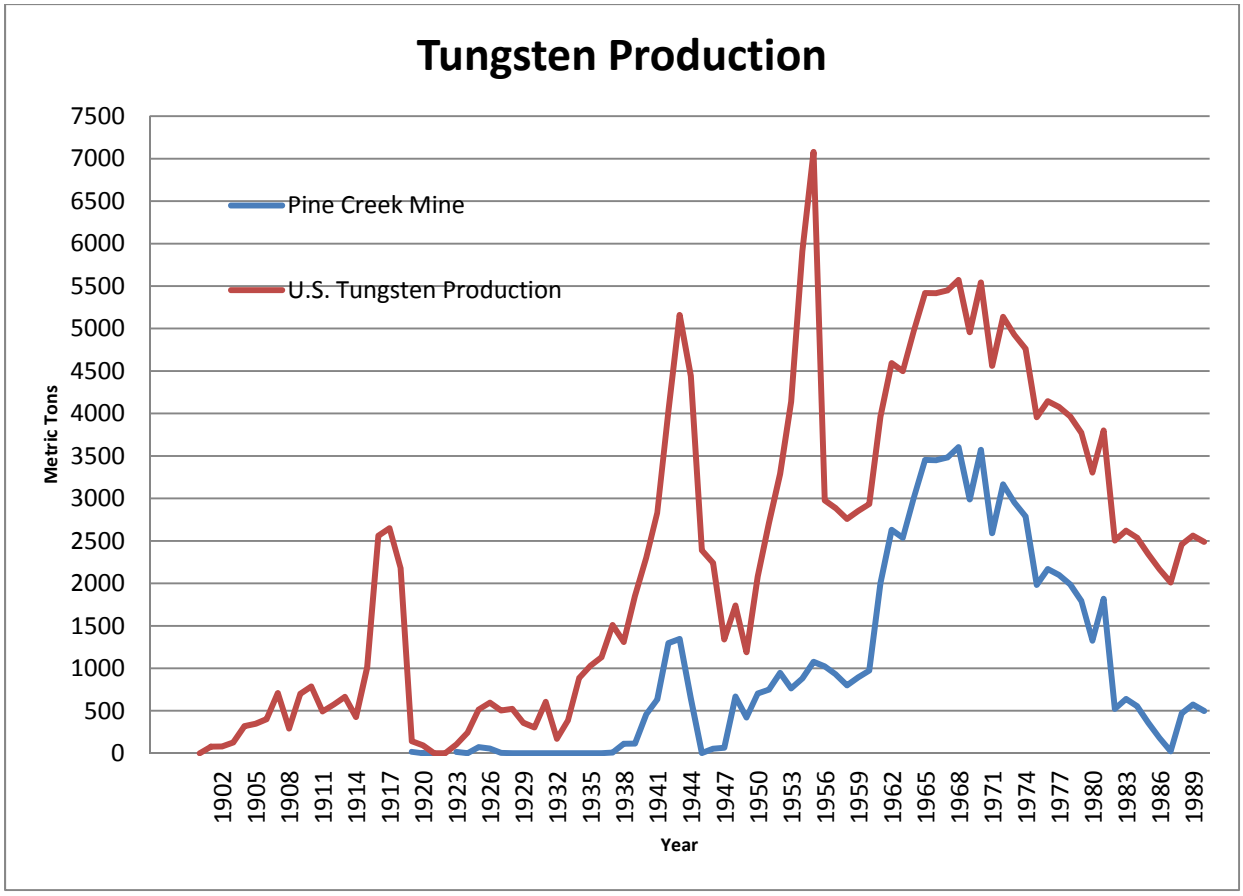

Figure 21. Tungsten Production (Kurtak 1998:198-1999; USGS 2012). USGS provided information for Tungsten production in the United States in two categories "Primary Production" and "Secondary Production," which were added together to create a total production number used for this table. Pine Creek Mine production information furnished by Kurtak was listed in Units of WO_3, which was converted into metric tons for use in this table.

10 Description of Resources (By L. Trew and R. Herbert)

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 remains closed today and many of the primary buildings at the mill site have been demolished, including the mill, the analytical lab, and carpenter and machine shops. Foundations for some of these are visible. There are some support buildings and structures, mill equipment, and mine adits existing at the mill site (See Figure 22). Additionally, some of the aerial tramway towers and sections of road remain along the mountain side. For detailed descriptions of individual buildings and structures see the DPR 523 form attached as part of Appendix B.

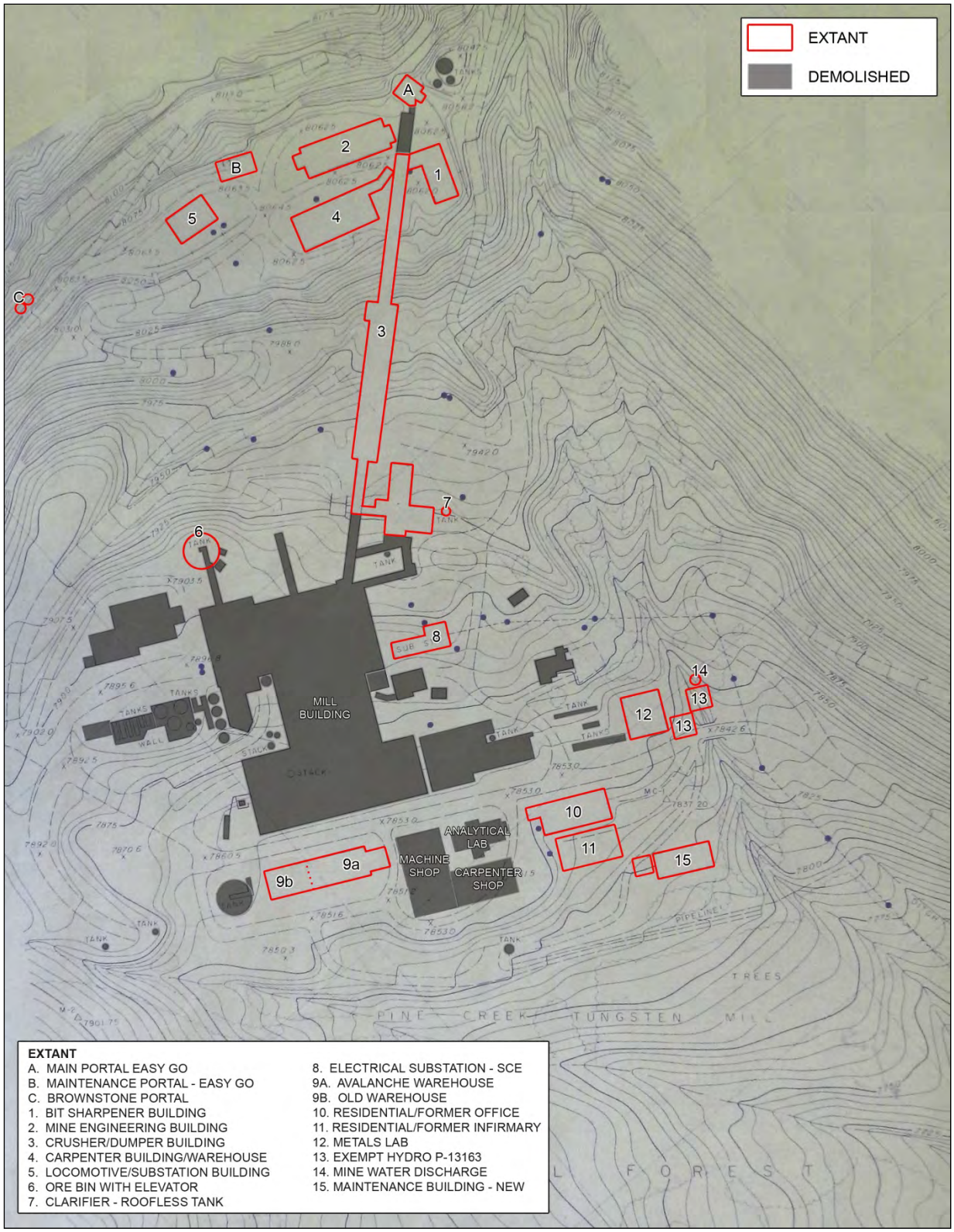

Figure 22. Mill Site near Easy Go showing extant and demolished buildings (Base map, "Pine Creek Mine, Inyo County, California, Property Map," no date; provided by Pine Creek Mine).

Figure 23. Pine Creek Mill Site at junction of Pine and Morgan Creeks ca. 1959 (Photograph provided by Pine Creek Mine LLC).

Figure 24. Pine Creek Mine facing northwest (Photograph provided by Brian Schmalz May 27, 2012, http://calitrails.files.wordpress.com/2012/05/pinecreek-mine.jpg). The Easy Go adit is near the crusher building (built 1970) in the center of this image.

11 Findings and Conclusions for Historic Resources (By L. Trew and R. Herbert)

11.1 Eligibility Criteria

The eligibility criteria for listing in the NRHP are codified in 36 CFR Part 60. They are further expanded upon in numerous guidelines published by the Keeper of the National Register.[1] Eligibility to the NRHP rests on twin factors of significance and integrity. A property must have both significance and integrity to be considered eligible for listing in the NRHP. Loss of integrity, if sufficiently great, will overwhelm the historical significance of a resource and render it ineligible. Likewise, a resource can have complete integrity, but if it lacks significance, it must also be considered ineligible.

Integrity refers to the ability of a site to convey its significance, and is determined through application of seven factors including location, design, setting, workmanship, materials, feeling, and association. Mining sites are almost never found intact, complete with equipment, buildings, and related structures in the condition they were in at the time the mine ceased activities. A resource must maintain several of these aspects to maintain integrity. This is true of mining sites; however, some adjustment of degree is allowed in assessing lack of integrity. *Bulletin No. 42* provides detailed guidance on how to address integrity for mining sites.

Historical significance is judged by application of four criteria, denominated A through D.

> Criterion A: association with "events that have made a significant contribution to the broad patterns of our history"
>
> Criterion B: association with "the lives of persons significant in our past"
>
> Criterion C: resources "that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction"
>
> Criterion D: resources "that have yielded, or may be likely to yield, information important to history or prehistory."

While the same criteria are applied to mines as other cultural resources, mining resources that may or may not have above-ground remains differ in the way they are evaluated against the criteria. It should

[1] The most widely accepted guidelines are contained in U.S. Department of the Interior, *Guidelines for Applying the National Register Criteria for Evaluation*, National Register Bulletin 15. (U.S. Government Printing: 1991).

be noted that mining complexes that appear to meet the criteria for listing in the NRHP are typically evaluated as single complexes.

In the application of these criteria significance and integrity are linked. The type of significance and period of significance provides the baseline or standard against which integrity is measured. In addition, a resource must be at least fifty years old in order to be eligible for the NRHP, unless it meets specific and exacting criteria for special significance under Criteria Consideration G "a property achieving significance within the last fifty years is eligible if it is of exceptional importance."

In addition to consideration under the NRHP, these properties have also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5025.1 of the California Public Resources Code, resources associated with important events that have made a significant contribution to the broad patterns of our history.

11.2 Evaluation

Taken as a complex, the Pine Creek Tungsten Mine has significance under Criteria A and B, but lacks sufficient integrity to meet the criteria for listing in the National Register of Historic Places. One building, however, the mine's Building No. 12, Metals Lab, appears to meet the criteria for listing in the National Register and California Register under Criteria A and 1, and B and 2, as explained below.

11.2.1 Application of National Register / California Register Criteria

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.

Integrity

Integrity is the ability of a property to convey its historic significance, in the case of mining properties NPS *Bulletin 42* states,

> the passage of time, exposure to a harsh environment, abandonment, vandalism, and neglect often combine to cause the deterioration of individual mining property components … However, the property may still exhibit a labyrinth of paths, roads, shaft openings, trash heaps, and fragments of industrial activity like standing head frames and large tailings piles. Although these individual components may appear to lack distinction, the combined impact of these separate components may enable the property to convey the collective image of a historically significant mining operation. In essence, the whole of this property will be greater than the sum of its parts (NPS: 19).

Pine Creek retains integrity of location and association, because it remains in its original location and retains its association with mining. It does not, however, evoke the feeling of an active mining property.

Mine and mill sites experience an evolution of development over the course of their active lifespan, and mining "plants found in an unaltered state are rare," notes the NPS. "Thus, contemporary evaluation of a mill's integrity should not only be based on its conformance with an original construction plan, but also on its ability to illustrate the property's evolution through time" (NPS: 20). Pine Creek's original mill site and housing quarters have all been demolished, in some cases, buildings were destroyed by avalanches, but all upper mining and milling structures have been completely removed in anticipation of an environmental restoration plan. As the mine evolved, its center of activities moved down the mountain to lower elevations to operate its milling equipment at safer places with easier access. The tramway

towers and the Easy Go Adit are illustrations of this development and evolution at Pine Creek. As the NPS states, "Mining operations were designed to follow established mine engineering practices that involved the flow of ore from the mine to the mill to the refinery. The engineering flow chart is essential in understanding integrity of design" (NPS: 20). Reviewing the mining flow chart established in 1959, after the implementation of the APT process, reveals integral parts of the mining process that are no longer reflected at Pine Creek because of demolition of the mill and other important processing facilities. All the equipment and buildings that housed the parts of the process discussed in the flow chart between stages 6 and 20 are no longer evident at Pine Creek Mine (see Figure 20). The location of the mill is only evident by the grading of the earth. Pine Creek does not have integrity of design, because of the loss of the mill building and equipment as illustrated by the flow sheet and by an undated property map. The only remaining building importantly associated with the APT process is Building No. 12, the Metals Lab (see Figure 22; Table 1).

Pine Creek Mine also has slightly diminished integrity of setting, because of the addition of ponds. These were added in 2005 after the mine shut down, and are not associated with the mine's historic significance (see Figure 24). They slightly diminish the industrial feeling of the mine site as well.

National Park Service *Bulletin 42* states that to retain "integrity of materials requires evidence that sympathetic materials have been used during the course of previous repair or restoration of mining properties" (NPS: 21). Pine Creek does not retain integrity of materials. It is evident that the extant buildings dating to the original construction period of the mill site have been altered by the replacement and removal of doors and windows. In some cases, window replacements have altered the opening size and shape as seen on buildings No. 9a and 9b. Windows have also been replaced on building No. 10 and No. 11. Doors have been added, removed, and replaced on building No. 9a, 9b, 10, and 12. Most buildings that remain were built in 1970 during Pine Creek's peak operational period (See DPR form in Appendix B for photographs and construction dates).

Bulletin 42 concludes that overall integrity "will frequently hinge not so much on the condition of extent buildings, but rather on the degree to which the overall mining system remains intact and visible. ... If clear physical evidence of a complete system remains intact, deterioration of individual aspects of the system may not eliminate the overall integrity of the resource (NPS: 21)." Pine Creek Mine may retain some evidence of an overall mining system as demonstrated by the mill grading and foundations for minor buildings like the Carpenter and Machine shops that were adjacent to building No. 9a and 9b. Pine Creek Mine, as a whole, does not retain sufficient integrity required for listing in the NRHP or the CRHR, because very little remains that conveys the mine's historical significance.

Pine Creek, while a large producer, is not significant as a mine, because its mining processes were like other subterranean mines. Most remaining improvements do not date to the period of significance (1959-60), and are not individually eligible for listing in the NRHP or CRHR (Table 1). Pine Creek's significance lies with the mill and buildings associated with the APT process, of which only Building 12 survives to convey that history.

Extant Improvement	Built Date
A – Main Portal Easy Go	**1970**
B – Easy Go Maintenance Portal	**1970**
C – Brownstone Portal	**1974**
1 – Bit Sharpener Building	**1970**
2 – Mine Engineering Building	**1970**
3 – Crusher/Dumber Building	**1970**
4 – Carpenter Building/Warehouse	**1970**
5 – Locomotive/Substation Building	**1970**
6 – Ore Bin	**1970**
7 – Clarifier Tank	**1970**
8 – Electrical Substation – SCE	**1984**
9a – Avalanche Warehouse	**1970**
13 – Exempt Hydro P-13163	**1980-82**
14 – Mine Water Discharge (Surge Chamber)	**2005**
15 – New Maintenance Building	**Ca. 1970-1980**
16 – Front Entrance Bridge	**2005**
17 – Easy Go Access Road	**1960**
P0 – Mine Water Discharge Pipe	**1970**
P1 – Mine Water Discharge Pond	**2005**
P2 – Mine Water Discharge Pond	**2005**
P3 – Mine Water Discharge Pond	**2005**
P4 – Mine Water Discharge Pond	**2005**
P5 – Mine Water Discharge Pond	**2005**
P6 – Mine Water Discharge Pond	**2005**

Table 1. List of Existing Improvements not associated with period of significance.

