4.4 CULTURAL RESOURCES

This section describes the nature and extent of cultural resources located within the Park that have the potential to be impacted as a result of Project implementation. The general and site-specific profiles of resources contained herein provide the baseline by which environmental impacts are identified and measured. The discussion of the cultural and regulatory settings is followed by an assessment of impacts to resources at the programmatic and project level. Mitigation measures are provided that are designed to avoid or minimize potential impacts resulting from Project implementation.

DPR contracted with the Anthropological Studies Center (ASC) of Sonoma State University to develop a historic context, perform cultural resource inventory and evaluation studies within the Park, as well as to update the National Register of Historic Places (NRHP) nomination for the Empire Mine Historic District (District). Mark Selverston, M.A., served as principal investigator for the studies. The ASC prepared two reports under this contract: Historic Context for Empire Mine Historic District (Selverston 2008a) and Intensive Cultural Resources Survey of Empire Mine Historic District (Selverston 2008). The following sections draw extensively from information provided in the above referenced reports for the characterization of cultural resources located within the Park. The reports (Selverston 2008, 2009) are included as Appendices F-1, Empire Mine Historic Context for Empire Mine Historic District, and F-2, Intensive Empire Mine Cultural Resources Survey of Empire Mine Historic District, to this Draft PEIR.

4.4.1 Existing Conditions

4.4.1.1 Methods

ASC completed a full accounting of known cultural resources within the Park through an extensive literature review, records searches at the North Central Information Center (NCIC) and DPR archives, and a comprehensive field survey and building assessment. The following section details the methods used in the study.

Records Search

Records searches for this study had two primary purposes: to determine whether known archaeological or historic resources are located within the study area; and to determine the likelihood of unrecorded resources based on the distribution and topographic characteristics of known sites.

Mark Selverston of the ASC conducted a records search at the NCIC in February 2008 in order to examine records of all previously documented cultural resources and targeted studies within and adjacent to the Park. The records search also included a review of California Inventory of Historic Resources (DPR 1976), California Historical Landmarks (OHP 1990b), California Points of Historical

Interest (OHP 1992), and the Historic Properties Directory (through 4 December 2007). The Historic Properties Directory (HPD) includes updated listings of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks, and California Points of Historical Interest.

Information collected in the course of research at the NCIC was supplemented with pertinent archival information compiled by DPR staff in early 2008 using files maintained at the DPR Northern Service Center in Sacramento, at the Sierra District Office in Tahoma, as well as the archive located at the Park. Information collected in the course of the archival review at DPR facilities was provided to ASC staff.

ASC digitized and georeferenced historic maps and Master Title Plats within a geographic information system (GIS), including a total of 52 mineral survey plats, filed with the federal government between 1867 and 1942; the U.S. Special Folio for Grass Valley (1890) and county maps (1880, 1884, and 1913). The historic maps provided a basis for the archeologists to more accurately date and provide associated specific contexts for extant features within the Park.

In the course of his record search, Selverston reviewed nine studies previously conducted within the Park boundaries and another 19 studies adjacent to or nearby the Park (2009). The reports document a wide variety of archaeological and structural features, the majority of which are associated with historic mining and related settlement activities.

Past studies reviewed in the course of the records search include Lortie and Docken (1980), Camby (1982), Tordoff (1987), Jensen and Associates (1991a), Green (2006), Jaffke (206), and MFG, Inc. (2008). The past studies were largely archaeological in nature, with one exception. The most comprehensive documentation of the standing buildings within the Park was conducted by Camby (1982), who recorded 46 buildings and structures in detail. Work undertaken by Jensen and Associates (1991a) resulted in the identification of the Park's only known prehistoric resource, consisting of a bedrock milling feature.

In total, the research revealed the presence of 55 "sites/structures of an archaeological nature within the current Park boundary, and 46 documented standing buildings/structures. Additionally, there are another 15 sites located nearby" (Selverston 2009). The inventory of discreet features associated with the previously recorded resources was used by Selverston (2009) to develop predictions about the types and locations of previously undocumented resources present within the Park. Based on the expectations, "a feature-driven survey approach was chosen as the most efficient method for the field survey, involving detailed documentation of every feature encountered" (Selverston 2009).

The NRHP Nomination for the Empire Mine Historic District (Welts 1976) "describes 19 contributing buildings/structures that add to the District's significance under historic archaeology, architecture, and industry for the periods 1800-1899 and post-1900" (Selverston 2009). The Historic District conforms to the boundary of the Park as it existed in 1976, and not to the actual limit of the Empire Mine property, which is larger. The actual number and range of features that contribute to the significance of the Historic District is much larger than the Nomination presently acknowledges.

Field Survey

Fieldwork at the Park was divided into two components: a building assessment and archaeological survey. Mark Selverston and Judith Marvin completed the building assessment over the period of two days in June 2008. The architectural review examined, photographed, and noted the condition of each standing "building, structure, and object associated with the Empire Mine and Mill, Bourne Cottage, and other structures, residences, outbuildings, and support structures" at the Park (Selverston 2009).

TABLE 4.4-1
IDENTIFIED FEATURES IN THE PARK

Feature Type	Count	Feature Type	Count	Feature Type	Count
Adit	42	Flat	31	Pond	1
Artifact	2	Flume	2	Pool	1
Artifact Deposit	103	Foundation	168	Privy	5
Automobile	1	Garage/Carriage House	7	Prospect	445
Bedrock Milling Feature	1	Garden Shed	1	Pumphouse	1
Berm	6	Gate	2	Ramp	8
Blacksmith's Shop	1	Guest Cottage	3	Reservoir	3
Canal	1	Head Frame	1	Road	124
Cellar	5	Hoist	1	Shaft	69
Channel	8	Hoist House	1	Shed	3
Chicken House/Coop	2	Hole	35	Single Family Dwelling	10
Chimney	2	Landscaping	2	Single Family Dwelling/ Conservatory	1
Cistern	3	Lime Shed	1	Sluice Box	1
Clubhouse	1	Machine Shop	1	Tailings	5
Compressor Building	1	Machinery	2	Tool Shop	1
Corral/Stable	2	Mill Structure	1	Trail	9

Feature Type	Count	Feature Type	Count	Feature Type	Count
Culvert	1	Mine Manager's Office/Refinery	1	Tramway	2
Cut	21	Mining Landscape	23	Transformer House	4
Cut Bank	29	Monitor	8	Utility	14
Dairy	1	Monument	23	Vegetation	3
Dam	15	Mound	8	Wagon Road	60
Depression	6	Orchard	4	Wall	60
Ditch	125	Ore Bins	1	Waste Dump	138
Drain Outlet	2	Penstock	14	Water Box	1
Engineer's Office	1	Pipe	8	Water Tank	1
Fence Line	37	Placer Tailings	2	Well	2
				Wood Shed	2
				Total Features	**1684**

Source: Selverston 2008b

Under the direction of Mark Selverston, the ASC performed an archaeological survey of the Park in May, June, and July 2008. The field crew, which varied from two to five individuals, surveyed in parallel transects, generally spaced 75 feet apart. The entire Park area was examined, with the exception of the 35-acre Sand Dam Area (Remediation Area 4). All resources encountered were documented and classified according to the feature type(s) present. The location of all resources was documented with a Trimble GPS, features and constituents were photographed, and a series of attributes were recorded. Data recorded includes each feature/context or site's functional type, size, material, form, and narrative descriptions. A list of the features is provided in Table 4.4-1, Identified Historic Features in the Park. A definition of each of these features is provided in Appendix F-2, Intensive Cultural Resource Survey of Empire Mine Historic District and Section 8.2, Glossary of Terms, of this Draft EIR.

Field data collected in tabular and spatial forms were compiled into a geospatial database along with digitized historic maps. The GIS was complimented by a "cultural resources context database," which stored more than 15 fields of data for each context encountered in the field (Selverston 2009). Ultimately, ASC identified 1,684 total features within the Park. These features were then categorized into 499 individual properties.

> "[The properties] represent distinct feature systems that share a common historical or physical association. In some cases the association is well known, as is the case of the Empire Mine and several other gold mines that have been interpreted in the Park. For other properties the historic association has yet to be identified" (Selverston 2009).

The 499 properties are further classified into 29 property types and one "unknown" type. The number of each property type identified within the Park is summarized below in Table 4.4-2, Summary of Historic Property Types within the Park.