Table 2 identifies extant buildings that existed during the period of significance. The method for APT developed in the Metals lab (Building 12) was tested at a pilot plant in Pine Creek Canyon that is now demolished and completely removed. The mill site does not clearly illustrate the significance of the APT process, because nothing remains of the mill building. Buildings 9b, 10 and 11, Morgan Creek Road, tramway towers, and tailing ponds, dating to the period of significance, do not convey the historical significance; therefore they could not be included in a historic district. Additionally, these buildings are not individually eligible for listing in the NRHP or CRHR.

Extant Improvement	Built Date
9b – Old Warehouse	**1941**
10 – Residential/Former Office	**1941**
11 – Residential/Former Infirmary (moved ca. 1960)	**1941**
12 – Metals Lab	**1941**
18 – Morgan Creek Road	**1939**
19 – Tramway Towers	**1941**

Table 2. List of Existing Improvements associated with the period of significance.

Building No. 12, the Metals Lab, retains integrity of location, design, setting, materials, and workmanship despite the addition to the rear and the personal door to the front. These added features

do not significantly diminish the building's integrity. The addition is in the back, and does not extend above the building or significantly alter its size and massing. The personal door on the south facing side does not significantly alter the appearance of the front of the building. Integrity of setting and association has been affected by the removal of buildings once located at this mine site. However, these changes do not affect the building's ability to convey its significance (See Photograph 1; Photograph 2).

Photograph 1. Building 12 – Metals Lab; facing north; August 12, 2014.

Photograph 2. Building 12, taken from Pine Creek mill at Junction of Pine and Morgan Creek Ca. 1959 (Photograph provided by Pine Creek Mine LLC).

12 REPORT CONCLUSIONS

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 Inyo 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).

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14 Preparers' Qualifications

The ethnographic and archaeological portions of this report were written by Shelly Davis-King (B.A., Anthropology, University of California, Santa Barbara; M.A, Anthropology, University of Arkansas, Fayetteville; Doctoral research University of Cambridge, Cambridge, England), principal and owner of Davis-King & Associates (DKA) with more than 40 years of experience in conducting cultural resources investigations. Ms. Davis-King is the Principal Investigator for the project, was responsible for Native American outreach, archaeological investigations, and general project oversight. She qualifies as a prehistoric and a historical archaeologist under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61), and as an ethnographer as described in National Register Bulletin 38.

The Historic Resources portion of this project was conducted under the general direction of Rand F. Herbert (MAT in History, University of California, Davis), a principal at JRP with more than 30 years of experience conducting these types of studies. Mr. Herbert provided overall project direction and guidance, conducted fieldwork, and reviewed and edited this report. Based on his level of experience and education, Mr. Herbert qualifies as a historian/architectural historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

JRP Staff Historian Leslie Ann Trew (MA, Public History, California State University, Sacramento) conducted fieldwork and research and was the primary author of the historical sections of this report, including the DPR 523 form. Ms. Trew qualifies as an architectural historian and historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

Appendix A: Maps

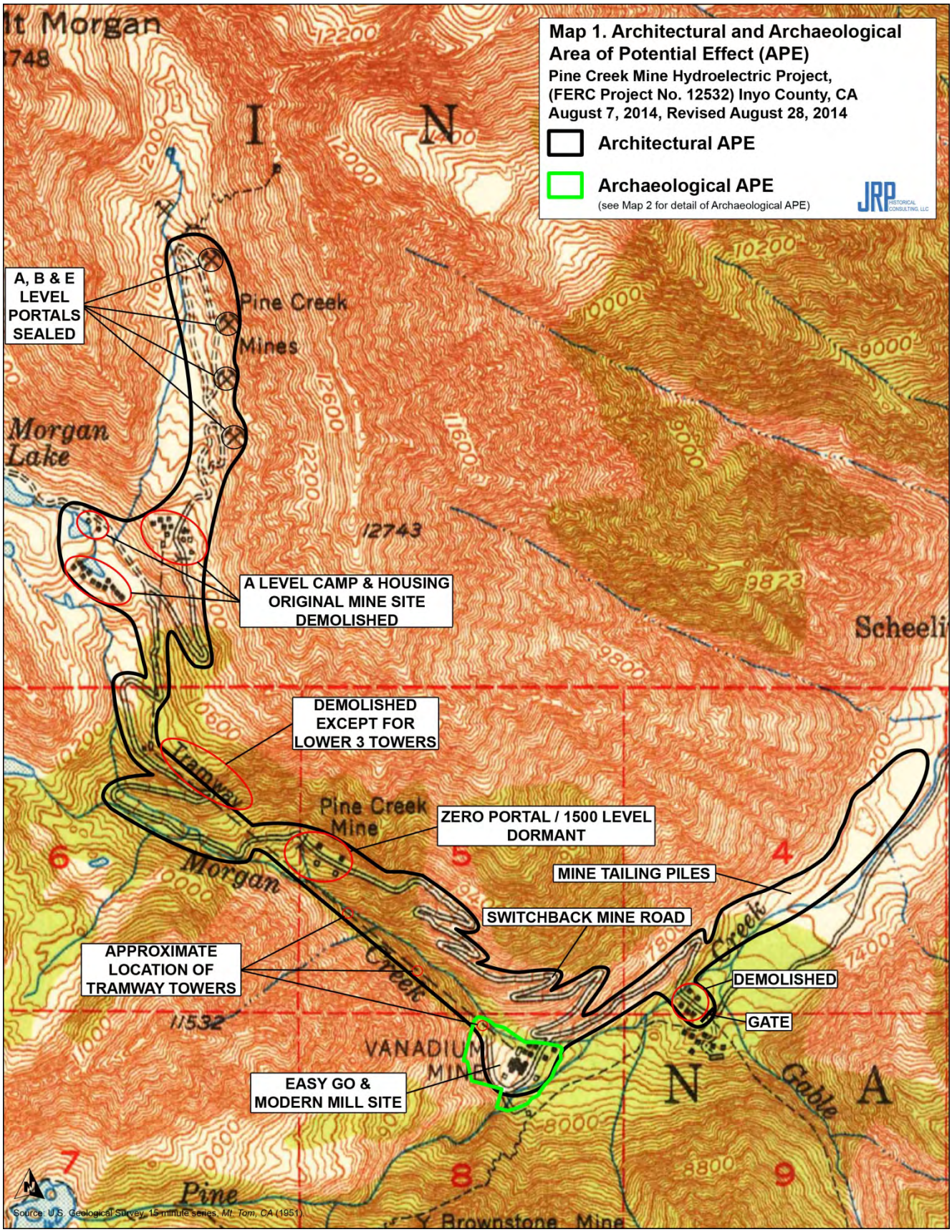

Figure A1, Map 1: Area of Potential Effect (APE)

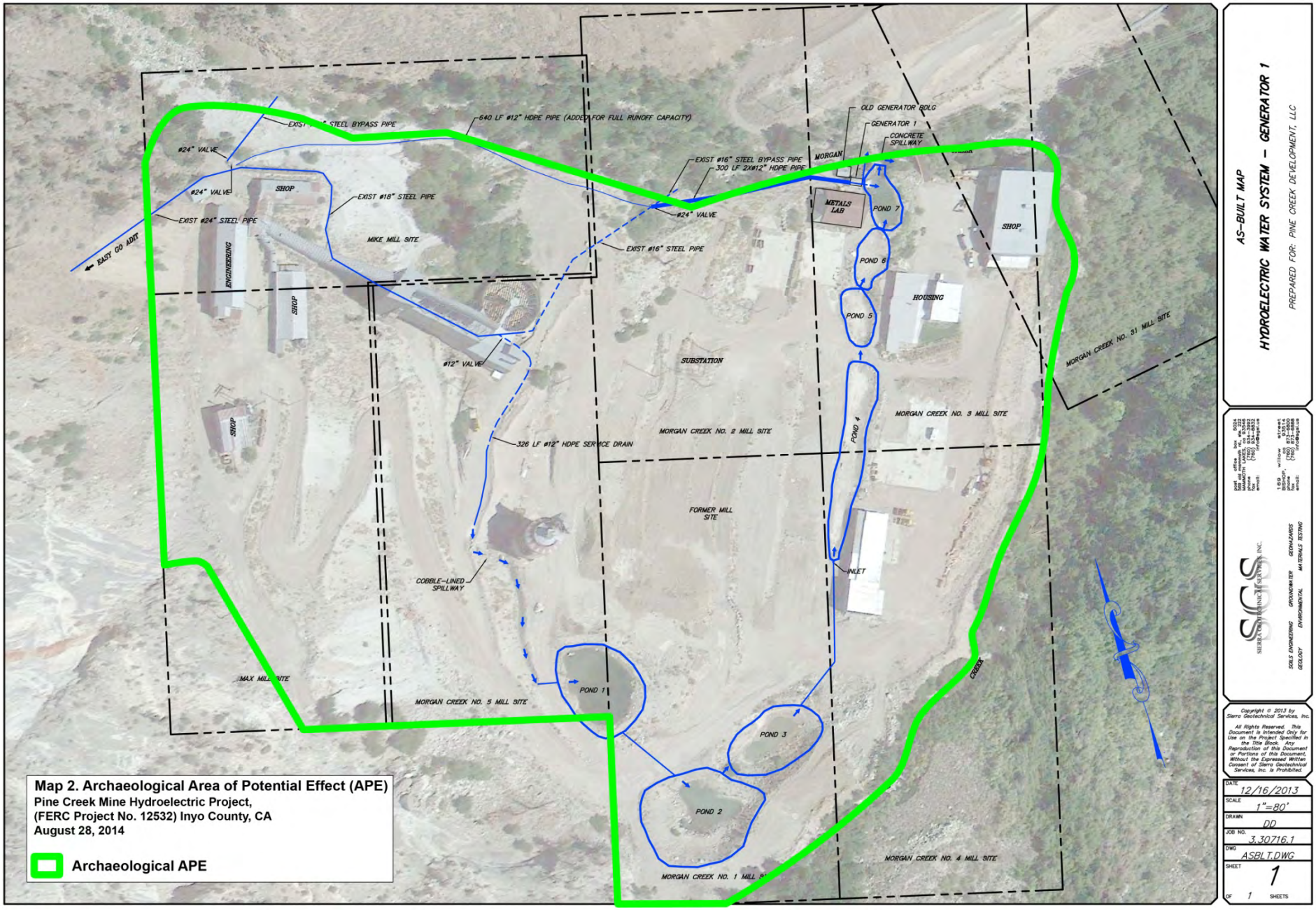

Figure A1, Map 2: Detail Archaeological APE

Appendix B: DPR-523 Forms

(Previous Study)

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

EIC

Primary #
HRI #
Trinomial
NRHP Status Code

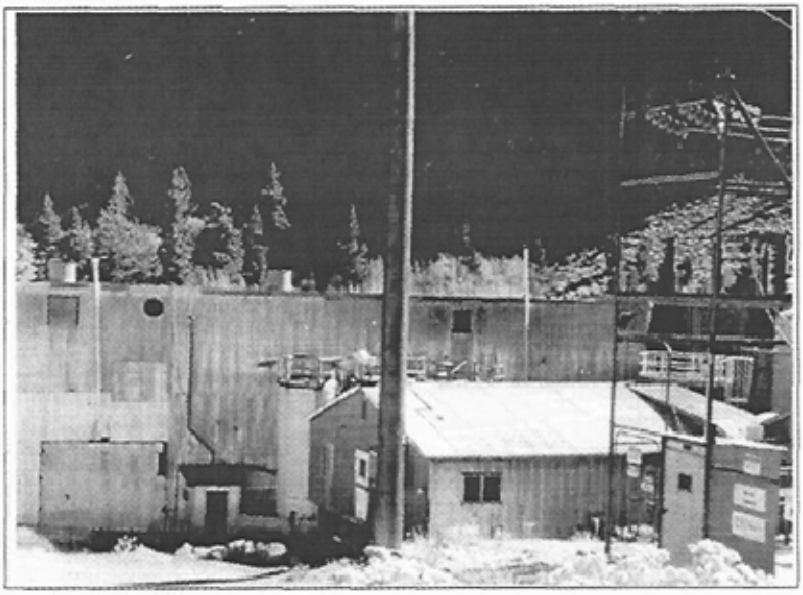
Other Listings
Review Code
Reviewer
Date

Page 1 of 2
*Resource Name or #: ASM-1

P1. Other Identifier: Pine Creek Tungsten Mine Mill
***P2. Location:** ☒ Not for Publication ☐ Unrestricted
***a. County:** Inyo
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Mt. Tom, CA **Date:** 1994 **T** 7S; **R** 30E; NW ¼ of NE ¼ of Sec 8; M.D. B.M.
c. Address: City: Zip:
d. UTM: Zone: 11; 349283 mE/ 4136162 mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate): From the junction of US-395 and US-6 in Bishop, California, drive west on US-395 for 9.66 miles. Turn left (west) onto Pine Creek Road and drive for 10.24 miles, passing through the town of Rovona and into Pine Creek canyon. The road ends at the Pine Creek Tungsten Mine mill. Cross the bridge into the mill complex and turn right (west) onto a maintained drive. The pole is located about 100 meters down the road, on the left (south) side directly in front of the Morgan Sub-station.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) This is the site of the Pine Creek Tungsten Mine mill, located in Pine Creek Canyon at the confluence of Morgan Creek and Pine Creek. The area is covered with fill and has been heavily impacted by construction and long-term mining activities. At present, the mill complex contains a variety of structures and mining/milling equipment including ore cars, heavy machinery, and tools. Although the mine was established circa 1916, the current mill was not constructed until about 1941. It was operated continuously until 1990, over which time several alterations, additions, and impacts to the original structures and landscape occurred. The mill saw a slight resurgence in use during the 1990s but closed again in 2000. Currently, the mine and mill are inactive, and there are no obvious and strictly historic-era buildings, features, or artifact deposits within the site area.

***P3b. Resource Attributes:** (List attributes and codes) AH6- Water Conveyance Systems, AH7- Roads, AH9- Mines/Tailings, AH10- Machinery, AH15- Standing Structures, AH16- Tramway
***P4. Resources Present:** ☐Building ☐Structure ☐Object ☒Site ☐District ☐Element of District ☐Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) 006: Overview of the project area showing the nearby mill structures. View to 130°. 11/6/09.
***P6. Date Constructed/Age and Sources:** Historic ☐Prehistoric ☐Both
***P7. Owner and Address:** Pine Creek Development LLC 9050 Pine Creek Road Bishop, CA 13514
***P8. Recorded by:** (Name, affiliation, and address) K. Manske and J. Larson ASM Affiliates, Inc. 121 California Ave. Reno, NV 89509
***P9. Date Recorded:** 11/6/09
***P10. Survey Type:** Intensive Pedestrian Survey with 15-meter spacing
***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") 2009, Manske and Giambastiani, Class III Cultural Resources Inventory Of Two Utility Poles On The Southern California Edison/ Control-Morgan 55 Kv Line, Inyo County, California

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

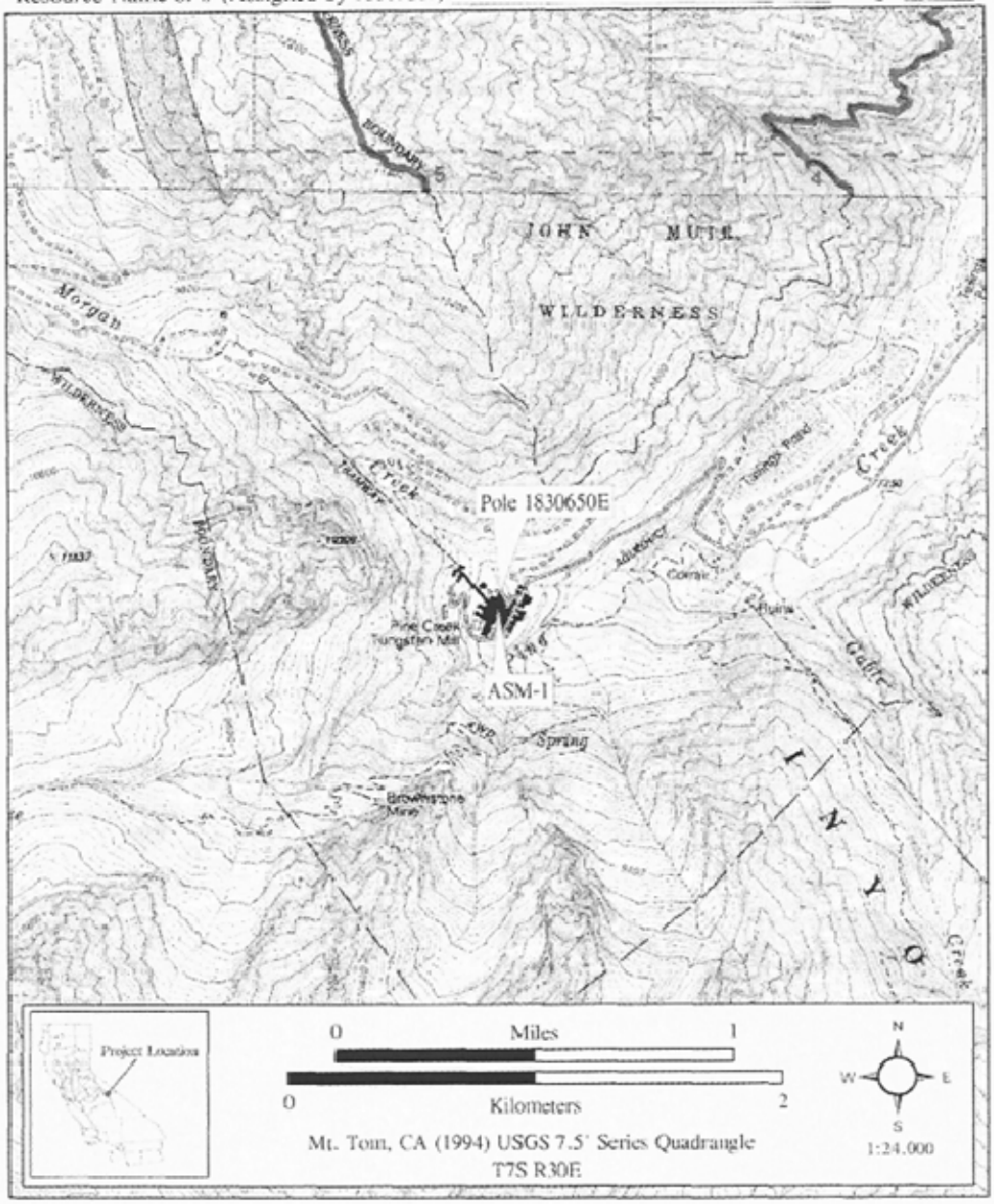
DPR 523A (1/95) *Required information

14-10312

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SITE LOCATION MAP

Primary # _____
HRI# _____
Trinomial _____

Resource Name or # (Assigned by recorder) ASM-1



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 14-10312
HRI # _____
Trinomial _____
NRHP Status Code 3S
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Pine Creek Tungsten Mine

P1. Other Identifier: Pine Creek Mine

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Inyo

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Mt. Tom **Date** 1951 **T** 7S; **R** 30E; __ ¼ **of Sec** 5,6,8; MDM **B.M.**

c. Address _____ City Bishop Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Mt.Tom Quad, T6S, R30E and T7S, R30E Sections 5, 6, & 8. Elevation between 7,800 ft and 11,600 ft, Inyo National Forest.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Pine Creek Mine was first established in 1916 at an elevation of 11,600 feet. The sites associated with the early history of Pine Creek Mine have been demolished. These included buildings and structures near Lake Morgan. Most of the Aerial Tramway except three lower towers, visible from the mill site, have also been demolished. Additionally, the upper adits have been sealed (See APE map attached to HRIER and **Figure 15**) (Belec Interview, August 12, 2014). The site recorded on this DPR form dates between 1941 and 2005 and includes existing improvements consisting of mine buildings, roads and bridges, ponds, utility poles and substations located at the old mill site and Easy Go adit (**Photograph 1; Site Map and List**). (See Continuation Sheet.)

***P3b. Resource Attributes:** (List attributes and codes) HP8 (Industrial Building); HP9(Public Utility Bldg)

***P4. Resources Present:** ☒ Building ☒ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #)

Photograph 1. Facing East, August 12, 2014

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1941-2005 (Jeff Francis, "List of Existing Improvements," 2013)

***P7. Owner and Address:**
Pine Creek Mine, LLC
9050 Pine Creek Road
Bishop, CA 93514

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert & Leslie Trew
JRP Historical Consulting, LLC
2850 Spafford Street
Davis, CA 95618

***P9. Date Recorded:** August 12-13, 2014

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, "Cultural Resources Inventory and Evaluation Report for Pine Creek Mine Hydroelectric Project (FERC Project No. 12532) Inyo County, California," April 2015.

***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

***NRHP Status Code** 3S

***Resource Name or #** (Assigned by recorder) Pine Creek Tungsten Mine

B1. Historic Name: Pine Creek Tungsten Mine

B2. Common Name: Pine Creek Mine

B3. Original Use: Mine B4. Present Use: Inactive Mine

***B5. Architectural Style:** Industrial

***B6. Construction History:** (Construction date, alteration, and date of alterations) ____

For construction dates of existing improvements please refer to Figure 14. Building 11 (Residential/Former Infirmary) was moved ca. 1960 to its current location from where Building 15 (Maintenance Building) is located. Most demolition was done ca. 2000.

***B7. Moved?** ☐ No ☒ Yes ☐ Unknown **Date:** _____ **Original Location:** _____

***B8. Related Features:** _____

B9. Architect: ____ b. Builder: Pine Creek Mine

***B10. Significance: Theme** Tungsten Mining **Area** Invention and Science

Period of Significance 1959-1960 **Property Type** Mine **Applicable Criteria** A & B

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Pine Creek Tungsten Mine might be considered significant under National Register of Historic Places (NRHP) Criterion A and B and the California Register of Historical Resources (CRHR) Criterion 1 and 2, but lacks sufficient integrity to portray its significance under these criteria. Therefore, it does not meet the standards for listing in either the NRHP or CRHR, nor is it an historical resource for the purposes of the California Environmental Quality Act (CEQA). Additionally, Building No. 12, the Metals Lab, is the only remaining building importantly associated with the mine's significance. This building is individually eligible for listing in the NRHP under Criteria A and B and the CRHR under Criteria 1 and 2, and retains sufficient integrity to its period of significance. Therefore, it would be considered an historical resource for the purposes of CEQA. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. (See Continuations Sheet.)

B11. Additional Resource Attributes: (List attributes and codes) HP11 (Engineering Structure); HP18 (Train); HP19 (Bridge); HP20 (Canal/Aqueduct); HP37 (Highways/Trail)

***B12. References:**

Bateman, Paul C.
1945 *Pine Creek and Adamson Tungsten Mines, Inyo County, California, May 1945.* U.S. Geological Survey, Washington D.C.

Brown, Frances
1991 George Brown: A Man of the People. October, *The Album*, October. Accessed 15 November 2011 at http://www.owensvalleyhistory.com/george_brown/page67.html

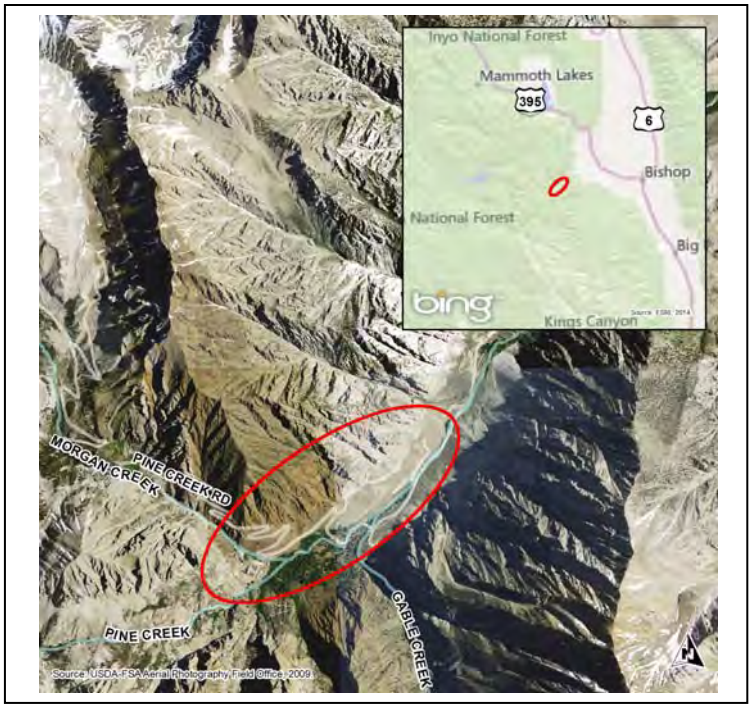
See continuation sheet.

B13. Remarks:

***B14. Evaluator:** Leslie Ann Trew

***Date of Evaluation:** August 18, 2014

(This space reserved for official comments.)



P3a. Description (continued):

No. A – Main Portal Easy Go

The Easy Go Adit is a mine portal constructed in 1970 extending approximately two miles into the mountain. At the entrance is a locked metal gate closing off the mine. Water pipes come out of the mine carrying water that runs into the ponds and down into Morgan Creek. An arched corrugated metal structure covers the entrance to the mine and once completely enclosed the train tracks that run from the mine into the crusher building. The metal enclosure was partially destroyed by an avalanche ca. 2001, and the damaged portion was removed shortly after (**Photograph 4**).

No. B – Maintenance Portal, Easy Go

The Easy Go Maintenance Portal, constructed in 1970, is to the west of the Main Adit. It is a smaller tunnel into the mountain with a locked metal gate closing off the entrance to the mine. A cross braced metal structure shelters the entrance and train tracks extending from the mine portal. The structure is covered with scraps of corrugated metal sheeting. The mine tunnel appears to be braced by wood beyond the gate (**Photograph 5**).

No. C – Brownstone Portal

The Brownstone Portal, constructed in 1974, is west of the Easy Go Adit and Maintenance Portal. There are two tunnels going into the mountain, one is the adit and the other is the Powder Magazine. The Powder Magazine has a metal door closing off the area. There is a slatted metal vent between the door and a round metal pipe. The Brownstone Adit is blocked by a locked chain link fence and gate. This tunnel does not have any bracing on the interior (**Photograph 6**).

No. 1 – Bit Sharpener Building

The Bit Sharpener Building, constructed in 1970, has an L shaped footprint and a concrete slab foundation. It is a manufactured building with a cross gabled roof covered with corrugated metal sheeting and little or no eave. On the north side of the building is a large opening for vehicles and a single entry door with a small glass window. The windows are multi-paned industrial windows, and some have broken or missing panes. There is another single entry door on the south side, and the building is clad in corrugated metal siding. It is connected to the covered mine train tracks going into the crusher building (**Photograph 7**).

No. 2 – Mine Engineering Building

The Mine Engineering Building, constructed in 1970, has a generally rectangular footprint with the main section of the building covered by a gable roof. It has a concrete foundation. The west end has a two-story smooth concrete attachment with a corrugated metal gable roof at the northwest and a one-story shed roof addition to the southwest with a roll up garage door. The building is clad in metal siding with some galvanized Kaiser Steel on the edges. The windows are two-part hinged with metal sash. On the south side, there are two entrances on the first floor, and one entrance on the second floor with a small landing and stairs going to the ground. The stairway has an open railing with round metal handrails. A cantilevered metal awning covers the stoop of the two first floor entrances (**Photograph 8**). On the north side, there are two groups of evenly spaced windows (**Photograph 12**). The east side has irregular roofline covered with corrugated metal. There are louvered vents at the top of two sections and a window opening on the northwest side. There is a covered area attached to the southeast corner of the building (**Photograph 9**).

No. 3 – Crusher/Dumper Building

The Crusher/Dumper Building, built in 1970, is an irregular shape and built into the side of the mountain with a concrete foundation (**Photograph 10**). The train tracks covered by a sheltered metal structure lead to the ore dump and extend past the dump station about the length of ten ore cars to allow movement of emptied cars. The sections of track covered by the arched shelter are supported by steel cross bracing. The building steps down the mountain side. The building has five gable roof sections covered by corrugated metal. The building is clad in corrugated metal sheeting. There are long rectangular window openings covered with fiberglass sheets. There are two single entry doors on the west side, and one on the south side. The crusher building has a section that extends to a clarification tank on the east side (**Photograph 11**). There is a

single entry door covered by a metal awning facing south and two large metal pipes coming out of this section connecting to the tank.

No. 4 – Carpenter Building/Warehouse

The Carpenter Building/Warehouse, constructed in 1970, is a Butler building attached to the covered train tracks going into Building No. 3 (**Photograph 12**). It has a generally rectangular footprint covered by a gable roof. There is an addition to the west side of the building with a shed roof. The building has a concrete foundation, and is clad in corrugated metal siding. There are two single entry doors on the north side, two barn door entrances, and a third large entrance with no door. There are three windows on the north side that are two part with aluminum sash. On the west side, there is a barn door entrance next to a two-story circular tank with a ladder and concrete containment wall. On the south side, there are six two-part aluminum sash windows with bars on the interior (**Photograph 13**).

No. 5 – Locomotive/Substation Building

Locomotive and Substation Building, constructed in 1970, has a rectangular footprint. It is a tall one-story building on a concrete slab. It has a low pitched salt box roof covered with metal. The building is clad in corrugated metal sheeting. Part of the sheeting is missing on the north side exposing the iron structure beams (**Photograph 14**). There are two large vehicle sized openings, one each on the east and west sides. The compressor tank and several pipes coming out of the building are on the northeast corner. At the north side of the building is located a service crane (see below, E4). On the south side is a substation with transformers, wooden electrical poles, and wire (**Photograph 15**).

No. 6 – Ore Bin with Elevator Round

Ore Bin with elevator, constructed in 1970, is a round building with a conical roof and concrete base. It is approximately seven stories high and has an exterior elevator shaft enclosed with corrugated metal sheeting (**Photograph 17**). The second-story is clad is corrugated metal, while the upper portion is smooth steel with exterior bracing. There is a grated metal walkway and machinery on the roof (**Photograph 16**). This ore bin was once connected directly to Building 3 (Crusher) and now stands alone.

No. 7 – Clarifier, Roofless Tank

The clarifier tank, constructed in 1970, is connected to the Crusher building. It is a large round tank with an open top (**Photograph 11**). There are several chambers within the tank. It would spin to separate rock particles from water coming from the mine before it was discharged into the creek.

No. 8 – Electrical Substation, SCE

The Electrical Substation, constructed in 1984, is primarily a steel structure supporting electrical equipment used in the transmission of power. It sits on top of a concrete pas and is surrounded by a chain link fence. There are wooden electrical poles supporting elevated electric cable lines (**Photograph 19**).

No. 9a – Avalanche Warehouse

The Avalanche Warehouse, constructed in 1970, has a square footprint and a concrete foundation. It is a tall one-story building with a shed roof covered with corrugated metal sheeting. The building has a steel frame clad in corrugated metal sheeting. On the north side, there is a small fixed six-pane window (**Photograph 20**). There is a concrete ramp leading to a vehicle entrance and a single entry metal door with a fixed single pane window adjacent to the vehicle entrance on the south side. Both are covered by a steel framed metal awning. There is another oversized entrance on the west side. The building is attached to No. 9b on the east side (**Photograph 21**).

No. 9b – Old Warehouse

The Old Warehouse, constructed in 1941, has a rectangular footprint and a shed roof with exposed rafter ends. It is a wood frame structure clad in corrugated metal sheeting. On the south side, there is a vehicle entrance with a roll up door and five replacement windows that are two-part vertical windows with plywood to the east covering the remaining opening of the old

window space. There is single entrance door opening to a small wood platform with four stairs. On the east side, there are two windows and a single entry wood door. One window is a two-sash horizontal sliding replacement window. The other window is six-light, two sash wooden frame that slides horizontally (**Photograph 21**). There is an addition to the north side with a shed roof that has a slight overhanging eave. There is a metal entry door with a fixed pane on the east side. On the north, there are two six-light fixed windows and a large opening approximately 12 feet across adjacent to a single entry door (**Photograph 20**).

No. 10 – Residential/Former Office

The Residential/Former Office building, constructed in 1941, has a primarily rectangular footprint with a section extending on the west side (**Photograph 23**). The roof is slightly pitched shed with wide eaves and exposed rafters. The building is two story clad in horizontal shiplap on the second-story and vertical board on the first-story. The windows are double-pane two-sash replacements with faux muntins. There are windows wrapping around the first and second stories southwest corner. A concrete stair and stoop lead to a single entry door with eight-light window covered by a cantilevered awning on the west side (**Photograph 22**). On the southwest side, there is a deck enclosed with chain link fence adjacent to utility equipment covered by a shed roof and also enclosed by chain link fence. The north side of the building is against the hillside. On this side, the second story has several groupings of double-pane replacement windows with hinged windows above. There are two entry doors with full length glass opening to a concrete patio (**Photograph 24**). The building is attached to No. 11 by an enclosed hallway with a two part gable roof covered with corrugated metal sheeting. There is a single entrance door on the west and east sides of the hallway (**Photograph 25**).