TABLE 4.4-2
SUMMARY OF HISTORIC PROPERTY TYPES WITHIN THE PARK

Property Type	Count	Property Type	Count	Property Type	Count
Lode mine and mill complex	4	Ranch complex	2	Dam/reservoir	4
Lode mine complex	6	Homestead complex	1	Ditch	40
Placer mine complex	5	Dwelling	17	Penstock	2
Mining landscape complex	2	Artifact deposit	28	Drain outlet	3
Ancillary mining complex	1	Ranch element	2	Wagon road	30
Lode mine and mill complex	5	Corral	1	Rural road	36
lode mine	24	Orchard	1	Tramway	1
Placer mine complex	7	Fence line	6	Hole	10
Mining landscape	14	Utility line	9	Prospect	222
Tailings Impoundment	3	Monument	8	Unknown	5
				Total	**499**

Source: Selverston 2008b

4.4.1.2 Cultural Setting

Empire Mine State Historic Park is replete with cultural resources, reflecting a consequential chapter in the history of California. The Park is exceptional as an example of a wide range of historic mining techniques and technology. The vestiges of the Park's long mining tradition are located throughout the grounds and adjacent areas. Such vestiges take a wide variety of forms, represented by at least 79 historic feature types and 1,684 individual features. Despite the fact that only one prehistoric resource has been documented within the Park, Native American occupation of the area spans many millennia, the remains of which were undoubtedly disturbed and obscured by historic and modern land uses. With the foregoing in mind, the following summary of the cultural setting of the Park is offered. The summary is not exhaustive, yet provides a lens though which the extant resources within the Park can be understood.

Prehistoric Context

The prehistory of the northern Sierra Nevada spans at least 10,000 years and has been the subject of systematic research for more than 60 years. Significant archaeological research in the region, which forms the basis for modern interpretations of ancient life-ways, has been reported by: Elston (1971, 1972, 1982, 1986), Elston and Davis (1972); Kowta (1988), Elston et al. (1977), Hull (2007), Markley (1981, 1982), Markley and Henton (1985), Moratto (1984), and Jackson et al. (1994). Recently, Jaffke (2006) provided a synthesis of past work in the region applicable specifically to the Park that divides prehistory into three broad periods: Pre-Martis (ca. 10,000 to 5,000 years before present [B.P.]); Martis complex (ca. 5,000 to 1,300 B.P.); and Kings Beach complex (ca. 1,300 to 150 B.P.). The discussion of regional prehistory draws heavily from Jaffke's (2006) regional summary, entitled Archaeological Survey report and Extended Field Investigation for Memorial Trail, Empire Mine Historic Park, Grass Valley, CA.

The earliest evidence for occupation of the northern Sierra Nevada comes from archaeological assemblages attributed to a highly nomadic group of hunter-gatherers. This cultural pattern, which prevailed in California until roughly 8,000 years ago, is variously referred to as the Paleoindian or Early Holocene tradition. Diagnostic artifacts related to the earliest occupation of the region include large stemmed projectile points, and the occasional fluted projectile point. Cultural assemblages attributed to subsequent occupation of the Sierra Nevada (ca. 8,000 to 5,000 B.P.) suggest a broader diet, which included more plants and nuts. Population levels remained low and mobility remained high. Artifacts associated with this period of occupation include handstones, millingstones, Humboldt concave-base points, wide-stemmed points, as well as Pinto-like points.

The Martis complex, dated to approximately 5,000 to 1,300 B.P., reflects a broadening of resource exploitation and declining mobility in settlement patterns. Such changes can be observed throughout California in the archaeological record. Protein derived from hunted game was a staple of the Martis diet, although the use of handstones and millingstones signal the growing importance of nuts and plant material in the diet. The Martis complex, named for the locality in Placer County where it was first recognized, is distinguished by extensive use of basalt to manufacture flaked stone tools. The early phase of the complex, dated to approximately 5,000 to 3,000 B.P., is marked by the use of contracting and split-stem projectile points, while the late phase (3,000 to 1,300 B.P.) is marked by the use of corner- and side-notched points. Martis complex sites appear to have been located with reference to good hunting and seed-gathering locations.

The Kings Beach complex represents the latest cultural adaptation recognized in the northern Sierra Nevada. Heizer and Elsasser (1953) theorized that the Kings Beach complex represents occupation by ancestral Washoe populations. The complex is distinguished from earlier traditions by a preference for obsidian and chert over basalt; the use of bedrock milling features; the use of small, light, side-notched projectile points associated with bow and arrow technology; the rare occurrence of scrapers and near absence of drills; and a subsistence emphasis on fish, piñon nuts, seeds, and, to a lesser extent, hunting.

Ethnographic Context

The Park is located within the ethnographic territory of the Nisenan, sometimes referred to as Southern Maidu. The Nisenan, along with speakers of Maidu and Konkow, form a subgroup of the California Penutian linguistic family (Wilson and Towne 1978). The Nisenan linguistic group is further subdivided based on dialect into Northern Hill Nisenan, inhabiting the Yuba River and Bear River drainages (including the Wolf Creek drainage); Southern Hill Nisenan, living along the American River; and Valley Nisenan, occupying Sacramento Valley (Beals 1933; Kroeber 1925; Kroeber 1929). Prior to the widespread disruption of traditional lifeways in the 19th century, Nisenan territory encompassed the lower Feather River drainage, the Yuba River watershed, the entire Bear and American River drainages, and the upper reaches of the Cosumnes River.

Primary sources on Nisenan ethnography include Beals (1933), Faye (1923), Gifford (1927), Kroeber (1925), Littlejohn (1928) and Wilson and Towne (1978). The following summary is based primarily on Wilson and Towne (1978).

The basic social unit for the numerous Nisenan tribelets was the family. Tribelets were typically governed by a headman and tended to have one or more permanent village sites with smaller seasonal/temporary camps scattered throughout the tribelet territory for logistical resource procurement. Tribelets sharing similar cultural elements and linguistic traits comprised “nonpolitical ethnic groups,” which have been grouped by ethnologists into the language families we are familiar with today. Villages were frequently located on flats adjoining streams, and were inhabited mainly in the winter as it was usually necessary to go out into higher elevation zones to establish temporary camps during food gathering seasons (i.e. spring, summer and fall) (Kroeber, 1976).

Nisenan territory offered abundant year-round food sources. Food gathering was based on seasonal ripening, but hunting, gathering, and fishing occurred year round, with the greatest activity in late summer and early fall. The Nisenan gathered many different staples and as such did not depend on one specific resource (Wilson and Towne 1978).

Seasonal harvests could be communal or personal property. Most activities and social behaviors such as sharing, trading, ceremonies, and disagreements were important adjuncts to the gathering and distribution of food. Extended families or entire villages of Hill Nisenan would gather acorns. Men would hunt while women and children gathered acorns knocked from trees. Buckeye nuts, sugar and gray pine nuts, and hazelnuts were gathered as well.

Nisenan cracked and shelled acorns on a rock anvil and ground the acorns into flour using a bedrock mortar and a soaproot brush to control scattering. The flour was leached to remove the tannins and then cooked in watertight baskets. Cooking was done with fire-heated stones that were lifted with two sticks, dipped in water to clean them, and then dropped into the cooking basket. Enough soup and mush was usually prepared for several days. Roots were dug with a digging stick in the spring and summer and were eaten raw, steamed or baked. They were also dried and pounded in mortars and pressed into cakes to be stored for winter use. Wild onion (chan), sweet potato (sí kum), and “Indian potato” (dúbus) were the most desired. Wild carrot (ba) was used as medicine while wild garlic was used to wash the head and body. Grasses, herbs, and rushes provided food and material for clothing and baskets. Seeds were gathered using a seed beater and tray. They were then parched, steamed, dried, or made into mush. Many varieties of wild plums, native berries, grapes, and other native fruits were eaten. Manzanita berries were often traded in the valley to neighboring Nisenan bands or made into a cider-like drink. Game was baked, roasted, or dried (Wilson and Towne1978).

Deer drives were common, with several villages participating and the best marksman doing the killing. The animals were often driven into a circle of fire and then killed. Deer were also hunted using deadfalls, snares, and deerskin and antler decoys. Sometimes they were run down on soft ground or snow. Antelope were taken by surround, drives, and flag decoys while elk were usually killed along waterways on soft ground. The bear hunt was a ceremonial activity. Black bears were usually hunted in the winter. Lighted brands were often used to drive bears from their dens towards hunters waiting to dispatch the animals.

Historic Context

Following the settlement of San Diego in 1769, the Spanish made steady progress in the exploration and settlement of the coastal regions of Alta California. The Central Valley and the Sierra Nevada, however, remained largely uncharted. Spaniards made occasional forays into the upper San Joaquin Valley in pursuit of natives who had fled the forced labor imposed on them at coastal missions. Between 1804 and 1823 the Spanish made numerous trips into the Valley prospecting for new mission sites, attempting to recover stolen horses and cattle, or making punitive raids on the local natives believed responsible for the

theft of livestock. Chief among the Spanish explorers in the Central Valley was Pedro Fages, who led at least 46 explorations into the interior between 1805 and 1820. During his many expeditions he named the San Joaquin, Mariposa, Merced and Sacramento Rivers (Caughey 1940). Within the Sacramento Valley, Lieutenant Gabriel Moraga (Moraga 1808) and Jose Arguello, commander of the San Francisco Presidio (Arguello 1821) made independent forays. While Moraga's expedition was largely exploratory in nature, Arguello's expedition was intended to drive out foreign interlopers.

Subsequent to 1820, Spain's control over California grew ever more tenuous. Spain initiated secularization of California missions in 1813, and formally declared secularization in 1821 (Caughey 1940). That same year, Mexican forces prevailed in their struggle for independence from Spain and declared California part of the Mexican empire. This event marked the beginning of the short-lived Mexican Period in California history. Beginning in 1833, the Mexican Empire granted large land holdings, formerly mission lands, to native and naturalized Californians (known as Californios).

American presence in the interior of California spread in the decades after Jedediah Smith blazed an overland trail in 1826. By Smith opening a route to the interior of California, additional trappers and pioneers ventured into California's interior. Subsequent Euroamerican settlement of the region was enabled, in large part, by the introduction of exotic diseases that decimated the native populations of California.

While in Oregon on a fur trading expedition, John Sutter heard about California, specifically the Sacramento Valley. He decided to take a look at the area himself, arriving in Monterey by ship in 1839. In 1840 California's Mexican Governor Juan Bautista Alvarado granted Sutter 11 square leagues of land centered on the confluence of the American and Sacramento Rivers. Upon acceptance of the grant, Sutter set about establishing a fort located within the modern boundaries of Sacramento. By 1841, Sutter's Fort became a focal point for American overland migration as Sutter used his location to assist Sierra emigrant parties in trouble. He welcomed them when they arrived giving them provisions, work and selling them land.

In 1847 Sutter contracted with James Marshall to build a sawmill in the foothills to supply wood to the newly arriving immigrants. Marshall located the mill along the south fork of the American River near the Native American village of "Cullumah". On January 24, 1848, while inspecting the tailrace of the mill Marshall found gold, a discovery that would lead to the California Gold Rush.

The California Gold Rush, sparked by Marshall's discovery at Coloma in 1848, further fueled the decline of the native populations. As tens of thousands rushed to California, local indigenous populations were overwhelmed and displaced.

Gold Mining

The following information specific to gold mining in the Grass Valley Mining District is excerpted from Historic Context for Empire Mine Historic District (Selverston 2008). Refer to the referenced document for an exhaustive discussion of site-specific history.

> Prospectors from California and Oregon explored the region soon after Marshall's discovery was announced, and mining camps began to grow around the rich strikes by late 1849. Miners from all over the globe spread out across the Sierra Nevada in their continued quest for deeper and more dispersed deposits, adapting in many ways as time passed. Gold quartz eroding out of lode deposits was discovered locally in 1850, and Grass Valley began taking on the qualities of one of California's premier hard-rock mining districts. The industry in the Grass Valley area followed the booms and busts typical of gold mining in the West, but the workings of the Empire Mine Historic District consistently set the production standard for over a century. Empire Mine State Historic Park epitomizes the transition from Gold Rush-era mining to highly capitalized lode mining lasting to the mid-20th Century. Eight distinct eras define the dominant patterns across 11 decades of gold mining in the Sierra Nevada. General trends are described for each era, with specific examples provided to demonstrate how operations in the District articulated with important historical events. The substantial discussion associated with the four periods spanning 1850-1916 is further structured to organize the information clearly using the sub-headings political and legal trends, technological advances, Grass Valley Mining District activity, and Empire Mine Historic District activity (Selverston 2008).
>
> The news of abundant gold spread across the globe in a well-documented order: beginning locally in California; then to shipping ports across the Pacific; from Oregon to the Sandwich (Hawaiian) Islands and throughout Central and South America. Migrations of people from each place headed in turn to the poorly known, often uncharted mountains of California. James Marshall, who is credited with discovering gold at Sutter's Mill, is also given credit for being the first to pan along Deer Creek in the Nevada City area in 1848 (Hoover et al. 1990). By October 1848 David Stump, a Mr. Berry,

and another man came from the Willamette Valley in Oregon to the Grass Valley region, where they took a large amount of gold from Wolf Creek, about a mile east of town (Wells 1880). The company soon left, being unprepared to deal with the coming winter (Selverston 2008).

Less than a year after Stump and his friends had successfully mined there, a party of forty-niners tracking lost cattle along Wolf Creek rediscovered the area, naming it Grass Valley. Cabins began to be erected by late summer (Hoover et al. 1990). A company from Boston began mining in a ravine down Wolf Creek in September (Bean 1867). Boston Ravine, as it became known, and the creeks and gullies throughout the Grass Valley area were worked on a small scale in late 1849, and from then on placer diggings provided excellent returns until the era of quartz mining a decade later (Prisk 1895; Selverston 2008).

[In addition to the Stump party discovery,] in June of 1850, a German prospector stumbled upon outcroppings of gold-bearing quartz while collecting firewood on Gold Hill (Gudde 1975), above Boston Ravine. By October, George McKnight had located the Gold Hill ledge about 1 mile west of the Empire Mine, sparking statewide excitement (Bohakel 1980). A miner present that year recalled that Tom Cracklin was the first to discover the quartz ledge on Gold Hill in December (Morse 1927). Regardless, the flurry of quartz prospecting that followed led to many new discoveries, including Ophir Hill that same month (McQuiston 1986) (Selverston 2008).

By March of 1851, Grass Valley had quickly grown to 150 buildings, several stores, inns, and saloons; and three separate stamp mills were operating by May (Bohakel 1980; Gudde 1975; Poingdestre 1895) (Selverston 2008a). A sawmill was erected that fall in the young town of Grass Valley, and about 20 men braved the winter of 1849-1850 (Gudde 1975). “Most of that first winter’s gold seekers gravitated to the collection of log huts and canvas shanties that grew up in Boston Ravine” (Mann 1982) (Selverston 2008a).

The 20 forty-niners who camped out in Grass Valley emerged through the winter in early 1850 to a fresh wave of would-be placer miners. About 15 cabins, the first store, a hotel, and family were in town by the end of summer (Poingdestre 1895; Wells 1880). A transportation network quickly developed to service the gold-mining communities, with the Nevada City Road branching off the Truckee Trail in use by 1850 (Byrd 1992). Grass Valley and Nevada City

served as the trading centers at this time, catering to “a mercurial aggregate of young, single miners, centers populated largely by small merchants almost indistinguishable in age and attitude from their customers” (Mann 1982). As many gold seekers settled and developed families during this period, the population of California continued to grow from 225,000 in 1852 to 380,000 by 1860 (Jelinek 1999) (Selverston 2008).

[Early] Gold Rush placer miners-mostly inexperienced-used simple, traditional methods during this brief and chaotic period. Although Limbaugh (1999) reported miners employing pans, rockers, and sluice boxes in the rush of 1849, Rohe’s (1986) in-depth study on the origins and diffusion of placer methods confirms common use of only pans and rockers prior to 1850. Sonorans from Mexico were the first group in California with any practical mining experience. Trained miners from Europe and the United States did not begin to arrive until late 1849, in tandem with the arrival of various new mining methods (Rohe 1986). Miners quickly adapted to the region, experimenting with new methods as they pursued different types of gold deposits (Selverston 2008).

Picks and shovels, and pans made from metal, wood, and even woven baskets, were the most common tools during the Gold Rush. “A good day’s work for a placer miner under medium conditions is 100 pans of dirt in 10 hours” (Wilson 1907). Water’s ability to separate less-dense material from free gold made it virtually essential for placer mining. Rockers were popular and highly portable placer devices during the Gold Rush. They used a punched metal plate to screen out large rocks, and an apron and cleats or riffles along a trough to capture gold when water was ladled in and the device rocked. Gold had to be cleaned out from behind the cleats and all of the waste material had to be dumped frequently (Selverston 2008).