No. 11 – Residential/Former Infirmary

The Residential/Former Infirmary building, constructed in 1941, has a rectangular footprint, and slight pitched shed roof with wide eaves and exposed rafters except on the north where they are boxed. The building is two story clad in horizontal shiplap on the second-story and vertical board on the first-story. The windows are double-pane two-sash replacement with faux muntins. On the south side, there is a raised deck on the second-story with metal railings and steel staircase (**Photograph 22**). There are two garage doors on the east side. On the north side, there is a two-sash horizontal sliding window adjacent to a cantilevered awning indicating an entry door was removed (**Photograph 25**). It was moved to this location ca. 1960s (Interview, Belec and Haeinni).

No. 12 – Metals Lab

The Metals Lab, constructed in 1941, has a rectangular footprint and a steeply pitched gable roof with a slight eave. An addition on the north has a hipped roof with exposed rafter ends and is covered by corrugated metal sheeting. The building is clad in corrugated metal sheeting. On the south side, there are two 9-light fixed pane windows, a single entry door, and an oversized roll-up door. On the west side, there is another 9-light fixed pane window and a 6-light fixed pane window (**Photograph 26**). The addition has a single entry door with fixed glass and a two-sash horizontal sliding window. The north side has five smaller two-sash windows, and on the east side, there is a two-sash horizontal sliding window. Adjacent to the building is a concrete support for a penstock (**Photograph 27**).

No. 13 – Exempt Hydro P-13163

Exempt Hydro Building, constructed in 1980-82 (Interview, Belec and Haeinni), has a rectangular footprint and a salt box roof. The building is steel framed and clad in metal sheeting. There is a single entrance door on both the north and south sides. Two penstocks from the mine run into the building on the north. There is a valve next to the buildings northwest corner (**Photograph 28**). A steel grated walking bridge passes on the south side and goes around the east side to the adjacent buildings entrance (**Photograph 29**). The adjacent building is similar in size and material. It has a rectangular footprint and salt box roof. The building is clad in steel sheeting and has a single entry door on the south side.

No. 14 – Mine Water Discharge – Surge Chamber

No. 14 is directly north and adjacent to the Metals Lab. It is a steel surge chamber partially buried in the ground (**Photograph 30**), and was installed in 2005.

No. 15 - Maintenance Building, New

The Maintenance Building is a tall rectangular Butler building with a slightly pitched gable roof. It has four oversized roll-up doors and a single entry door on the north side. There is a shed roof covering and office area on the buildings northeast corner. On the west side, there is a small gable roof shed with a sliding barn door. Both buildings are clad in corrugated metal sheeting. There is an oversized opening sealed with multiple kinds of material including metal and fiberglass sheeting and a newer window with multiple panes (**Photograph 31**). It sits on the location of Building 11 prior to its move.

No. 16 – Front Entrance Bridge

The front entrance bridge is a "pre-assembled steel" bridge approximately 100 feet long by 15 feet wide spanning the distance over Morgan Creek between Morgan Creek Road and Pine Creek Road. The bridge has metal grating on I-beams with cross members. Rebar is set at an angle across the decking for traction, and railings are welded steel canted outward (**Photograph 33**).

No. 17 – Easy Go Access Road

Easy Go Access Road, built in 1960, goes from the lower mill site to the upper area where the Easy Go adit and structures are located. It is a gravel road approximately 10 to 15 feet across. There is pressure treated wood cribbing along the mountain to hold back falling rock (**Photograph 16**).

No. 18 – Morgan Creek Road

No. 18 or Morgan Creek Road, built in 1939, is located across from the mill site on the other side of Morgan Creek. It is a gravel road that switches back and forth up the steep mountain side (**Photograph 37**). This road continues approximately 17 miles up to the upper mine portals, which are sealed, and Morgan Lake. There is pressure treated wood cribbing along the mountain acting as retaining walls. Access to this road by vehicles is currently prohibited by the Forest Service.

No. 19 – Tramway Towers, multiple

There are three tramway towers remaining of the 15 that were originally constructed in 1941. The towers are of varying heights. As originally described, they were between 27 and 120 feet high. They are large wooden crossed braced A-frame structures (**Photograph 4**).

No. P0 – Mine Water Discharge Pipe

No. P0 is the discharge pipe, installed in 1970, that carries water from the mine to P1. It comes out of the Easy Go Adit and goes under ground to a junction between the portal and the Bit Sharpener Building. It then goes around the Bit Sharpener Building to discharge into Pond P1.

No. P1, P2, P3, P4, P5, P6 – Mine Water Discharge Ponds

There are six ponds built in 2005 that the mine water flows through on the property. Pond 1 or P1 is located closest to Building No. 6. Mine water discharges directly into this first pond (**Photograph 18**). The water then flows down the mountain into P2, followed by P3, P4, P5, and finally into P6, which flows into the creek (**Photograph 26**). These ponds have pipes going between them under the roads. They are stocked with fish by the property owner's staff.

No. E1 – Ore Cars

Directly south of the Locomotive/Substation Building, there are four ore cars loaded with the last ore mined from Pine Creek. The ore cars are steel buckets with locking mechanisms on the front and back. The cars are moved via the locomotive tracks (**Photograph 15**).

No. E2 – Locomotive Railway Line

Railway tracks emerge from the Easy Go and Maintenance Portals and run between the buildings going to the Locomotive/Substation building and into the Crusher Building (**Photograph 12**). The Railway line is covered in some areas

by Quonset metal sheeting structures. The Quonset once extended continuously from the Easy Go Adit to the Crusher Building (**Photograph 4**).

No. E3 – Ore Cars & Locomotives

Seven empty Ore Cars and two locomotives remain inside the Quonset of the Crusher Building (**Photograph 36**).

No. E4 – Crane, Maintenance

The Crane is located slightly north of the Locomotive building, and was constructed in 1970. It is a large steel structure with two I-beams at a 45 degree angle and cables with pulleys (**Photograph 15**).

No. E5 – Mine Compressor

The Mine Compressor is a steel tank located by the northeast corner of the Locomotive/Substation Building (**Photograph 15**). It was installed in 1970.

No. E6 – Power Poles & Lines

There are several wooden power poles with cables on the property running between the two power substations (**Photograph 15** and **Photograph 19**).

Tailing Ponds

The tailing ponds are located east of the mill site, and were the dumping ground for mine waste. They were constructed in 1941 (Kurtak 1998: 142). There are four total tailing ponds that extend east toward Rovana on the north side of the Creek (**Photograph 34**).

Aqueduct and Ditch

There is an earthen aqueduct going from Pine Creek leading down into a metal pipe that can be seen behind the Maintenance Building and along Morgan Creek Road after passing through the mine's gate. It was used to control storm water (**Photograph 32** and **Photograph 35**).

B10. Significance (continued):

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 3400º 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 claim 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] WO_2 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 Inyo 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 daily 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 daily 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. 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 1). 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).

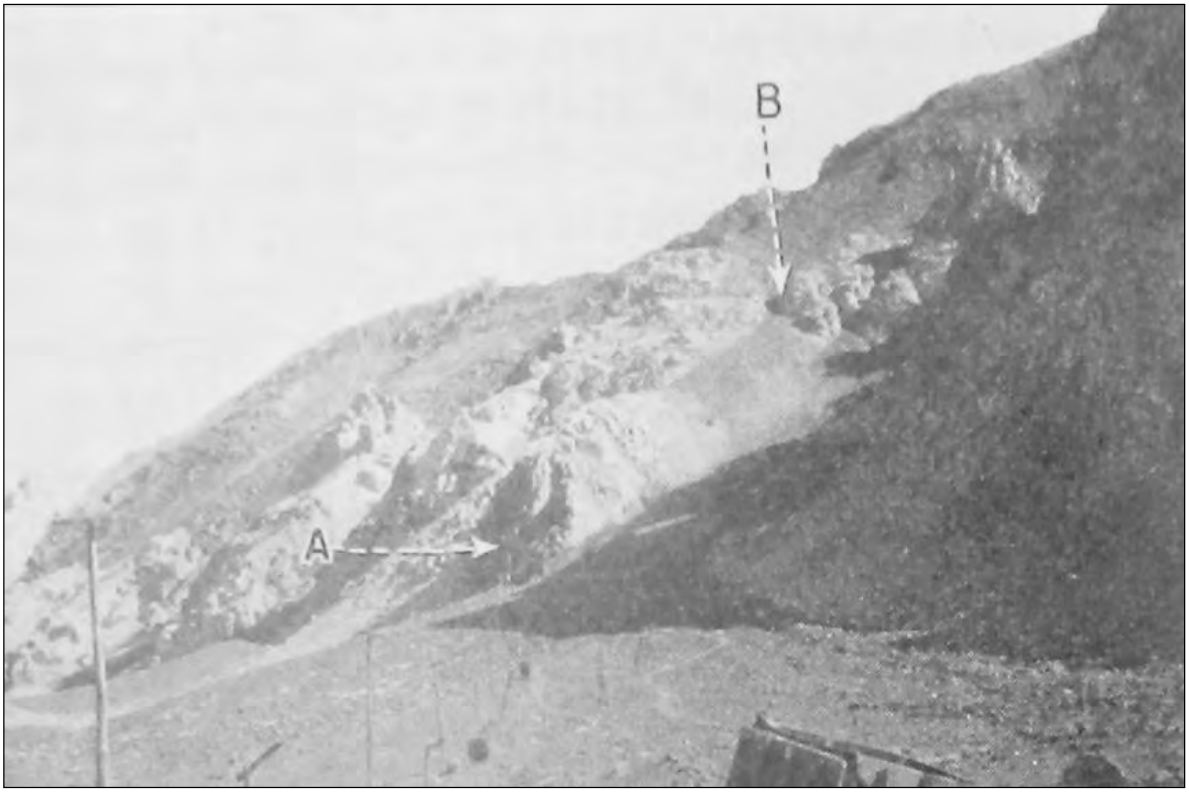


Figure 1. Outcrop of Tungsten deposit, showing upper and lower adits at B and A (Photograph from *Engineering and Mining Journal*, 10 April 1926:606).

For a 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 Indian, 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 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 (DOI, BM 1938:568-570, 572).

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 WO_3) 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." They operated a mill with a 350 or 500 ton daily capacity at Pine Creek, and were constructing a mill with 1,200 to 1,300 ton daily 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 (See Figure 2) (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 5½ ft. short-head crusher set to a ¼ 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 2. 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).

Korean War and Government Stockpile Program (1950 – 1958)

In June of 1950, North Korea invaded South Korea because of a dispute over the boundary set 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 lbs), 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).

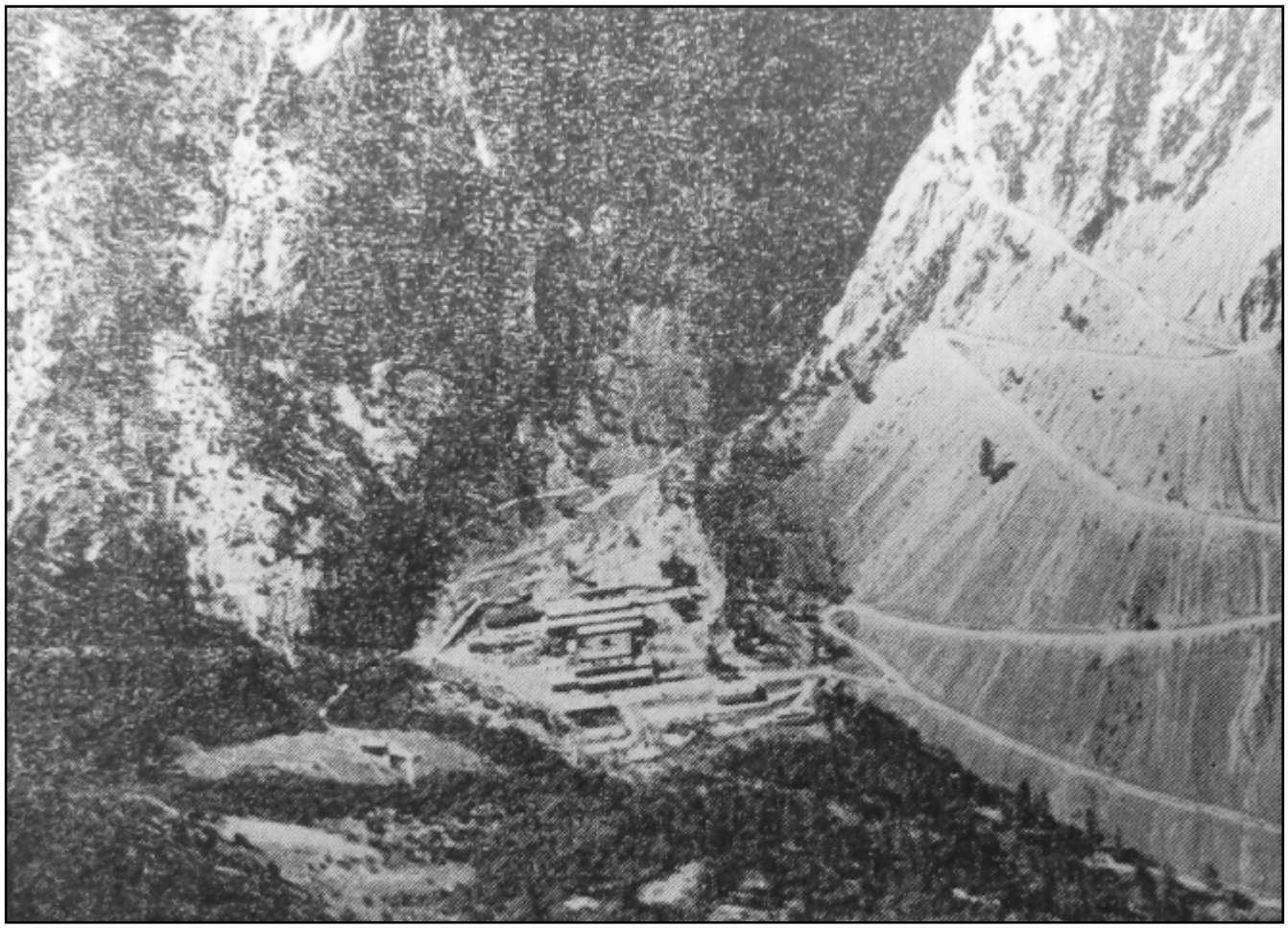


Figure 3. Largest US Producer of tungsten, United States Vanadium Co's Pine Creek mine, Bishop Calif., is expanding production to meet defense demands. Mill appears above, road leads up to Zero Tunnel, at 9,300 ft. elevation (Photograph from *Engineering and Mining Journal*, May 1951: 76).

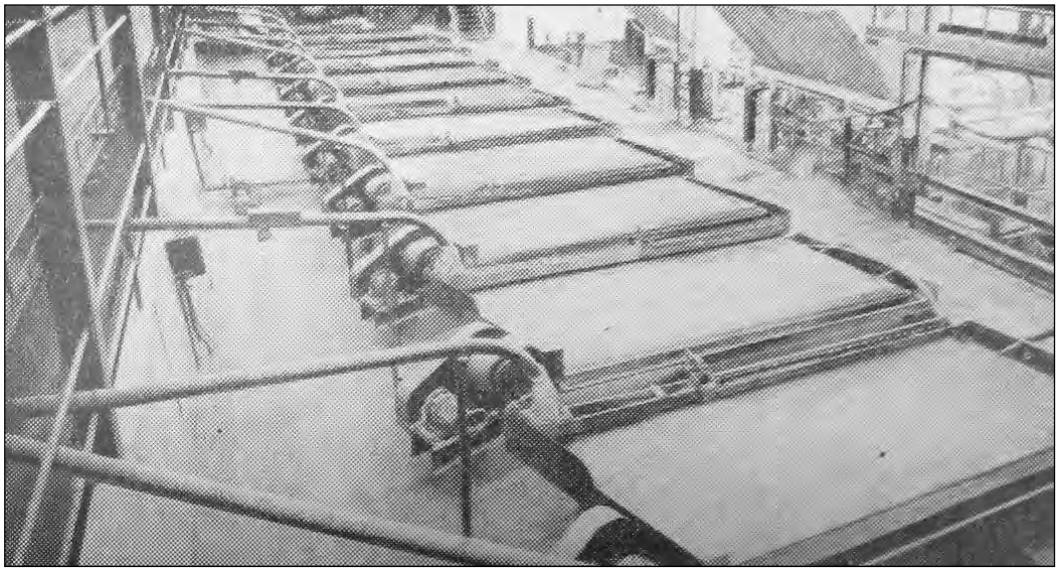


Figure 4. Tables separate coarse scheelite for regrinding, and make high-grade concentrate for shipment at Pine Creek (Photograph from *Engineering and Mining Journal*, May 1951:83.)