The all-time record of gold production in California occurred in 1852, weighing in at over 3.9 million fine ounces (Clark 1979). This entire period, however, is characterized by annual production nearly as large (Selverston 2008a). [Despite this production, a] minor nationwide economic depression from 1856 until 1860 encouraged many to continue placer mining, even though the work was becoming far more complicated than panning or rocking. Increases in gold mining consistently occur during slow economic cycles. Mining slowed during the Civil War, dropping below 2 million fine ounces for the first time since production was accurately

measured, and under 1 million by 1865 (Clark 1979). The decline resulted as much from depleted placers as from miners leaving the goldfields to join in the conflict. Census population schedules illustrate the numerical dominance of miners in California during early statehood: miners comprised 75 and 38 percent of the workingmen in the population totals for 1850 and 1860, respectively (Cornford 1999). The declining numbers of miners in the population illustrates the draw to other strikes, other occupations, or simply giving up and returning home. In Grass Valley, however, the influence of gold mining in the community was moving in the other direction, from 71 percent of the population engaged in mining in 1850 to 76 percent in 1860 (Mann 1982). The town was becoming a hard-rock mining town (Selverston 2008).

While other techniques were gaining importance, simple placer mining endured throughout this period. As with the initial couple of years during the Gold Rush, the bulk of wealth was produced by sustained numbers of placer miners. Surface placers lasted until about 1855, after which river mining accounted for much of the state's production until the early 1860s (Clark 1979). Miners quickly turned to long toms for processing stream banks once the active bars were exhausted. A long tom operated essentially the same way as a rocker, although a constant stream of water had to be conveyed to one end of the long wooden trough. Dirt and gravel was added and reduced as it was carried down the trough by flowing water to a punched metal plate where only the finer material entered a sluice box below. Edwin F. Morse used this type of device to work his claim in Woodpecker Ravine during the winter of 1850-1851, describing living alone in a cabin there as a "lonesome existence on wild winter nights" (Morse 1927) (Selverston 2008).

The idea of enlarging the sluice box quickly gained popularity, and the troughs themselves were fitted with riffles of various types so they would collect gold instead of just reduce and screen soil. Sluice boxes could be strung together and material dumped in, or they could be positioned at the end of a channel so the ground could be caved into a stream of water flowing into a board sluice. Miners released gushes of water from a pond or reservoir to dislodge big chunks of ground, a technique called booming. A trough was carved into the ground or bedrock and lined with stones to act as riffles in some ground-sluice operations. Miners were using long toms by 1850 and impressive chains of sluice boxes containing mercury by 1851 (Lindström, Wells, and Wilson 2000; Rohe 1986) (Selverston 2008).

Expedient digging into stream banks, or “coyoting,” occurred in 1849, but true drift mining into substantial gravel beds and into deeply buried Tertiary deposits was not widespread until 1850 (Rohe 1986). Drifting took the form of haphazard coyoting or the more careful excavation of structured complexes of shafts and adits. The method required more planning, cooperation, knowledge, technology, and money than the vernacular name “coyoting” implies. Miners had to map Tertiary geology, excavate safe shafts that would not collapse, and move people, tools, and air in while hoisting out placer deposits (Mann 1982). The pay dirt taken out was wheel-barrowed to a sluice and processed. An area of extensive drifting near Nevada City came to be known as Coyoteville by the summer of 1850 (Gudde 1975). Tertiary deposits in the Union Hill portion of Empire Mine SHP were probably explored during this period (Selverston 2008a).

To expedite the removal and processing of large placer deposits, “a technology distinctly Californian in design and application” was developed (Limbaugh 1999). Hydraulicking-using a barrel, canvas hose, and nozzle-was introduced in 1853 (Pisani 1999). Edward Matteson from Connecticut was mining near Nevada City when he came up with the idea of forcing water under pressure through a nozzle to wash down stream banks into his sluice (Paul 1947). The concept was refined and improved over the next 30 years, at the end of which its use was regulated to control debris from clogging river systems. Remains and landscapes from large sluicing, coyoting, [and] small hydraulic operations are [present] throughout the Grass Valley Mining District. Historic maps (Lindgren 1896) depict “placer diggings” within the Park along South Fork Wolf Creek, Woodpecker Ravine, and Little Wolf Creek that probably represent these types of mining processes (Selverston 2008a). Though a profitable technique, debris from the process choked rivers downstream, causing flooding that ruined agricultural land and threatened heavily populated centers (Smith 1999). Nonetheless, hydraulicking dominated northern California mining until the federal courts decided in favor of emerging agricultural interests. The 1884 Sawyer Decision required mines to impound all debris (Selverston 2008). [The Sand Dam, located within the Park at Empire Mine, was later constructed in response to additional legislation that stemmed from the Sawyer Decision.]

Gold still embedded in exposed lode formations was discovered at the onset of [the early lode mining period]. Great quantities of

money were expended in the initial quartz rush to build tunnels, shafts, arrastras, and quartz mills, but generally investments did not pay off (Wells and Chambers 1882). The inexperience and the crudeness of early technology led to many disastrous failures, and quartz came into disfavor. Only a few had the energy and resources to continue developing lode mines (Wells 1880). Hand methods reigned, using hand-drills and black powder for extraction (Hardesty 1988). Men experienced at driving hand-held rods of steel into solid rock with a hammer-either alone, called single jacking, or in pairs, called double jacking-were highly valued. California mining historian Charles Bohakel (1980) described the division of labor by nationality: foreign immigrants filled most of the manual and underground work at quartz mines, while U.S. citizens typically operated the machinery (Selverston 2008).

The arrastra-which dragged a heavy object in a circular trough to crush and grind the ore-"was the only successful milling tool for quartz miners in the early days," although the Chili mill, which employed the crushing edge of a heavy wheel in a circular trough, was also used (Limbaugh 1999:39). There is evidence that although this technology was a better method than stamping, it was considered less efficient by investors because of its Hispanic origins (Van Bueren 2004). The first stamp mills were impractical, made from tree trunks capped in iron or using square stems and shoes that could not rotate to ensure even wear (McQuiston 1986:27). The first ore-crushing stamp mills in the district were of Cornish design, illustrating the early influence in the region by these experienced miners (Limbaugh 1999:38). The Cornish-influenced Grass Valley System used blankets to collect gold after stamping, and became widely used in many mining districts (McQuiston 1986:27) (Selverston 2008).

The rapid rise of lode [or hard rock] mining throughout California between 1850 and 1852 collapsed, due in part to lack of experience and technology. These obstacles were eventually overcome in the 1860s, in large part by the continuous efforts in the Grass Valley Mining District (Limbaugh 1999:36). Cornish immigrants, bringing hard-rock mining experience and technology from the tin and copper mines of Cornwall, began to form a distinct community in Grass Valley. Groundwater in the mines was a constant problem that experienced Cornish miners helped overcome, with the first Cornish pump installed at the nearby Gold Hill Mine in 1855 (Limbaugh 1999:38). A local newspaper, The Grass Valley

National, confirmed on 5 November 1861 that most of the lode mining was carried out by the Cornish (Selverston 2008).

Empire Mine Company

The history of the various entities that would eventually be consolidated to become the Empire Mine Company is characterized by a series of successive periods of productivity, disruption, and technological advancement. The Empire Mine Company was incorporated in 1854 and would operate for nine years before a temporary closure occurred, in part, due to lack of water from drought and lack of labor due to competing forces of the Comstock in Nevada and conscription in the Union Army (Selverston 2009). Between 1854 and 1863 Empire Mine yielded 28,100 tons of gold quartz ore (McQuiston 1986, Selverston 2008).

During the same period, several adjacent or nearby mines were consolidated. In 1864, Captain Stephen W. Lee and Alex H. Houston purchased a controlling share of Empire Mining Company stock, thus uniting the company with several of the surrounding mines. By 1867, growing productivity at the mine and investment in the company allowed for technological advancement and construction of a state of the art, 30-stamp mill.

In 1869, William Bowers Bourn Sr., a San Francisco capitalist who had been buying stock for several years, acquired control of the Empire Mining Company (McQuiston 1986). By the end of 1871, the company built a 20-stamp mill of an advanced design that was more productive than the 30-stamp mill, which by this time had been destroyed by fire. By the end of 1873, the Empire Mining Company employed 80 miners and 11 men working at the 20-stamp mill (McQuiston 1986, Selverston 2008).

In 1874, William Bowers Bourn, Sr., died of a self-inflicted gunshot wound. His wife, Sarah Bourn, took control of the company, relying in large part on Jenks F. Nesmith for the mining operations. In 1878, 21 year-old William Jr., assumed control of the business. By that time, the known veins had been largely worked out and dewatering of the deep shafts came at considerable cost, thus reducing profitability. Consensus among company experts was that the mine should be abandoned, due to the high costs associated with mining at the required depths. Bourn Jr. disagreed, reorganized the company as the Original Empire Mill and Mining Company in 1879, and embarked on an exploration program. Following dewatering of the mine and discovery of a new vein, the Empire Mine was once again profitable by 1883 (McQuiston 1986, Steinfeld 1996).

By 1888, Bourn Jr. sold a controlling interest in all his holdings to James D. Hague (McQuiston 1986). Under new ownership, the Original Empire Mill and

Mining Company experienced years of diminishing return and operated at a loss before Bourn Jr. would re-emerge as a pivotal character in the mine's history. Having, once again, taken a controlling interest in the Original Empire Mill and Mining Company, Bourne reorganized it as the Empire Mines and Investment Company in 1899 (McQuiston 1986).

The years following the formation of the Empire Mines and Investment Company were productive and the mine was renovated, modernized, and more extensively explored (Selverston 2009). By 1900 the shaft had reached a depth of more than 3,000 feet on the incline. The first decade of the 20th century continued to be profitable for the Empire Mines and Investment Company, allowing for the construction of an advanced cyanide plant in 1910. The company acquired additional holdings during this period and undertook a refurbishing of the mine workings (1913-1914). The Empire Mines and Investment Company holdings had grown to 600 acres by 1918. The following year labor tensions came to the fore as inflation diminished the value of wages. Such tensions were no doubt inflamed by the growing modernization in regional mines, such as the installation of subterranean electric train to deliver ore from the Pennsylvania Mine to the Empire Mill.

Bourn suffered a debilitating stroke in 1922. Following the death of his only daughter in 1929, he sold his interests to Empire Star Mines Company, Ltd. (Empire Star), marking the end of 52 years of family ownership (McQuiston 1986). Almost simultaneously, Empire Star acquired certain mining assets of North Star Mining Company, thus consolidating the Empire and North Star Mines under one owner. At the time of its formation in 1929, Empire Star was 51% owned by Newmont Empire Mining Company, a subsidiary of Newmont Mining Company.

The Great Depression had a negligible impact upon the operations, as Empire-Star Mines Company continued to acquire and develop additional mineral holdings. By 1930, the Empire-Star Mines Company was the number one gold producer in California. This merger incorporated other important mines in the area, and from 1920 to 1941 the district was enormously productive, employing nearly 4,000 miners. From 1929 to 1954, Empire-Star Mines Company increased the depth of the Empire Mine and added additional mine holdings in and around Grass Valley and Nevada City (McQuiston 1986, Selverston 2008).

The Gold Reserve Act of 1934 strengthened the reliance on U.S. currency notes over gold, allowing the country to regain a gold standard. The rising value of gold led to a resurgence in mining in the area that lasted from 1936 until 1941. The mines were shut down during World War II and reopened soon afterward, but with decreasing productivity. The Empire-Star Mines Company, one of the largest operators, closed in 1957. In 1958, the entire holdings of Empire-Star

Mines Company were sold at public auction, and it took until December of 1961 for the last vestiges of the company to be liquidated and for the last remaining employees to leave the premises. Eight years later, in 1969, the headframe was identified as a safety hazard and demolished [prior to DPR's acquisition of the Park] (McQuiston 1986, Selverston 2008).

In 1974, DPR acquired 770 acres of land for the creation of the Park. The $1.43 million acquisition included the former Empire-Star Mines Company holdings such as all standing buildings, structures and the remnants of mining operations that spanned over 100 years. The purchase price, however, excluded mineral rights up to 250 feet deep in some places. In the spring of 1975, the property, at that time named Empire Mine State Park, became an official unit of the State Park System. DPR reclassified the unit as a state historic park in 1976 and nominated it for listing on the NRHP [National Register of Historic Places]. The areas of significance noted on the nomination are identified as historic archaeology, architecture, and industry. The nomination focused on the historic architecture and buildings within the Park unit, but also elaborated on the continuous mining operations from 1850-1956 (DPR 1978). The ASC is currently updating the nomination to include all of the contributing resources identified during the 2008 inventory (Selverston 2008b).

Empire Mine Mining and Processing

Gold ore at the Empire Mine occurred primarily in deep quartz veins, requiring underground hardrock mining techniques. Miners drilled and blasted shafts deep into the ground to provide access to the ore-bearing quartz veins. Ore extraction included both manual techniques and blasting, after which ore was hauled to the surface and crushed at which point the gold was separated from the ore through various methods (see below), refined, and poured into molds.

Stamp mills crushed the ore into sand-size particles; the resulting sand was mixed with water creating a fine pulp or slurry. The slurry oozed onto long copper plates, referred to as amalgamation tables and then continued through an amalgamation process. As amalgamation techniques changed, workers at the mine used various chemicals to aid in gold extraction (i.e., mercury, chlorine, and cyanide).

Final gold refining followed amalgamation, with specific refining methods dependent on the amalgamation process. When a mercury or chlorination amalgamation process was used, the amalgam was placed in a closed retort (similar to a still) and heated, thus vaporizing the mercury which condensed in cooling tubes and for later reuse. Gold left behind was called a "sponge," because of the many small holes where the mercury had been. If a cyanide amalgamation process was used, the precipitate was placed in huge furnaces

and heated to a molten state, then poured into iron crucibles and allowed to cool. As the molten mixture cooled, the gold settled to the bottom of the crucible while other metals and impurities (slag) rose to the top. Once the mixture became a solid mass it was dumped out and the slag was knocked loose from the gold with a sledge hammer.

The final refining process remained the same irrespective of the amalgamation process used. The gold was carefully weighed and then placed in the bullion furnace where it was melted once again and poured into ingots weighing 1,000 troy ounces. The subsequent steps in the process include a final assay for purity, labeling, and shipping to the U.S. Mint in San Francisco.

4.4.2 Regulatory Setting

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historic, architectural, archaeological, cultural, and/or scientific importance. The following discussion summarizes the pertinent cultural resource regulatory framework that the Project is subject to.

4.4.2.1 Federal

National Historic Preservation Act

The proposed project would be subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) in the event that it requires a Section 404 permit, pursuant to the Clean Water Act. Section 106 of the NHPA, as amended, and its implementing regulations found in 36 Code of Federal Regulations (CFR) Part 800, require federal agencies (U.S. Army Corps of Engineers if a 404 permit is issued) to identify Historic Properties that may be affected by actions involving federal land, funds, approval or permitting. If a resource is determined to be a Historic Property, Section 106 of the NHPA requires that effects of a proposed undertaking on the resource be determined. If a Historic Property would be adversely affected by an undertaking, then prudent and feasible measures to avoid or reduce adverse impacts must be taken. The State Historic Preservation Officer (SHPO) must be provided an opportunity to review and comment on these measures prior to project implementation.

National Register of Historic Places

The National Register of Historic Places (NRHP) was authorized by the NHPA and serves as the nation's official list of cultural resources worthy of preservation. Moreover, the NRHP forms a core element of a coordinated national effort to identify, evaluate, and protect resources that meet the criteria of Historic

Properties, as defined below. The Park, which is replete with significant cultural resources, is listed on the NRHP and is therefore considered a Historic Property.

The criteria for listing on the NRHP, defined in 36 CFR 60.4, are as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history;
> B. That are associated with the lives of persons significant in our past;
> C. 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; or
> D. That have yielded, or may be likely to yield, information important to prehistory or history.

In addition to meeting at least one of the criteria listed above, a resource must also retain enough integrity to enable it to convey its historic significance. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity (NPS, 1990). These seven elements of integrity are: location, design, setting, materials, workmanship, feeling, and association. To retain integrity, a property will always possess several, and usually most, of these aspects.