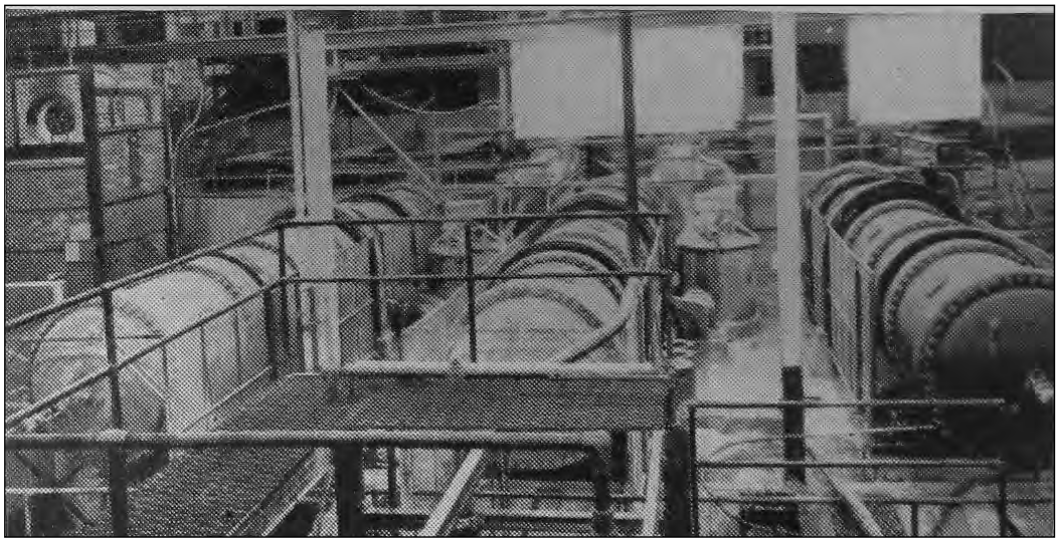


Figure 5. Chemical Plant at Pine Creek makes pure tungsten and molybdenum products from concentrates. These are pressure digesters (Photograph from *Engineering and Mining Journal*, May 1951:83.)

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 6).

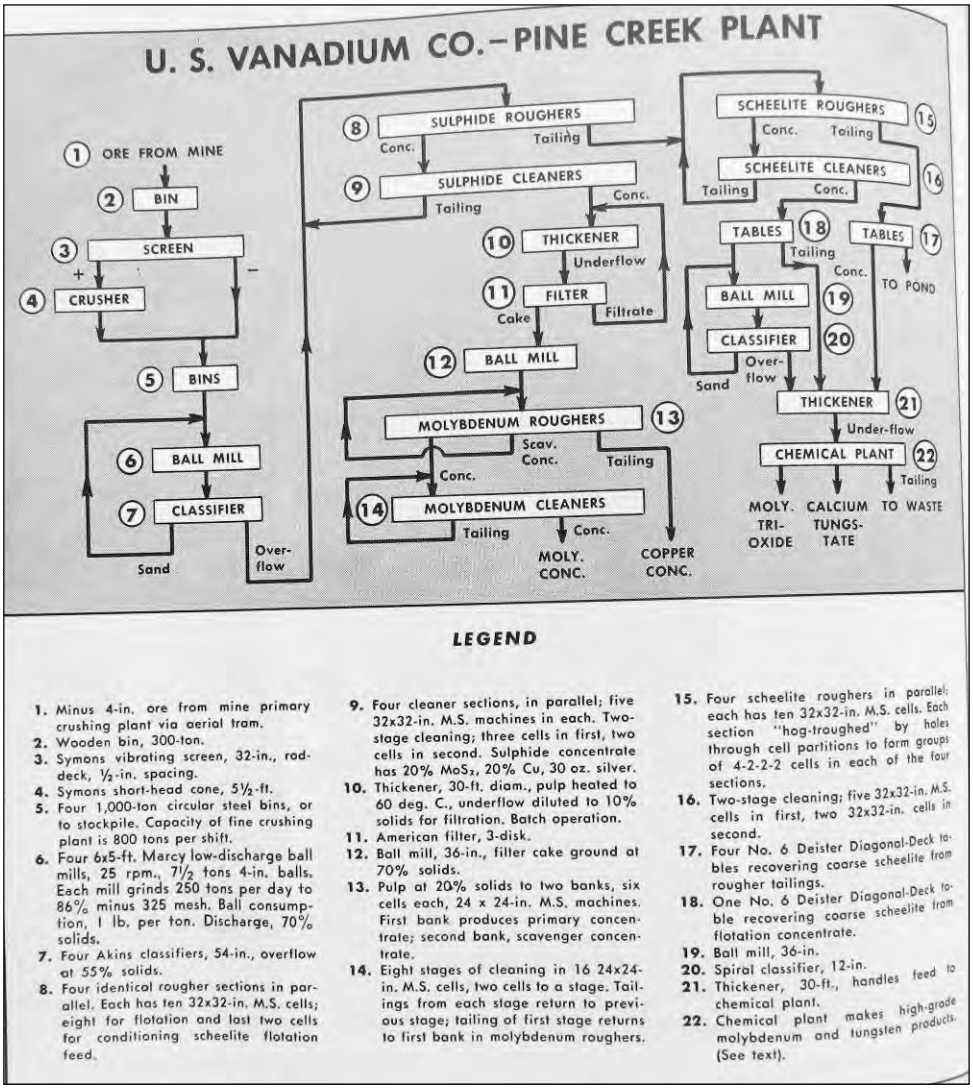


Figure 6. Mill flowsheet from *Engineering and Mining Journal*, May 1951:82.

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 the "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).

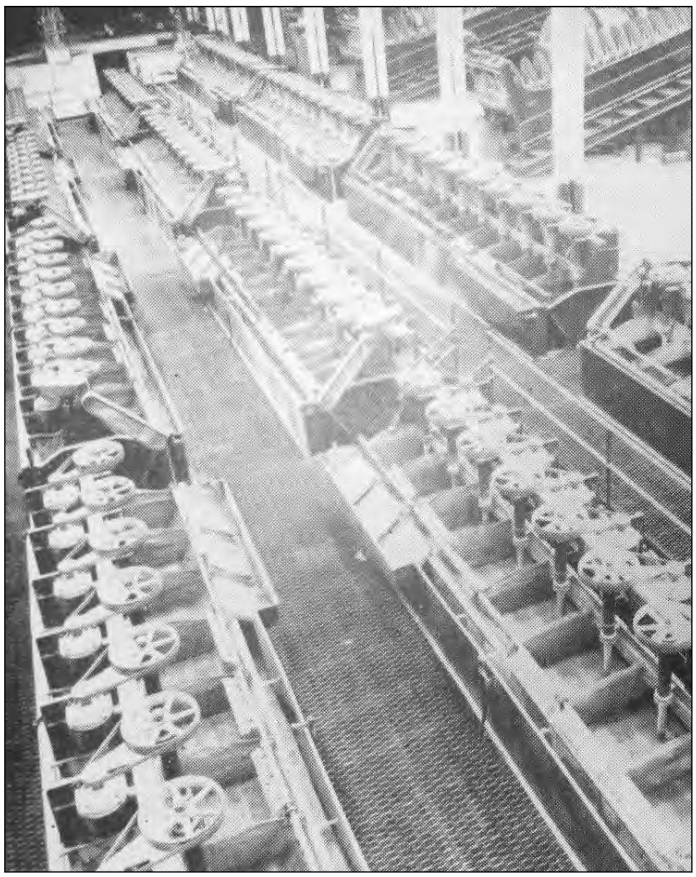


Figure 7. Flotation Section at Pine Creek uses M.S. machines, makes copper, molybdenum, and scheelite concentrate (Photograph from *Engineering and Mining Journal*, May 1951:83.)

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, for a 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 8), 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).

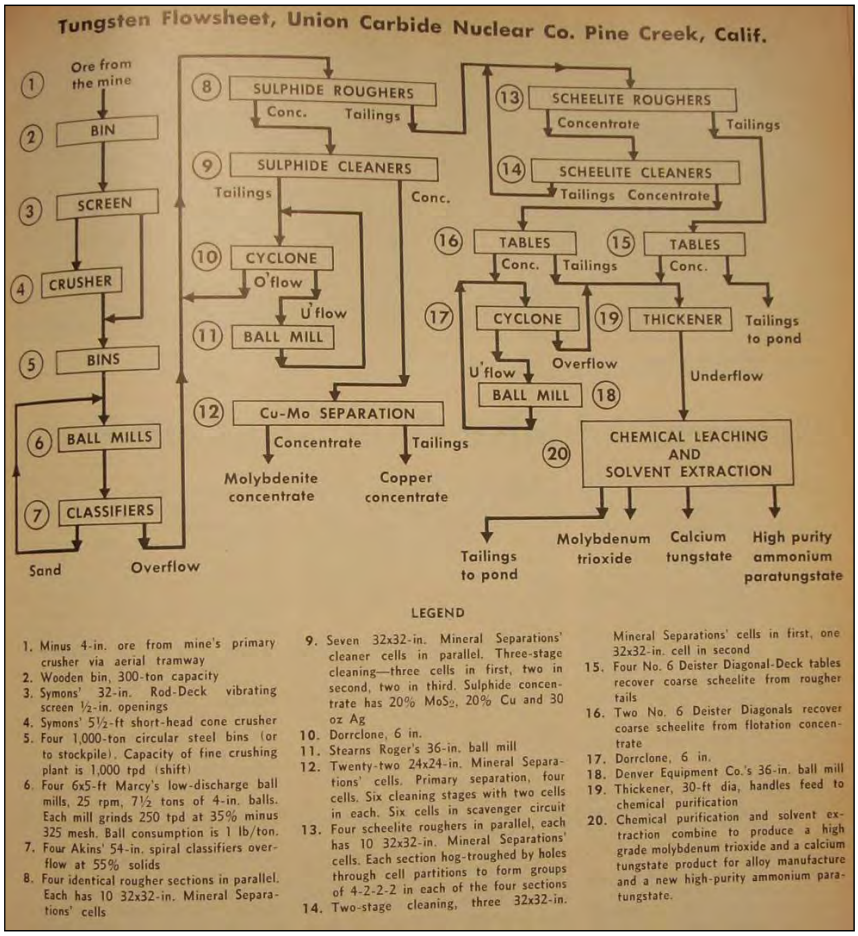


Figure 8. Mill flowsheet from *Engineering and Mining Journal*, October 1959:103.

Ore grades dropped as the mine's resources 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 the 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).

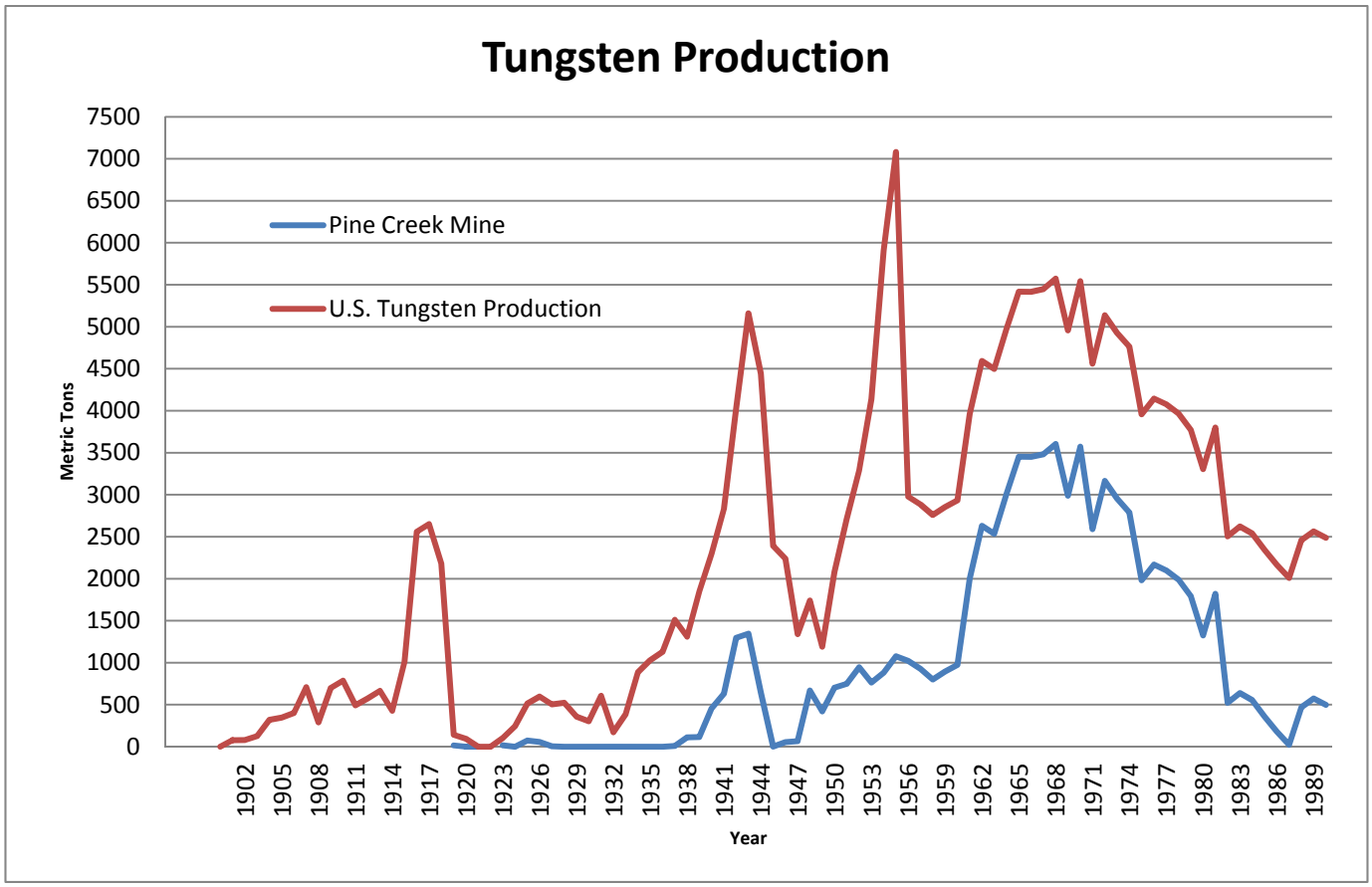


Figure 9. Tungsten Production (Kurtak 1998:198-1999; USGS 2012). USGS provided information for Tungsten production in the United States in two categories "Primary Production" and "Secondary Production," which were added together to create a total production number used for this table. Pine Creek Mine production information furnished by Kurtak was listed in Units of WO_3, which was converted into metric tons for use in this table.

Figure 10. Pine Creek Mill Site at junction of Pine and Morgan Creeks ca. 1959 (Photograph provided by Pine Creek Mine LLC).

Figure 11. Pine Creek Mine facing northwest (Photograph provided by Brian Schmalz May 27, 2012, http://calitrails.files.wordpress.com/2012/05/pinecreek-mine.jpg). The Easy Go adit is near the crusher building (built 1970) in the center of this image.

Evaluation

Taken as a complex, the Pine Creek Tungsten Mine has significance under Criteria A and B, but lacks sufficient integrity to meet the criteria for listing in the National Register of Historic Places. One building, however, the mine's Building No. 12, Metals Lab, appears to meet the criteria for listing in the National Register and California Register under Criteria A and 1, and B and 2, as explained below.

Application of National Register / California Register Criteria

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 first direct process for creating ammonium paratungstate (APT), which created marketable tungsten products out of low grade concentrates and increased the available ore. 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 demand generated by 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 *Engineering and Mining Journal* 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 the development of this process that imbues Building No. 12 with its historical significance.

This property, nor any of its individual elements, is not 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 the mine site are simple, modern industrial buildings, often of a "Butler" type, quickly assembled, and primarily made 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.

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.

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.

Integrity

Integrity is the ability of a property to convey its historic significance, in the case of mining properties National Park Register *Bulletin 42* states,

> the passage of time, exposure to a harsh environment, abandonment, vandalism, and neglect often combine to cause the deterioration of individual mining property components…However, the property may still exhibit a labyrinth of paths, roads, shaft openings, trash heaps, and fragments of industrial activity like standing head frames and large tailings piles. Although these individual components may

> appear to lack distinction, the combined impact of these separate components may enable the property to convey the collective image of a historically significant mining operation. In essence, the whole of this property will be greater than the sum of its parts (NPS: 19).