While most historic buildings and many historic archaeological properties are significant because of their association with important events, people, or styles (criteria A, B, and C), the significance of most prehistoric and some historic-period archaeological properties are usually assessed under criterion D (above). This criterion stresses the importance of the information contained in an archaeological site, rather than its intrinsic value as a surviving example of a type or its historical association with an important person or event.

4.4.2.2 State

California Environmental Quality Act and Public Resource Code

The California Environmental Quality Act (CEQA) requires that, for projects financed by, or requiring the discretionary approval of public agencies in California, the effects that a project has on historical and unique archaeological resources must be considered (Public Resources Code [PRC] Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201).

The CEQA Guidelines (Section 15064.5) define three cases in which a property may qualify as a historic resource for the purpose of CEQA review (A through C):

A. The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR). The CRHR is a statewide list of Historical Resources with qualities assessed significant in the context of the state's heritage. The CRHR functions as an authoritative guide that is intended to be used by state and local agencies to indicate types of cultural resources that require protection, to a prudent and feasible extent, from project-related substantial adverse changes. Properties that are listed in the NRHP, or are eligible for listing, are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC Section 5024.1(d)(1)). As previously noted, the Park is listed on the NRHP, and thus, is eligible for listing in the CRHR. While certain historic features located in the Park might not qualify as contributing elements of the Empire Mine Historic District, they could have local or state significance and be eligible singularly, or collectively, to the CRHR.

   Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:

   1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
   2. Is associated with the lives of persons important in our past;
   3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
   4. Has yielded, or may be likely to yield, information important in prehistory or history.

As with the NRHP, properties must retain integrity to be eligible for listing on the CRHR.

B. The resource is included in a local register of historic resources, as defined in section 5020.1(k) of the PRC, or is identified as significant in a historical resources survey that meets the requirements of section 5024.1(g) of the PRC (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant). The Park also meets this criterion, having been listed as a California State Landmark (No. 298).

C. The lead agency determines that the resource may be a historical resource as defined in PRC section 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record.

PRC Section 21083.2 governs the treatment of *unique archaeological resources*, which must be afforded consideration in the assessment of impacts under CEQA. A unique archaeological resource is defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated" as meeting any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
2. Has a special and particular quality such as being the oldest of its type or the best example of its type; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

As defined by the California State Health and Safety Code, Section 7050.5, and PRC Section 5097.98, the inadvertent discovery of human remains requires cessation of project work relative to the find until an assessment of the remains, including determination of origin and deposition, is completed by the County Coroner, in consultation with the Native American Heritage Commission (NAHC) and/or appropriate Tribal representative(s). In the event of inadvertent discoveries, an on-going program of Native American consultation provides an opportunity for such groups to participate in the identification, evaluation, and mitigation of impacts to human remains and funerary objects.

When a project will affect state-owned historical resources, as described in PRC Section 5024, and the lead agency is a state agency, the lead agency will consult

with the California State Historic Preservation Officer prior to approval of a proposed project (14 California Code of Regulations [14 CCR] §15064.5(b) (5)).

Executive Order W-26-92

As of June 30, 2007, DPR controls and administers 258 classified units and 20 major unclassified properties for a total of 278 areas, which collectively contain thousands of historic resources. Executive Order W-26-92 requires all state agencies, including DPR, in furtherance of the purposes and policies of the state's environmental protection laws and historic resource preservation laws, to the extent prudent and feasible within existing budget and personnel resources, to preserve and maintain the significant heritage (cultural and historical) resources of the state. Each state agency, including DPR, is directed to:

1. Administer the cultural and historic properties under its control in a spirit of stewardship and trusteeship for future generations;
2. Initiate measures necessary to direct its policies, plans, and programs in such a way that state-owned sites, structures, and objects of historical, architectural, or archeological significance are preserved, restored, and maintained for the inspiration and benefit of the people;
3. Ensure the protection of significant heritage resources are given full consideration in all of its land use and capital outlay decisions; and
4. Institute procedures to ensure that state plans and programs that contribute to the preservation and enhancement of significant non-state owned heritage resources in consultation with OHP (*Executive Order W-26-92* Section 1).

4.4.3 THRESHOLDS OF SIGNIFICANCE

CEQA requires that all state funded or approved projects (including those implemented by state agencies) that have the potential to result in a substantial adverse change to Historic Resources must consider alternative plans and/or measures for mitigation. The following thresholds have been prepared based on the State CEQA Guidelines Section 15064.5 and Appendix G. The Project would have a significant impact on cultural resources if it:

- Causes a substantial adverse change in the significance of a historic resource as defined in §15064.5;
- Causes a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5; or
- Disturbs any human remains, including those interred outside of formal cemeteries.

4.4.4 Environmental Impacts and Mitigation Measures

As the preceding sections demonstrate, significant cultural resources are distributed throughout the Park, which have the potential to be impacted by the Project and associated Program Actions described in Section 2.0. Impacts that could result from Program Actions are considered at two levels in the following analysis: at a general, programmatic level that considers the four broad categories of actions (characterization, evaluation, interim actions, and remediation options) that could potentially be applied across a broad area of the Park; and at a site-specific level, considering a broadly-defined range of possible actions at 10 locations within the Park. If Program Actions are proposed beyond the suite of remediation options provided in Section 2.6.3 of this Draft PEIR, DPR will independently assess potential impacts of those measures and prepare the appropriate subsequent environmental documentation.

4.4.4.1 Programmatic EIR Impact Assessment

This section provides a cultural resource impact assessment at a programmatic level, that considers potential impacts associated with characterization, evaluation, interim actions, and remediation options throughout the Park. To identify potentially significant impacts resulting from the Project, each of the four proposed Program Actions was assessed against the significance thresholds discussed above in Section 4.4.4. Table 4.4-3 summarizes the results of the impact analysis and identifies the significance of reasonably foreseeable impacts that could occur to cultural resources within the Park.

TABLE 4.4-3
PROGRAM EIR CULTURAL RESOURCES IMPACT ANALYSIS

Remediation Actions	Thresholds of Significance		
	Substantial adverse change in the significance of a historic resource	Substantial adverse change in the significance of an archaeological resource	Disturbs any human remains, including those interred outside of formal cemeteries
CHARACTERIZATION			
Characterization(e.g., soil sampling)	LS	LS	LS
EVALUATION			
Evaluation (e.g., bench scale testing)	LS	LS	LS
INTERIM ACTIONS			
Fences	PS	LS	LS
Signs	PS	LS	LS
Installation of Zeolite Treatment Cells	LS	LS	LS
Installation of Straw Wattles	LS	LS	NI
Use of Soil Tackifiers/Binding Agents	LS	LS	NI
Construction of a temporary Water Treatment Plant at the Magenta Drain Area	PSU	PSU	LS
REMEDIATION OPTIONS			
In-situ Establishment and Stabilization	PSU	PSU	LS
Selective Removal and/or Replacement of Surface Materials	PSU	PSU	LS
Complete Removal and/or Replacement of Surface Materials	PSU	PSU	LS
Placement of Removed Soils or Materials within the Park	PSU	PSU	LS
Placement of Cover over Selected Areas	PSU	LS	LS
Maintenance and Enhancement of Existing Cover	LS	LS	LS
Use of Engineered Controls to Prevent Access	LS	LS	LS
Use of Institutional Controls	PSU	PSU	LS
Implement Active Treatment Measures	PSU	PSU	LS
Implement Passive Treatment Measures	PSU	PSU	LS
Stormwater Collection and Diversion Structures	PSU	PSU	LS
Other Water Management Measures	LS	LS	LS
Remediation of Structures	PSU	PSU	LS

Notes: *NI = No Impact; LS = Less than Significant; PS = Potentially Significant, PSU =Potentially Significant and Unavoidable

Impact 4.4-1: Program Actions Could Cause a Substantial Adverse Change in the Significance of a Historic Resource Pursuant to CCR §15064.5

As indicated in Table 4.4-3, three of the four Program Actions associated with the Project (characterization, interim actions, and remediation options) have the potential to cause a substantial adverse change in the significance of a historic resource. The potential for an impact is dependent on the location of remediation activities within the Park. At the Program level, it is not feasible to determine if specific impacts to historic resources can be reduced to a less than significant level given the lack of specific information concerning the exact location and nature of program activities.

The following Project Actions could potentially have significant impacts on historic resources:

- Operation of heavy construction equipment;
- Mobilization and demobilization of heavy construction equipment to the Park;
- Demolition and/or removal of any structures, including temporary facilities;
- Grading activities;
- Boring activities;
- Excavation activities;
- Blasting activities;
- Scarifying activities;
- Stormwater BMP installation and maintenance activities;
- Physical contact with cultural and surface water resources;
- Construction of ancillary structures, including utilities for either a temporary or permanent active water treatment facility;
- Construction and installation of permanent exclusion barriers;
- Construction and maintenance of access roads; and/or
- Monitoring activities.

However, DPR has incorporated several Project Requirements into Program Actions to lessen potential impacts.

Standard Project Requirement CULT-1 requires that prior to the start of Project Actions, and to the extent already completed, a DPR-qualified cultural resources specialist will map and record all historic features within the proposed Remediation Area to a level appropriate to Secretary of Interior Standards.

Standard Project Requirement CULT-2 requires that prior to the start of Program Actions, a DPR-qualified cultural resources specialist will train field personnel in cultural resource identification and protection procedures.

Per Standard Project Requirement CULT-3, prior to the start of Program Actions, and at the discretion of a DPR-qualified cultural resources specialist, the Project Proponents will flag and/or fence all cultural resources within 15 feet of Program Actions for avoidance within the Remediation Area. This fencing will be removed after remediation has been completed. CULT-3 further states that, at the discretion of a DPR-qualified cultural resources specialist, all Program Actions could be monitored. The Project Proponents will notify the Northern Service Center Cultural Resource Section a minimum of three weeks prior to the start of Program Actions to schedule monitoring, unless other arrangements are made in advance.

Additionally, CULT-3 requires that if intact cultural features are uncovered during Program Actions, work will be temporarily halted and diverted to another location until the DPR-qualified cultural resources specialist records and evaluates the find, and implements avoidance, preservation, or recovery measures. If avoidance is required, the Project Proponents will modify Program Actions to avoid the cultural resources. The proposed modified Program Actions will be implemented upon review and approval of a DPR-qualified cultural resource specialist and DTSC and/or RWQCB.

Standard Project Requirement CULT-4 states that in the event that the DPR-qualified cultural resources specialist determines that potentially significant, previously undocumented/unflagged cultural resources (including but not limited to dark soil containing shellfish, bone, flaked stone, groundstone, or deposits of historic material) are encountered during Program Actions, all work in that location will be temporarily halted and diverted to another location, until DPR's State Representative is contacted. CULT-4 further requires that the DPR-qualified cultural resource specialist will record and evaluate the find and work with the Project Proponents to implement avoidance, preservation, or recovery measures, as appropriate, prior to any work resuming at that specific location.

Per CULT-4, in the event that previously undocumented cultural resources are encountered during Project implementation and a DPR-qualified cultural resources specialist is not on-site, the DPR State Representative will be contacted immediately and work within the immediate vicinity of the find will be temporarily halted or diverted until a DPR-qualified cultural resources specialist evaluates the find and determines the appropriate treatment and disposition of the cultural resource.

CULT-4 additionally requires, that prior to the start of Program Actions, a DPR-qualified cultural resources specialist will prepare a Construction Monitoring and Unanticipated Discovery Response Plan (CMUDRP) to be implemented if an unanticipated discovery is made. CULT-4 requires that elements of the CMUDRP include the following:

implementation of worker and supervisor response procedures to be followed in the event of an unanticipated discovery, including appropriate points of contact for professionals qualified to make decisions regarding the potential significance of any find; identification of, and on-call contact information for, persons authorized to stop or redirect work that could affect the discovery; provisions for monitoring of Project Actions in resource-sensitive areas; stipulations of a minimum radius around any discovery within which construction work will be temporarily halted until the significance of the resource has been evaluated and implementation of avoidance, preservation, or recovery measures, as appropriate; and consultation procedures for contacting identified Native Americans, as appropriate.

Standard Project Requirement CULT-5 states that in the event that human remains are discovered during Program Actions, all work at that location will be temporarily halted and diverted to another location. Any human remains and/or funerary objects will be left in place. CULT-5 requires that the Project Proponents contact the DPR State Representative as soon as possible who will then immediately contact the DPR Sector Superintendent. The DPR Sector Superintendent (or authorized representative) will notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) will be notified within 24 hours of the discovery if the Coroner determines that the remains are Native American. The NAHC will designate the “Most Likely Descendent” (MLD) of the deceased Native American. The MLD will recommend an appropriate disposition of the remains. If a Native American monitor is at the Park at the time of the discovery, and that person has been designated the MLD by the NAHC, the monitor will make the recommendation of the appropriate disposition.

Per CULT-5, work will not resume in the area of the find until proper disposition is complete (PRC §5097.98). No human remains or funerary objects will be cleaned, photographed, analyzed, or removed from the site prior to determination. If it is determined the find indicates a sacred or religious site, the site will be avoided to the maximum extent practicable.

Standard Project Requirement CULT-6 requires that the Project Proponents conduct all rehabilitation, restoration, preservation, or reconstruction of a historic resource in a manner consistent with the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995).

Pursuant to Standard Project Requirement CULT-7, prior to the construction of permanent project components at the Park, the Project Proponents will consult with a DPR-qualified cultural resources specialist for review and modification to avoid impacting the integrity of setting of significant historic features within the Park.

The Standard Project Requirements discussed above could reduce the Project's potential impacts to a less than significant level. However, the Project's impacts must be considered potentially significant and unavoidable for the following reasons:

- The Remediation Areas in the Park where Program Actions will be implemented are known to contain significant historic resources;
- The full scope and nature of the Project's potential impacts to significant resources cannot be determined at this time without the benefit of a comprehensive and detailed remediation plan; and
- It is not certain that all potential impacts can be mitigated to a less than significant level. If mitigable, it is not known if the required mitigation would be feasible or enforceable, as defined under CEQA.

Level of Significance Before Mitigation: Potentially Significant

Mitigation Measures: Mitigation Measure 4.4-1: Thorough Recording of Significant Historic Features

In the event that historic features will be subject to direct or indirect impacts related to a Project Action, a program of thorough feature recordation will be implemented. Feature recording will employ all means necessary, including mapping, photo-documentation, and integration of the data into the existing GIS database to document the extant character and condition of said features.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

Impact 4.4-2: Program Actions Could Cause a Substantial Adverse Change in the Significance of an Archaeological Resource Pursuant to CCR §15064.5

One prehistoric archaeological site, consisting of a bedrock milling feature, has been documented within the confines of the Park. Pursuant to Standard Project Requirement CULT-3, the prehistoric archaeological site will be flagged and avoided during Project implementation and will not be impacted.

The fact that only one prehistoric archaeological site has been documented in the Park by no means establishes the absence of other, previously undiscovered, prehistoric archaeological resources within the Park. The historic land uses documented within the Park likely buried or otherwise obscured additional prehistoric resources. Moreover, archaeological resources dated to the historic period could also lie undocumented within the Park. Thus, Program Actions such as characterization, interim actions and remediation actions have the potential to significantly impact previously undocumented sites by causing damage, destruction, or removal of physical components.

The following Project Actions could potentially have significant impacts on previously undocumented archaeological resources:

- Operation of heavy construction equipment;
- Demolition and/or removal of any structures, including temporary facilities;
- Temporary and permanent fencing installation;
- Grading activities;
- Boring activities;
- Excavation activities;
- Blasting activities;
- Scarifying activities;
- Planting and seeding activities;
- Dredging and sediment removal;
- Stormwater BMP installation and maintenance activities;
- Physical contact with cultural and surface water resources;
- Removal of trees and other vegetation;
- Construction of ancillary structures, including utilities for either a temporary or permanent active water treatment facility;
- Construction and installation of permanent exclusion barriers;
- Construction and maintenance of access roads; and/or
- Monitoring activities.

Standard Project Requirement CULT-3, discussed in detail above, will provide for the protection of the previously identified archaeological site, such that potential impacts would not occur. Standard Project Requirement CULT-4 provides protocols to follow in the event of an inadvertent discovery of archaeological constituents in the course of Program Actions. Adherence to the above referenced Standard Project Requirements would significantly reduce potential impacts to archaeological resources located within the Park. The following mitigation measure will compliment the Standard Project Requirements and could reduce all potential impacts to a less than significant level.