Pine Creek retains integrity of location and association, because it remains in its original location and retains its association with mining. It does not, however, evoke the feeling of an active mining property.

Mine and mill sites experience evolution of development over the course of their active lifespan, and mining "plants found in an unaltered state are rare.," noted the NPS. "Thus, contemporary evaluation of a mill's integrity should not only be based on its conformance with an original construction plan, but also on its ability to illustrate the property's evolution through time" (NPS: 20). Pine Creek's original mill site and housing quarters have all been demolished. In some cases, sites were destroyed by avalanches, but all upper mining and milling structures have been completely removed in anticipation of an environmental restoration plan. As the mine evolved, it moved down the mountain to lower elevations to operate its milling equipment at safer places with easier access. The tramway towers and the Easy Go Adit are illustrations of this development and evolution at Pine Creek. As the NPS states, "Mining operations were designed to follow established mine engineering practices that involved the flow of ore from the mine to the mill to the refinery. The engineering flow chart is essential in understanding integrity of design" (NPS: 20). Reviewing the mining flow chart established in 1959, after the implementation of the APT process, reveals integral parts of the mining process that are no longer reflected at Pine Creek because of demolition of the mill and other important processing facilities. All the equipment and buildings that housed the parts of the process discussed in the flow chart between stages 6 and 20 are no longer evident at Pine Creek Mine (see **Figure 8**). The location of the mill is only evident by the grading of the earth (see **Photograph 18**). Pine Creek does not have integrity of design, because of the loss of the mill building and equipment as illustrated by the flow sheet and by an undated property map. The only remaining building importantly associated with the APT process is Building No. 12, the Metals Lab (see **Figure 15**; **Table 2**; **Table 1**).

Pine Creek Mine also has slightly diminished integrity of setting, because of the addition of ponds. These were added in 2005 after the mine shut down, and are not associated with the mine's historic significance (see **Figure 14**). They slightly diminish the industrial feeling of the mine site as well.

National Park Service *Bulletin 42* states that to retain "integrity of materials requires evidence that sympathetic materials have been used during the course of previous repair or restoration of mining properties" (NPS: 21). Pine Creek does not retain integrity of materials. It is evident that the extant buildings dating to the original construction period of the mill site have been altered by the replacement and removal of doors and windows. In some cases, window replacements have altered the opening size and shape, as seen on buildings No. 9a and 9b. Windows have also been replaced on buildings No. 10 and No. 11. Doors have been added, removed, and replaced on buildings No. 9a, 9b, 10, and 12 (See **Photograph 21**, **Photograph 22**, **Photograph 25**, and **Photograph 26**). Most buildings that remain were built in 1970 during Pine Creek's peak operational period and outside any logical period of significance (see **Figure 9** and **Figure 14**).

Bulletin 42 concludes that overall integrity "will frequently hinge not so much on the condition of extent buildings, but rather on the degree to which the overall mining system remains intact and visible. ... If clear physical evidence of a complete system remains intact, deterioration of individual aspects of the system may not eliminate the overall integrity of the resource (NPS: 21)." Pine Creek Mine may retain some evidence of an overall mining system as demonstrated by the mill grading and foundations for minor buildings like the Carpenter and Machine shops that were adjacent to No. 9a and 9b (see **Photograph 37**). Pine Creek Mine, as a whole, does not retain sufficient integrity to the period of significance as required for listing in the NRHP or CRHR, because very little remains that conveys the mine's historical significance.

Pine Creek, while a large producer, is not significant as a tungsten mine, because its mining processes were like other subterranean mines. Most remaining improvements do not date to the period of significance (1959-60), and are not individually eligible for listing in the NRHP or CRHR (**Table 1**). Pine Creek's significance lies with the mill and buildings associated with the APT process, of which only Building 12 survives to convey that history.

Extant Improvement	Built Date
A – Main Portal Easy Go	**1970**
B – Easy Go Maintenance Portal	**1970**
C – Brownstone Portal	**1974**
1 – Bit Sharpener Building	**1970**
2 – Mine Engineering Building	**1970**
3 – Crusher/Dumber Building	**1970**
4 – Carpenter Building/Warehouse	**1970**
5 – Locomotive/Substation Building	**1970**
6 – Ore Bin	**1970**
7 – Clarifier Tank	**1970**
8 – Electrical Substation – SCE	**1984**
9a – Avalanche Warehouse	**1970**
13 – Exempt Hydro P-13163	**1980-82**
14 – Mine Water Discharge (Surge Chamber)	**2005**
15 – New Maintenance Building	**Ca. 1970-1980**
16 – Front Entrance Bridge	**2005**
17 – Easy Go Access Road	**1960**
P0 – Mine Water Discharge Pipe	**1970**
P1 – Mine Water Discharge Pond	**2005**
P2 – Mine Water Discharge Pond	**2005**
P3 – Mine Water Discharge Pond	**2005**
P4 – Mine Water Discharge Pond	**2005**
P5 – Mine Water Discharge Pond	**2005**
P6 – Mine Water Discharge Pond	**2005**

Table 1. List of Existing Improvements not associated with period of significance.

Table 2 identifies extant buildings that existed during the period of significance. The method for APT developed in the Metals lab (Building 12) was tested at a pilot plant in Pine Creek Canyon that is now demolished and completely removed. The mill site does not clearly illustrate the significance of the APT process, because nothing remains of the mill building. Buildings 9b, 10 and 11, Morgan Creek Road, tramway towers, and tailing ponds, dating to the period of significance, do not convey the historical significance, therefore they could not be included in a historic district. Additionally, these buildings are not individually elibible for listing in the NRHP or CRHR.

Extant Improvements	Built Date
9b – Old Warehouse	**1941**
10 – Residential/Former Office	**1941**
11 – Residential/Former Infirmary (moved ca. 1960)	**1941**
12 – Metals Lab	**1941**
18 – Morgan Creek Road	**1939**
19 – Tramway Towers	**1941**
Tailing Ponds (1thru 4)	**1941**

Table 2. List of Existing Improvements associated with the period of significance.

Building No. 12, the Metals Lab, retains integrity of location, design, setting, materials, and workmanship despite the addition to the rear and the personal door to the front. These added features do not significantly diminish the building's

integrity. The addition is in the back, and does not protrude above the building or significantly alter its size and massing. The personal door on the south facing side does not significantly alter the appearance of the front of the building. Integrity of setting and association have been affected by the removal of buildings once located at this mine site. However, these changes do not affect the buildings ability to convey its significance (See **Photograph 2**; **Photograph 3**).

Photograph 2. Building 12 – Metals Lab; facing north; August 12, 2014.

Photograph 3. Building 12, taken from Pine Creek mill at Junction of Pine and Morgan Creek Ca. 1959 (Photograph provided by Pine Creek Mine LLC).

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Photographs (continued):

Photograph 4: No. A - Easy Go Adit (built 1970) and Structure 19 – Tramway Towers tramway towers (built1941); facing north, August 12, 2014.

Photographs (continued):

Photograph 5: No. B – Easy Go Maintenance Portal (built 1970); facing northwest, August 12, 2014.

Photograph 6: No. C – Brownstone Adit and Powder Magazine (built 1974); facing west, August 12, 2014.

Photographs (continued):

Photograph 7: No. 1 – Bit Sharpener Building (built 1970); facing south, August 12, 2014.

Photograph 8: No. 2 – Mine Engineering Building (built 1970); facing north, August 12, 2014.

Photographs (continued):

Photograph 9: No. 2 – Mine Engineering Building (built 1970); facing west, August 12, 2014.

Photograph 10: No. 3 – Crusher/Dumper Building (built 1970); facing north, August 12, 2014.

Photographs (continued):

Photograph 11: No. 3 – Crusher/Dumper Building (built 1970) and Building 7, Clarifier Tank (built 1970); facing southwest, August 13, 2014.

Photograph 12: No. 2 – Mine Engineering Building (built 1970), No. 4 – Carpenter/Warehouse Building (built 1970), E2 – Locomotive Railway Line (built 1970); facing east, August 12, 2014.

Photographs (continued):

Photograph 13: No. 4 – Carpenter/Warehouse Building and covered tracks to No. 3 (built 1970); facing north, August 12, 2014.

Photograph 14: No. 5 – Locomotive/Substation Building and No. B – Easy Go Maintenance Portal (built 1970); facing east, August 12, 2014.

Photographs (continued):

Photograph 15: No. 5 – Locomotive/Substation Building (built 1970), E1 - Ore Carts, E4 – Crane (1970), E5 – Mine Compressor (1970), and E6 – Power Pole and Lines; facing west, August 12, 2014.

Photograph 16: No. 6 – Ore Bin with Elevator and No. 3 – Crusher/Dumper Building (built 1970); facing east, August 12, 2014.

Photographs (continued):

Photograph 17: No. 6 – Ore Bin with Elevator (built 1970); facing west, August 12, 2014.

Photographs (continued):

Photograph 18: No. 6 – Ore Bin (built 1970), Pond 1(P1); Pond 3 (P3), Pond 4 (P4) (built 2005), No. 8 – Electrical Substation, No. 9a – Avalanche Warehouse, No. 9b – Old Warehouse, No. 15 – Maintenance Building, No. 12 – Metals Lab, No. 17 – Easy Go Access Road, No. 18 – Morgan Creek Road; facing southeast, August 12, 2014.

Photograph 19: No. 8 – Electrical Substation (built 1984), SCE and No's 9a (built 1970) and 9b (built 1941) behind; facing southwest, August 12, 2014.

Photographs (continued):

Photograph 20: No. 9a – Avalanche Warehouse (built 1970), No. 9b – Old Warehouse (built 1941), Pond 4 (P4) (built 2005); facing east, August 12, 2014.

Photograph 21: No. 9b – Old Warehouse (built 1941), No. 9a – Avalanche Warehouse (built 1970); facing west, August 12, 2014.

Photographs (continued):

Photograph 22: No. 11 – Residential/Former Infirmary (built 1941), No. 10 – Moved Residential/Former Office (built 1941); facing west, August 13, 2014.

Photograph 23: No. 11 – Residential/Former Infirmary (built 1941), No. 10 – Residential/Former Office (built 1941); facing north, August 12, 2014.

Photographs (continued):

Photograph 24: No. 10 – Residential/Former Office (built 1941) and modern Pond 5 (P5) (built 2005); facing southwest, August 13, 2014.

Photograph 25: No. 11 – Residential/Former Infirmary (built 1941) and connecting hallway moved to this site the 1960s; facing southwest, August 13, 2014.

Photographs (continued):

Photograph 26: No. 12 – Metals Lab (built 1941), Pond 5 (P5) and Pond 6 (P6) (built 2005); facing north, August 12, 2014.

Photograph 27: No. 12 – Metals Lab (built 1941); facing south, August 12, 2014.

Photographs (continued):

Photograph 28: No. 13 – Exempt Hydro P-13163 (installed 1980-82) and No. 14 – Mine Water Discharge (Steel Surge Chamber, installed 2005); facing southeast, August 12, 2014.

Photograph 29: No. 13 – Exempt Hydro P-13163(built 1980-82); facing north, August 12, 2014.

Photographs (continued):

Photograph 30: No. 13 – Exempt Hydro P-13163(built 1980-82) and No. 14 – Mine Water Discharge (Steel Surge Chamber, installed 2005); facing east, August 12, 2014.

Photograph 31: No. 15 – New Maintenance Butler Building and storage shed; facing east, August 12, 2014.

Photographs (continued):

Photograph 32: Earthen Drainage Ditch and No. 15- Maintenance Building; facing east, August 13, 2014.

Photograph 33: No. 16 – Front Entrance Bridge (built 2005) and No. 15 – Maintenance Building; facing south, August 12, 2014.

Photographs (continued):

Photograph 34: Tailing Pond 1 (built 1941); facing east, August 13, 2014.

Photograph 35: Storm water drainage and Morgan Creek Road; facing southwest, August 13, 2014.

Photographs (continued):

Photograph 36: Interior of shelter section leading to No. 3 – Crusher/Dumper Building (built 1970); facing north, August 13, 2014.

Photograph 37: No. 18 – Morgan Creek Road (built 1939), switching back and forth along mountain side, Foundations of Carpenter and Machine Shops; facing northeast; August 13, 2014.

Site Map:

Figure 12. Existing Improvements at Pine Creek taken from Morgan Creek Road, provided by Jeff Francis, Pacifica Development Inc.

Site Map:

Figure 13. Existing Improvements at Pine Creek, provided by Jeff Francis, Pacifica Development Inc. The area between Adit A, Building 1 and Building 2 was enclosed until 2002.

List of Existing Improvements
At the Pine Creek Mine Facility
July 25, 2013

No.	Description/Purpose	Type	Location	Year	MIS Pg
A	Main Portal Easy Go	Tunnel - Steel Shoring	Main Portal	1970	134
B	Maintenance Portal - Easy Go	Tunnel - Steel Shoring	Main Portal	1970	136
C	Brownstone Portal	Tunnel Brownstone	Upper Level SW	1974	
1	Bit Sharpener Building	Single Story - Steel	Main Portal	1970	
2	Mine Engineering Building	Two Story - Steel	Main Portal	1970	136
3	Crusher/Dumper Building	Multi-Story - Steel	Main Portal	1970	136
4	Carpenter Building/Warehouse	Single Story - Steel	Main Portal	1970	136
5	Locomotive/Substation Bldg	Single Story - Steel	Maintenance Portal	1970	136
6	Ore Bin w/ Elevator - Round	Three Story - Steel	Mid-Level	1970	136
7	Clarifier - Roofless Tank	Single Story - Steel	Crusher/Mid-Level	1970	136
8	Electrical Substation - SCE	Fenced Area	Lower Mid-Level	1984	
9a	Avalanche Warehouse	Single Story - Steel	Lower Mill Site Area	1970	
9b	Old Warehouse	Single Steel/Wood	Lower Mill Site Area	1941	
10	Residential / Former Office	Two Story - Wood	Lower Front Area	1941	
11	Residential / Former Infirmary	Two Story - Wood	Lower Front Area	1941	
12	Metals Lab	Single Story - Steel	Lower Front Area	1941	
13	Exempt Hydro P-13163	Single Story - Steel	Lower Front Area	1941	
14	Mine Water Discharge	Surge Chamber - Steel	Lower Front Area	2005	
15	Maintenance Building - New	Single Story - Steel	Lower Front Area		
16	Front Entrance Bridge	Pre-Assembled Steel	Lower Front Area	2005	

List of Existing Improvements
At the Pine Creek Mine Facility
July 25, 2013

No.	Description/Purpose	Type	Location	Year	MIS Pg
17	Easy Go Access Road	Graded Access Road	Upper Mill Site Area	1960	
18	Morgan Creek Road	Graded Access Road	Morgan Creek Canyon	1939	
19	Tramway Towers - Multiple	Wood Timber Trusses	Morgan Creek to Zero	1940's	
P0	Mine Water Discharge Pipe	Steel Conduit Pipe	Upper Mill Site Area	1970	
P1	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
P2	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
P3	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
P4	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
P5	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
P6	Mine Water Discharge Ponds	Concrete Lined (6 count)	Lower Mill Site Area	2005	
Existing Mining & Other Equipment					
E1	Ore Cars – Loaded	Mining Equipment	Maintenance Portal	1999	
E2	Locomotive Railway Line	Mining Equipment	Main / Maint. Portals	1970	
E3	Ore Cars & Locomotives	Mining Equipment	Crusher Building	1999	
E4	Crane – Maintenance	Maintenance Equipment	Maintenance Portal	1970	
E5	Mine Compressor	Mining Equipment	Maintenance Portal	1970	
E6	Power Poles & Lines	Utilities – Electric	Upper/Lower Site		

Figure 14. Existing Improvements at Pine Creek, provided by Jeff Francis, Pacifica Development Inc.

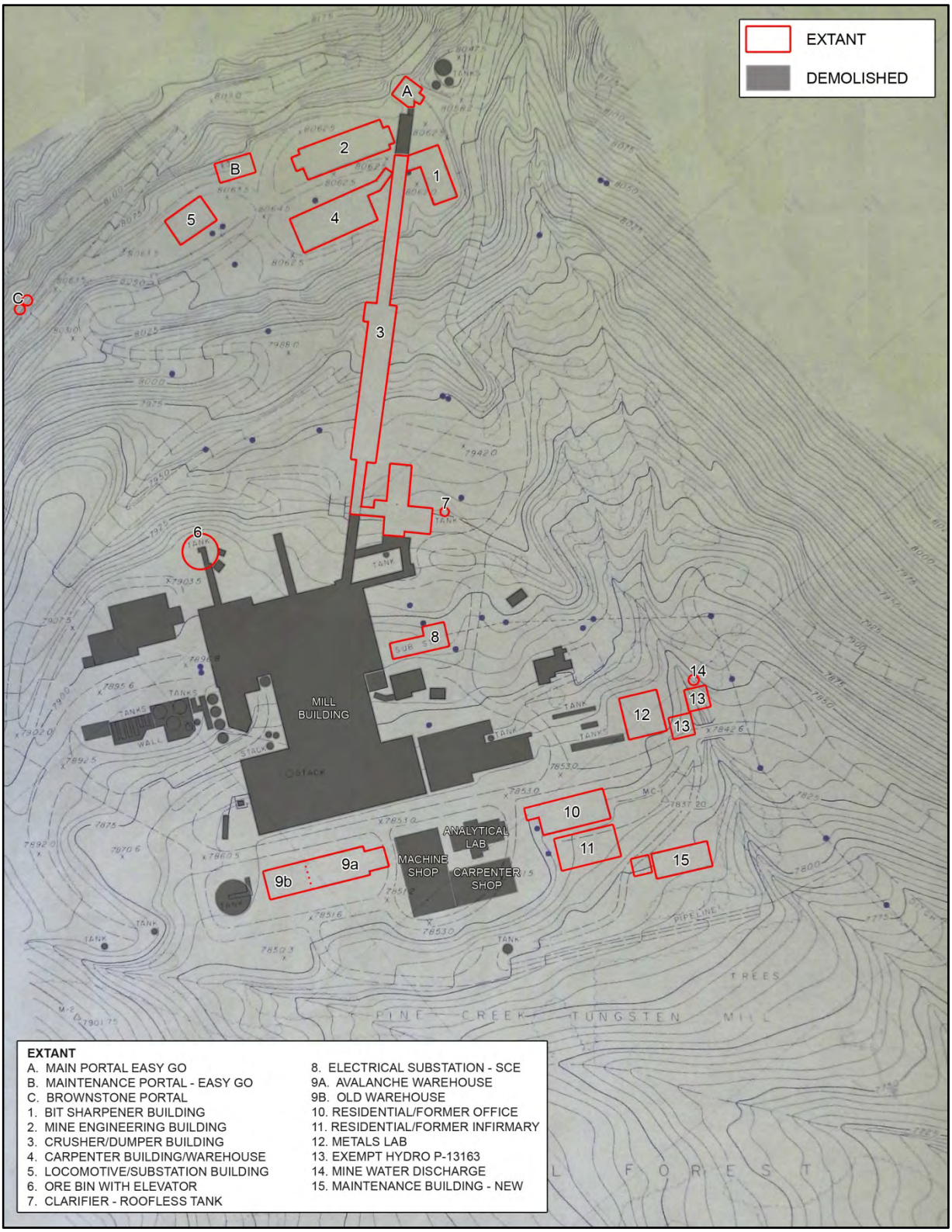

Figure 15. Mill Site near Easy Go showing extant and demolished buildings (Base map, "Pine Creek Mine, Inyo County, California, Property Map," no date; provided by Pine Creek Mine).

Appendix C: Record Search

EASTERN INFORMATION CENTER

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

Department of Anthropology, University of California, Riverside, CA 92521-0418

(951) 827-5745 - Fax (951) 827-5409 - eickw@ucr.edu

Inyo, Mono, and Riverside Counties

October 31, 2013

CHRIS Access and Use Agreement No.: 6

EIC-INY-ST-2404

Shelly Davis-King
Davis-King & Associates
PO Box 10
Standard, CA 95373

Re: Cultural Resources Records Search for the Pine Creek Mine Hydroelectric Project

Dear Ms. Davis-King:

We received your request on October 23, 2013, for a cultural resources records search for the Pine Creek Hydroelectric project located in Sections 5 and 8, T.6 and 7S, R.30E, MDBM, in the Pine Creek Tungsten Mill area of Inyo County. We have reviewed our site records, maps, and manuscripts against the location map you provided.

Our records indicate that four cultural resources studies have been conducted within a quarter-mile radius of your project area. One of these studies involved the project area. One additional study provides an overview of cultural resources in the general project vicinity. Copies of the title pages of the reports are included for your reference. All of these reports are listed on the attachment entitled "Eastern Information Center Report Listing" and are available upon request at 15¢/page plus $40/hour for hard copies and 25¢/page plus a $25 flat fee and $40/hour for PDFs.

Our records indicate that one cultural resources property has been recorded within a quarter-mile radius of your project area. This property involved the project area. A copy of the record is included for your reference. All of these resources are listed on the attachment entitled "Eastern Information Center Resource Listing".

The above information is reflected on the enclosed maps. Areas that have been surveyed are highlighted in yellow. Numbers marked in blue ink refer to the report number (IN #). Cultural resources properties are marked in red; numbers in black refer to Trinomial designations, those in green to Primary Number designations. National Register properties are indicated in light blue.

Additional sources of information consulted are identified below.

National Register of Historic Places: no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Archaeological Determinations of Eligibility (ADOE): no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Historic Property Directory (HPD): no listed properties are located within the boundaries of the project area.

Note: not all properties in the California Historical Resources Information System are listed in the OHP ADOE and HPD; the ADOE and HPD comprise lists of properties submitted to the OHP for review.

Copies of the relevant portions of the 1949 USGS Mt. Tom 15' and the 1912 USGS Mt. Goddard 30' topographic maps are included for your reference.

As the Information Center for Inyo County, it is necessary that we receive a copy of all cultural resources reports and site information pertaining to this county in order to maintain our map and manuscript files. Confidential information provided with this records search regarding the location of cultural resources outside the boundaries of your project area should not be included in reports addressing the project area.

Sincerely,

Gayat Adame
Information Officer

Enclosures

Eastern Information Center Report Listing

Report No.	Year	Author(s)	Title	Affiliation	Pages	Resources	----- Acreage ----- Survey	Monitoring
IN-00248	1986	MILLER, BRIAN	ARCHAEOLOGICAL RECONNAISSANCE REPORT - UMETCO BORROW PIT	INYO NATIONAL FOREST	4	0	5.00	0.00
IN-00273	1986	WERNER, ROGER H.	TUNGSTAR HYDROELECTRIC PROJECT ARCHAEOLOGICAL SURVEY	AUTHOR(S)	5	0	25.00	0.00
IN-00276	1992	HANEY, JEFFERSON W.	WRITTEN IN BEDROCK: PREHISTORIC ACORN USE IN THE EASTERN SIERRA NEVADA		229	0	0.00	0.00
IN-00676	2002	Hornick, Martin	Heritage Resources Report (Pine Creek Trail Reconstruction)	Inyo National Forest	7	0	31.52	0.00
IN-00826	2008	Michael R. Hilton	HRR No. 2008-05-04-01282, Heritage Resources Report	Inyo National Forest	8	0	0.10	0.00

Appendix D: NAHC Response Letter

STATE OF CALIFORNIA Edmund G. Brown, Jr., .Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916) 373-3715
Fax (916) 373-5471
Web Site www.nahc.ca.gov
Ds_nahc@pacbell.net

February 19, 2014

Ms. Shelly Davis-King, RPA
Davis-King & Associates
P.O. Box 10
Standard, CA 95373

Sent by U.S. Mail
No. of Pages: 3

RE: Sacred Lands File Search and Native American Contacts list for the **"Pine Creek Mine Hydroelectric Project;"** located in the Community of Rovana; Inyo County, California

Dear Ms. Davis-King:

A record search of the NAHC Sacred Lands Inventory **failed to indicate** the presence of Native American traditional cultural places in the Project site(s) or 'area of Potential effect' (APE), submitted to this office. Local tribes consider the Round Valley/Rovana area very culturally sensitive. Note also that the absence of archaeological and/or Native American cultural resources does not preclude their existence at the subsurface level.

In the 1985 Appellate Court decision (170 Cal App 3rd 604), the Court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources impacted by proposed projects, including archaeological places of religious significance to Native Americans, and to Native American burial sites.

Attached is a list of Native American tribes, Native American individuals or organizations that may have knowledge of cultural resources in or near the proposed project area (APE). As part of the consultation process, the NAHC recommends that local government and project developers contact the tribal governments and native American individuals on the list in order to determine if the proposed action might impact any cultural places or sacred sites. If a response from those listed on the attachment is not received in two weeks of notification, the NAHC request that a follow-up telephone call be made to ensure the project information has been received.

California Government Code Sections 65040.12(e) defines 'environmental justice' to provide "fair treatment of people...with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies." Also, Executive Order B-10-11 requires that state agencies "consult with Native American tribes, their elected officials and other representatives of tribal governments in order to

provide meaningful input into…the development of legislation, regulations, rules and policies on matter that may affect tribal communities."

If you have any questions or need additional information, please contact me at (916) 373-3715.

Sincerely,

Dave Singleton
Program Analyst

Attachments

Native American Contacts
Inyo County California
February 19, 2014

Big Pine Paiute Tribe of the Owens Valley
Genevieve Jones, Chairperson
P. O. Box 700 Owens Valley Paiute
Big Pine , CA 93513
G.Jones@BigPinePaiute.org
760- 938-2003
760-938-2942-FAX
(760) 938-2942-FAX

Bishop Paiute Tribe
Dale Chad Delgado, Chairperson
50 Tu Su Lane Paiute - Shoshone
Bishop , CA 93514
(760) 873-3584
(760) 873-4143 - FAX
(760) 873-4143

Fort Independence Community of Paiute
Israel Naylor, Chairperson
P.O. Box 67 Paiute
Independence CA 93526
Israel@fortindependence.
(760) 878-5160
(760) 878-2311 FAX
(760) 878-2311- Fax

Big Pine Band of Owens Valley THPO
Bill Helmer, Tribal Historic Preservation Officer
P.O. Box 700 Paiute
Big Pine , CA 93513
b.helmer@bigpinepaiute.org
(760) 938-2003
(760) 938-2942 - FAX
(760) 938-2942 fax

Bishop Paiute Tribe THPO
Raymond Andrews, THPO
50 Tu Su Lane Paiute - Shoshone
Bishop , CA 93514
(760) 873-8435 ext 250
(760) 920-0357 - cell - cell
gwest@ovcdc.com
(760) 873-4143 - FAX

Lone Pine Paiute Shoshone Reservation
Mary Wuester, Chairwoman
P.O. Box 747 Paiute
Lone Pine , CA 93545 Shoshone
(760 876-1034
760-876-8302 - FAX

(760) 876-8302

Lone Pine Paiute Shoshone Reservation
Kathy Bancroft, Cultural Resources Officer
P.O. Box 747 Paiute
Lone Pine , CA 93545 Shoshone
406-570-5289
kathybncrft@yahoo.com
760-876-8302 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list s only applicable for contacting locative Americans with regard to cultural resources for the proposed Pine Creek Mine Hydroelectric Project; located in the Community of rovana; in northern Inyo County, Califvornia for which a Sacred Lands File search and Native American Contacts list were requested.

Appendix E: Jennie Newland Creation Story

D1930

Lee Warlie, Interpreter.

Jennie Newland, Informant.

ROUND VALLEY PAIUTE:

THE STORY OF CREATION

The creation story begins in Que-na-ba (Round Valley). There, at the mouth of Pine Creek, for generations past, we have been told that it is our birthplace. This place, which the Indians designate as the very spot, certainly looks like it. This place is circular, like that of an Indian camp of today. On the east side stand two pillars. They say that these are our father and mother. After they had grieved a long time, a greater spirit than they took pity on them and turned them into stone.

Coyote, in his wanderings, came upon a young maiden whom he followed to her home. After seeing her camp, he said to himself, "I must go and hunt ducks. I will bring them the ducks and in that way make a good impression. Maybe I can get the girl for my wife." After getting a string of ducks, he headed for the camp. He was greeted by the maiden and her mother. He presented them with his gift of ducks. The mother was

pleased, and right away she offered the hand of her daughter to the Coyote. He accepted with great happiness. Their toney was near-by. The girl led him there and built a fire for him. She told him to lie down and rest until the supper was ready. While he was there he noticed sets of teeth hanging all around on the wall of the toney. This set him to thinking very deeply. He planned carefully so that he could outwit these women. After seeing these teeth, he knew that they were destroyers of men. He was called to come and eat supper. They all ate together. He noticed something very peculiar about the way the ladies ate the ducks. They broke the bones by throwing them into their vaginas. He thought of the plans he had made and was more than ever determined to carry them out. After the evening meal was over, it was dark. They all went to bed. During the night things began to happen. Coyote went outside and got himself a tough piece of wood. He knocked the beast-woman senseless and changed them to normal human beings. Then, afterwards, he made love to the young maiden. He told them, "We will all go back to my country." The women agreed. They started out. Just as they were to descend to the valley below, the daughter became sick. The mother knew the reason of the sickness (i.e., child-birth). She sent Coyote to fetch some water. He did. Then the

event of creation took place. There were the stalwart Monos, Shoshone, and Paiute of the North, and many other tribes. They had bows and arrows and were also carrying many other things. They were playing on the sunny side of the canyon, shooting arrows, and many other games. Father Coyote called them together. He began to send them out in pairs in all directions. He sent all except one. This one was small, a poor specimen of mankind. He was short and carried a che-ve-nu. Father Coyote turned to him and bestowed all the blessings on him. "You shall be brave and invincible in all your undertakings, whether it be in sport or in war. You shall always live here, and this great valley shall belong to you. No other tribe shall take it from you. Go now and claim that which I, father Coyote, have bestowed on you." After saying this, father Coyote turned to his mate and said, "Let us go away from here. The memory of this event will only bring added sorrow to our dying days." They started out. Just as they were about to pass the doorway, a greater being, whom all the Indians fear, intervened. He said, "Stop, my good people. You have done your share for the good of the land, but the memory of it will linger, long and bitter. It will always cause you suffering. To save you from this, you are pillars of stone." To this day you can see the

two stones standing side by side, a mute evidence of this story. The tears streaming down their faces are also visible. The arrangement of the camp is the same as in that day. Any one wishing to see this place, can find it at Pine Creek in Round Valley.

Qwe-na-ba: Round Valley

Toney: Grass house

Che-ve-nu: Gathering basket for tabeose

Appendix F: Section 106 Consultation

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
MAR 27 2013

OFFICE OF ENERGY PROJECTS

Project No. 12532-001 - California
Pine Creek Mine Hydroelectric Project
Pine Creek Mine, LLC

Lynn Goodfellow, Managing Member
Pine Creek Mine, LLC
9050 Pine Creek Road
Bishop, CA 93514

Re: Section 106 Consultation Authorization.

Dear Mr. Goodfellow:

In your March 13, 2002, letter (see enclosure), you requested that we grant you permission to initiate Section 106 consultation on our behalf. By copy of this letter, we are authorizing Pine Creek Mine, LLC to initiate consultation with the California State Historic Preservation Officer, appropriate Native American tribes, and other consulting parties pursuant to 36 CFR § 800.2(c)(4) of the regulations implementing Section 106 of the National Historic Preservation Act. This consultation pertains to the licensing effort by Pine Creek Mine, LLC involving the Pine Creek Mine Hydroelectric Project located in Inyo County, California.

As requested in your letter, we are granting authorization to Pine Creek Mine, LLC in order for them to conduct day-to-day Section 106 consultation responsibilities in regards to the above relicensing effort. However, the Commission remains ultimately responsible for all findings and determination.

If you have any questions, please contact Dr. Frank Winchell at 202-205-6104.

Sincerely,

for

Timothy J. Welch, Chief
West Branch
Division of Hydropower Licensing

cc letter w/enclosure:

Appendix G: Chronological List of Contacts/Pine Creek Mine Hydroelectric

Chronological List of Contacts/Pine Creek Mine Hydroelectric
Davis-King & Associates (Shaded entries predate DKA involvement)
April 2011- April 2015/Page 1

Date	Who? Affiliation?	Method	Substance
2011 April	Lone Pine Paiute-Shoshone Tribe	Letter	Asking Tribe if they wish to participate in licensing process.
2011 April	Fort Independence Indian Reservation	Letter	Asking Tribe if they wish to participate in licensing process.
2011 April	Bridgeport Paiute Indian Colony of California	Letter	Asking Tribe if they wish to participate in licensing process.
2011 April	Bishop Paiute Tribe	Letter	Asking Tribe if they wish to participate in licensing process. Letter received from Tribe saying they would like to consult.
2011 April	Big Pine Paiute Tribe	Letter	Asking Tribe if they wish to participate in licensing process.
2011 April	Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation	Letter	Asking Tribe if they wish to participate in licensing process.
2011 May 12	Bishop Paiute Tribe	Letter	Tribe request to participate in projects consultation in four FERC applications.
2011 May 20	SHPO	Notice of Intent/PAD	Filing of Notice of intent to file license application, filing of pre-application document (PAD) to initiate consultation and request comments on PAD and Scoping Document, plus identification of issues and associated study requests
2013 April 10	SHPO	Letter	Letter from Licensee to SHPO to initiate consultation and request for concurrence on Area of Potential Effects (APE)
2013 May 13	SHPO	Letter	Letter to Applicant regarding adequacy of APE,
2013 June 10	USFS	Letter	Letter to FERC regarding inadequacy of APE, need to collaboratively consult with Forest, need for prehistoric and historic era resource discussion, and consultation with Native Americans
2013 Sept 30	Raymond Andrews/Bishop Paiute THPO	Email/Visit	Sent Mr. Andrews an email that I would be in Bishop, and asked to meet with him. Went to office to meet regarding the project; he had left for the day due to the government shutdown; left a message regarding the project and asking him to contact me.
2013 Oct 1	Raymond Andrews/Bishop Paiute THPO	Email	Received email from Mr. Andrews acknowledging receipt of my business card and note, and letting me know his availability.

Date	Who? Affiliation?	Method	Substance
2013 Oct 8	Raymond Andrews/Bishop Paiute THPO	Email/PowerPoint	Sent Mr. Andrews an email requesting a meeting regarding the project, and asking if he would like to attend a field meeting with me. Also sent him an older version of a PowerPoint presentation to familiarize himself with the project.
2013 Oct 8	Bill Helmer/Big Pine Paiute THPO	Email/PowerPoint	Sent Mr. Helmer an email requesting a meeting regarding the project, and asking if he would like to attend a field meeting with me. Also sent him an older version of a PowerPoint presentation to familiarize himself with the project.
2013 Oct 15	Bill Helmer/Big Pine Paiute THPO	Telephone	Mr. Helmer telephone to discuss a possible meeting time. He asked if I could meet with his cultural committee in the coming week, and invited me to attend the Big Pine Fandango on Saturday, 19 October, so I could discuss issues with the tribe. I agreed to send him some documentation about the project, and he will get back to me regarding the meeting. Also he mentioned the creation story of the Pine Creek area by Jim Tom Jones, and said he would send me some information.
2013 Oct 15	Raymond Andrews/Bishop Paiute THPO	Telephone	Telephoned Mr. Andrews to discuss a possible meeting time. He asked if I could meet with his cultural committee this coming Thursday evening to explain the project, and then perhaps attend the field meeting on Friday. We agreed that I would send him some documentation about the project. He mentioned that the whole Pine Creek area was a sacred area from Rovana on up, and that while there may not be much of an impact, he wanted me to know about this. We will discuss more at the meetings.
2013 Oct 15	Raymond Andrews/Bishop Paiute THPO	Email	Sent Mr. Andrews information he requested. This included a Project Description and two versions of the previous APE map.
2013 Oct 17	Bishop Paiute THPO Advisory meeting	Meeting	Attended the Bishop Paiute Tribe Tribal Historic Preservation Office (THPO) Tribal Historic Preservation Advisory Committee at their Monthly Meeting (see Contact Report). Explained the project and provided background information. Questions were raised about groundwater contamination, land ownership, what happens to the water when it leaves the turbine, the relationship of this project to the "Kelly" project and other projects. Although they expressed that the areas have been compromised by the mining activities ("the damage is already done"), it must be recognized that Pine Creek canyon is the location of the origin story of the Paiute people and that the canyon is full of cultural trails to get to the higher mountains. With respect to the Bishop Paiute Tribe having been originally interested in being a project partner, the Tribe is said to have backed away because they were concerned about the contaminants. They might be interested still if the contaminants are not an issue. The THPO Advisory Committee can only pass information along to the Tribal Council, and ask the Tribal Council to make a decision about the project.

Date	Who? Affiliation?	Method	Substance
2013 Oct 18	Raymond Andrews	Telephone	Mr. Andrews called to say that he could not attend the field meeting today.
2013 Oct 18	Big Pine Paiute Tribe THPO Committee	Meeting	The Big Pine THPO and two members of the Advisory Committee met with me at the project site to look at the mine and better understand it. Before discussion, we read one of the Paiute creation stories that happens here in Pine Creek canyon (see contact report). There were no concerns about the project expressed.
2013 Nov 2	Big Pine Paiute THPO	Email	Sent draft contact report for review.
2013 Nov 2	Bishop Paiute THPO	Email	Sent draft contact report for review.
2013 Nov8	Bishop Paiute Economic Development	Telephone	Manual Ruiz, head of the Bishop Paiute Tribe Economic Development Department called to talk with me about the Pine Creek Mine Hydro Project. He had been provided information about the project from the THPO Advisory Committee and wanted background information. I explained how the Tribe had been involved previously, and what the current status was. I suggested he contact Mr. Goodfellow and provided him with contact information. He said he would talk with the Tribal Council about this and get back to me.
2014 Feb 13	USFS/Sheila Irons	telephone	Called Ms. Irons to reintroduce myself and ask if I might visit with her to discuss the project. She said there is a new Forest Archaeologist, and she would prefer to wait until the new archaeologist could meet or confer. She said she would arrange and get back to me. Later she called to say that neither were available on 14 Feb, but that we could have a conference call the following week.
2014 Feb 14	USFS/Sheila Irons and Jacquie Beidl	telephone	See contact report. Discussed project status, cultural resources issues, and meeting dates. They also suggested that DKA would have needed a permit to conduct studies since they were on "BLM land." I suggested that the land was not owned by BLM but the unpatented mining claims did have a relationship with BLM in the form of annual claim payments.
2014 Feb 15	Native American Heritage Commission	Letter	Requested Sacred Land Files Information.
2014 Feb 18	Native American Heritage Commission/Dave Singleton	Email	Mr. Singleton sent me an email to say that he is responsible for Inyo County and the southern half of California from Modesto down to the US-Mexico Border for the past seven years. Mt. Tom is sacred to the folks at the Bishop Paiute Tribe and is usually featured on the "tribal flag."
2014 Feb 19	Native American Heritage Commission	Letter	NAHC reported that the Sacred Land Files failed to indicated the presence of Native American cultural places but that the Round Valley/Rovana areas is considered very sensitive. They also provided (outdated) contact Information for tribal groups.

Date	Who? Affiliation?	Method	Substance
2014 Feb 21	Bill Helmer/Big Pine	Telephone	Asked if he had concerns about the project, and he said that there was "not much to be concerned about" the way the project was described. He will review the memo.
2014 Mar 5	USFS/Jacquie Beidl	Email	Sent her some project information and clarification on meeting time 20 March.
2014 Mar 21	USFS/Jacquie Beidl/Colleen Nicholas	Meeting	Met with the new Inyo NF Archaeologist Beidl and South Zone Archaeologist Nicholas regarding the Pine Creek Mine Project. Explained to them the work that was done to date, the desire to include them in all of the studies, and a general discussion of FERC licensing process. They provided a list of items that they would like addressed in the report, and these will be entered. Some items of concern to them are not within the current scope, but might be addressed in future studies. We arranged to meet the second week of April for me to review USFS files and to provide a draft of the cultural resources report.
2014 Mar 25	USFS/Jacquie Beidl	Email	Contacted Ms. Beidl to let her know about the FERC letter issued 21 March 2014 denying an extension of the term for the preliminary permit, and that I intended to submit my draft report to her still, and that some Native American consultation would be ongoing while the report is under review. Cancelled meeting to be held at Inyo NF offices.
2014 Apr 11	USFS/Jacquie Beidl	Email	Sent an email to Ms. Beidl that the draft report is ready, and provided her with the text of the response to the USFS letter for her to respond before the draft report is issued.
2014 Apr 16	USFS/Jacquie Beidl; Big Pine THPO; Bishop THPO; BIC EPA; FT Ind THPO; FERC Winchell	Email	Sent copy of draft cultural resources report for review and comment. Asked to have them contact me if they would like a printed copy.
2014 Apr 29	USFS/Jacquie Beidl; Big Pine THPO; Bishop THPO	Email	Message asking if I could provide any additional information and requesting their comments and additions by the middle of May.
2014 Apr 30	USFS/Jacquie Beidl	Email	USFS received report and will be reviewing shortly.
2014 Apr 30	Big Pine THPO/Helmer	Telephone	Telephone call regarding the report, with memo follow up. No real concerns– asked to have consultant statement altered to say they do wish to consult; also change a couple of references.
2014 May 2	Big Pine THPO, USFS, SHPO, FERC	Email	Memo detailing Big Pine Tribe's comments on Cultural report.
2014 May 5	USFS/Jacquie Beidl	Email	Email acknowledging receipt of Big Pine Tribe's comments.

Date	Who? Affiliation?	Method	Substance
2014 June 3	USFS/Jacquie Beidl	Email	Reminder request for comments.
2014 June 3	USFS/Jacquie Beidl; Bishop THPO; BIC EPA; FT Ind THPO; FERC Winchell	Email	Reminder request for comments.
2014 June 3	USFS/Jacquie Beidl; Bishop THPO	Read Receipt	Received "read receipt" for the preceding email contact.
2014 June 9	Big Pine THPO/Helmer	Email	Request for references
2014 June 10	Big Pine THPO/Helmer	Telephone/Email	Request for references received and incorporated into report.
2014 June 10	Bishop THPO/Andrews	Telephone/Email	Followup on any comments; notified him that we would be sending in draft final report to SHPO and would copy him on the transmission.
2014 June 11	Susan Stratton/CA OHP	Telephone	Called OHP to request information on submission letter format and discussion of the type of letter we might expect from OHP.
2014 June 12	USFS/Jacquie Beidl; Bishop THPO; BIC EPA; FT Ind THPO	Email	Transmitted signed letter to SHPO and PDF of draft final report
2014 June 13	OHP, Lone Pine THPO, Utu Utu Gwaitu	US Mail	Transmitted paper copies of draft final report and letter
2014 June 14	Sheila Irons/USFS	email	forwarded a copy of the FERC elibrary posting of cultural report
2014 June 16	Sheila Irons/USFS	email	received confirmation that June 14 email had been received.
2014 July 1	Susan Stratton/CA OHP	telephone call	received call back from OHP that this particular project was in the Architectural Review and Environmental Compliance Unit, and that while she was not involved, she would follow through and see what she could find out. She said that Tim Brandt's unit would be involved.
2014 July 1	Susan Stratton/CA OHP	email	The project was logged in June 16 to Kathleen Forrest (Historian). On June 30 it was referred to Alicia Perez for review. The due date of the project letter is July 16. It does not appear from the data base information that the review has been completed yet.

Date	Who? Affiliation?	Method	Substance
2014 July 14	SHPO to FERC and Goodfellow	letter in eLibrary	Letter from SHPO refusing to review report because the APE is the first thing that needs to be considered, and there is no APE designated.
2014 Aug 22	USFS/Jacquie Beidl	email	Need information about report format
2014 Aug 22	Big Pine THPO/Helmer	email	Informed office that additional Cultural Resources studies have been conducted and asked if he would like to consult. Notified him that the Tribe would receive draft report to review.
2014 Aug 22	Bishop THPO/Andrews	email	Informed office that additional Cultural Resources studies have been conducted and asked if he would like to consult. Notified him that the Tribe would receive draft report to review.
2014 Aug 27	Big Pine THPO/Helmer	email	Mr. Helmer contacted me to say the Tribe would like to consult and would like to receive the draft report to review.
2014 Sept 10	Big Pine THPO/Helmer	email	Contacted Mr. Helmer to say that we would be providing the draft report for review in the next month.
2015 Mar 24	Big Pine THPO/Helmer	email	Request for Jim Tom Jones story to include in report; notice that the project is starting back up again. Several other email were sent prior to this, but due to a computer crash, there is no record of them. None were substantive.
2015 April	BIG Pine Tribe/Chair	email	Sent copy of CRIER for review
2015 April	Bishop Tribe Chairman	email	Sent copy of CRIER for review
2015 April	Fort Independence Chairperson	email	Sent copy of CRIER for review
2015 April	Bridgeport Indian Colony Chairman	email	Sent copy of CRIER for review
2015 April	Lone Pine Paiute/Shoshone Chair	email	Sent copy of CRIER for review
2015 April	Benton Paiute Chair	email	Sent copy of CRIER for review

Appendix H: Memo From Big Pine Paiute Tribe of Owens Valley

Davis-King & Associates
Heritage Resources Management
Post Office Box 10 • Standard • California • 95373
Courier Delivery: 17301 Fitch Ranch Road • Sonora • CA 95370
Electronic Mail • shellydk@frontiernet.net•Cell Phone (209) 694-0420
Telephone (209) 928-3443

TO:	Bill Helmer,
FROM:	Shelly Davis-King
DATE:	30 April 2014
SUBJECT:	Telephone conversation

Page 16, Item 5: would like to change the consultation statement for the Big Pine Tribe to "Big Pine Paiute Tribe of the Owens Valley: Letter asking if the Tribe would like to participate in the licensing process. Big Pine Tribal THPO responded that they would like consult and be involved." The Tribe does wish to consult.

The references to the creation stories should be changed in the bibliography. He will get me the proper citation

Otherwise the report looks okay.

Appendix I: Historic Resources Consultation

JRP HISTORICAL CONSULTING, LLC

2850 Spafford Street • Davis, CA 95618 • (530) 757-2521 • (530) 757-2566 Fax • www.jrphistorical.com

Stephen R. Wee, Principal / President
Rand F. Herbert, Principal / Vice President
Meta Bunse, Partner
Christopher D. McMorris, Partner

Eastern California Museum
155 N. Grant Street
Independence, CA 93526
(760) 878-0258

Mono Basin Historical Society
129 Mattley Ave.
Lee Vining, CA 93541
(760) 647-6461

The Laws Railroad Museum and Historic Site
P.O. Box 363
Bishop, CA 93515
(760) 873-5950

Bishop Chamber of Commerce
690 N Main Street
Bishop, CA 93514
(760) 873-8405

August 26, 2014

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

To Whom It May Concern:

Pine Creek Mine, LLC is proposing a hydroelectric project west of the community of Rovana in Inyo County, California. The proposed project is located on private property, and would be constructed using private funds. The work is subject to federal oversight via the Federal Energy Regulatory Commission (FERC), who authorized Pine Creek Mine LLC to initiate the Section 106 consultation on their behalf. JRP is contacting interested parties on behalf of Pine Creek Mine regarding historical resources and the proposed hydroelectric project.

The proposed project is as follows:

Water is currently flowing out of the inactive Easy Go Adit of the Pine Creek Mine, which has been plugged (the plug was closed by placing a steel plate over the man-hole and closing the valves on the manifold to restrict the flow of water behind the plug). Existing discharge piping facilities would be used to control flow and head potential to create hydroelectric power.

All generating facilities would be located entirely underground in the existing mine. The proposed Project would use the existing mine operation substation connections to the local utility, which is sized for several times the expected output of the proposed development. The connecting substation is connected to a Southern California Edison -owned substation and transmission line. This power line will be connected to the generator at the plant end and the other end connected to the owner-owned substation. No new buildings or other facilities nor any modifications to existing buildings are proposed. Manufacturing of all new generating facilities and substantial pre-assembly would occur off site and would be trucked to the project location. A portable crane would lift and position the wheeled generating equipment onto the existing railroad track for delivery to the plug location by a locomotive for final assembly.

Haul routes for all new equipment would occur on existing County roads, and on mine access roads on private land designed for heavy equipment. No grading, widening or other improvement of any road is necessary or proposed. During construction there will be two staging areas, each approximately forty feet square, at the entrance to the portals. There are no areas proposed for any ground disturbance as existing facilities will be used.

Project operations and maintenance will be the primary activities that occur on project lands. This will include operating and maintaining the project powerhouse and associated facilities. Maintenance activities will include the tunnel and water conveyance maintenance.

JRP Historical Consulting, LLC has been retained to conduct a study to survey and evaluate mining-related buildings and structures that may be affected by the project for their eligibility to be listed in the National Register of Historic Places (NRHP) and/or the California Register of Historical Resources (CRHR). This study is one part of the environmental studies for the proposed project, and is being conducted as part of project compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

If you or your organization has any information or concerns regarding historic resources in the areas that could be affected by this project, please respond in writing to the address provided above within the next thirty days. Please note this is not a request for research, just for information. You may also respond to me via email at: rherbert@jrphistorical.com. A list of organizations receiving this letter is also enclosed for your information. Thank you.

Sincerely,

Rand Herbert
Principal / Architectural Historian

Enclosure:

Architectural Area of Potential Effect (APE) Map