Level of Significance Before Mitigation: Potentially Significant

Mitigation Measures: Mitigation Measure 4.4-2

In conjunction with Standard Project Requirement CULT-4, if such resources cannot be avoided or preserved in-place, the Project Proponents will initiate a data recovery investigation to provide for the collection of a scientifically consequential sample of the deposit. Data recovery will include a comprehensive

Research Design, which identifies the scope of the investigation, methods to be used, and research objectives. Implementation of the data recovery investigation will occur prior to resumption, or in conjunction with, the proposed Program Actions, as determined by the designated DPR-qualified cultural resources specialist.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

Impact 4.4-3: Program Actions Could Disturb Human Remains, Including Those Interred Outside of Formal Cemeteries

Previous archaeological work and field survey completed for the proposed project failed to identify any cemeteries or human remains at the Park. As previously noted, historic landscape alterations could have obscured such sites. However, the high rate of precipitation and acidity of the soil in the Sierra Nevada tends to rapidly decay organic materials, such that the possibility of encountering human remains is extremely remote (United States Department of Agriculture, Soil Conservation Service and Forest Service [USDA, SCS & FS] 1974:10, 75, 83).

In the unlikely event that Program Actions result in an inadvertent discovery of human remains, DPR will ensure compliance with Standard Project Requirement CULT-5. Impact 4.4.-1 describes the requirements of Standard Project Requirement CULT-5.

Level of Significance Before Mitigation: Less than Significant

Mitigation Measures: None Required

4.4.4.2 Area-Specific Impact Assessment

To identify potentially significant impacts resulting from the Project, each proposed Program Action was assessed for each Remediation Area using the significance thresholds listed in Section 4.4.4, Thresholds of Significance. Table 4.4-4, Area-Specific Cultural Resources Impacts Analysis, summarizes the Area-specific cultural resource impacts.

TABLE 4.4-4
AREA-SPECIFIC CULTURAL RESOURCES IMPACT ANALYSIS

Remediation Areas	Thresholds of Significance		
	Substantial adverse change in the significance of a historic resource	Substantial adverse change in the significance of an archaeological resource	Disturbs any human remains, including those interred outside of formal cemeteries
Area 1: Mine Yard and Stamp Mill Area	PSU	PSU	LS
Area 2: Cyanide Plant Area	PSU	PSU	LS
Area 3: Conveyance Corridor and Adit Project	PSU	PSU	LS
Area 4: Sand Dam Area	PSU	PSU	LS
Area 5: Historic Mine and Mill Sites	PSU	PSU	LS
Area 6: Magenta Drain Area	PSU	PSU	LS
Area 7: Stacy Lane Pond Area	PSU	PSU	LS
Area 8: Historic Grounds Area	PSU	PSU	LS
Area 9: Residences and Residences' Yards	PSU	PSU	LS
Area 10: Trails	PSU	PSU	LS

Notes: *NI = No Impact; LS = Less than Significant; PS = Potentially Significant; PSU = Potentially Significant and Unavoidable

Impact 4.4-4: Program Actions Could Cause a Substantial Adverse Change in the Significance of a Historic Resource as Defined in CCR §15064.5 at One or More Remediation Areas

Based on the results of Selverston (2008a and 2008b), DPR has determined that there is a reasonable likelihood that all 10 Remediation Areas have significant cultural resources located within their respective boundaries. For Remediation Areas 3, 5, 7, 8, 9 and 10, the programmatic approach sufficiently analyzes potential impacts. However, additional evaluation and mitigation could be required for Areas 1, 2, 4, and 6.

A Program Action proposed for Area 1 that has the potential to impact cultural resources is the replacement or coating of corrugated metal roofs on historic buildings. The Program Action is intended to eliminate leaching of zinc from the roofs of historic buildings located in Area 1. Installation of zeolite treatment cells in storm drains within Area 1 is proposed as an interim action, yet would not impact cultural resources. Replacement of the existing metal corrugated roofs, or coating with a substance to sequester the leaching zinc, have the potential to adversely impact the integrity of the subject historic buildings and impair the visual character of the historic district. Pursuant to Standard Project Requirement CULT-1, a DPR qualified cultural resource specialist

will map and record all historic features within Area 1 to a level appropriate to SOI Standards. Standard Project Requirement CULT-6 will be implemented, which requires all rehabilitation, restoration, preservation, or reconstruction of a historic resource to be done in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995). The selection of materials used in the roof replacement or coating will be undertaken in consultation with the designated DPR-qualified Cultural Resources Specialist, pursuant to Standard Project Requirement CULT-7. If it is not possible to find a suitable roofing replacement that is in keeping with the SOI Standards, then Mitigation Measure 4.4-1 will be implemented. Due to the fact that the ultimate feasibility of treatment in accordance with Standard Project Requirement CULT-6 is not certain, in addition to the fact that Mitigation Measure 4.4-1 would not reduce the impact to a less than significant level, this impact is considered potentially significantly unavoidable.

Area 2, the Cyanide Plant Area, would be subject to Program Actions designed to reduce unacceptable risk of COC to humans and the environment. Remediation for this area could include (but may not be limited to) the construction of a roof over the Cyanide Plant. This remediation strategy has the potential to adversely impact the integrity of the Cyanide Plant building and impair the visual character of the historic district. Moreover, installation of a free-standing roof above the Cyanide Plant has the potential to disturb and impact portions of the Plant foundation that are below surface. Pursuant to Standard Project Requirement CULT-1, a DPR-qualified cultural resource specialist will map and record all historic features within Area 2 to a level appropriate to SOI Standards. In compliance with Standard Project Requirement CULT-3 a DPR-qualified cultural resource specialist with flag or otherwise demarcate areas to be avoided (inclusive of any buffer) by all excavation and construction. Standard Project Requirement CULT-6 will be implemented prior to any construction within Area 2, which requires that maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of a historic resource is undertaken in a manner consistent with the SOI's Standards, as described above. Monitoring of all excavation around the Cyanide Plant will be required, pursuant to Standard Project Requirement CULT-4. Additionally, the selection of materials used in the roof and supporting structure will be undertaken in consultation with the designated DPR-qualified Cultural Resources Specialist, pursuant to Standard Project Requirement CULT-7. In conjunction with the above referenced Standard Project Requirements, Mitigation Measure 4.4-1 (thorough recordation prior to alterations) will be implemented. Implementation of the above referenced Standard Project Requirements and mitigation measure will reduce the intensity of impacts associated with constructing a roof over the Cyanide Plant, yet not to a less than significant level. As such, this impact is considered potentially significantly unavoidable.

A range of remediation options that could be implemented in the Sand Dam Area (Area 4) is currently under consideration. One such option is the complete removal of the

Sand Dam, which is a contributing element of the Empire Mine Historic District. Loss of the Sand Dam would impact the integrity of the Historic District. Pursuant to Standard Project Requirement CULT-1, a DPR-qualified cultural resource specialist will map and record all historic features within Area 4 to a level appropriate to SOI Standards. Implementation of Mitigation Measure 4.4-1, which requires mapping, photo-documentation, and integration of the data into the existing GIS database of impacted features, would decrease the severity of the impact, but not to a less than significant level. Therefore, removal of the Sand Dam would constitute a potentially significant and unavoidable impact.

Program Actions under consideration for the Magenta Drain Area (Area 6) include the use of engineered controls to restrict access and implementation of passive and active treatment measures, among others. Specifically, a water treatment plant could be constructed in this area, which is known to contain features that contribute to the significance of the Empire Mine Historic District. Construction of this facility has the potential to physically impact significant resources, as well as impact the integrity of the Empire Mine Historic District by altering the setting. Implementation of Standard Project Requirements CULT-1, 3, 6, and 7, discussed above, in conjunction with Mitigation Measure 4.4-1, could reduce potential impacts to a less than significant level. However, given the lack of specifics with respect to the exact nature and location of the water treatment plant, this impact is considered potentially significant and unavoidable.

The Standard Project Requirements provided in the Programmatic Approach, and described under Impacts 4.4-1 through 4.4-3, above, will be implemented prior to Program Actions at each of the Remediation Areas. The Standard and Specific Project Requirements could reduce the Project's potential impacts to a less than significant level in Areas 3, 5, 7, 8, 9 and 10. However, the Project's impacts are considered potentially significant and unavoidable within Areas 1, 2, 4, and 6 for the following reasons:

- The Remediation Areas in the Park where Program Actions will be implemented are known to contain significant historic resources;
- Program Actions could potentially have significant impacts on these historic resources;
- The full scope and nature of the Project's potential impacts to significant resources cannot be determined at this time without the benefit of a comprehensive and detailed remediation plan; and
- It is not certain that all potential impacts can be mitigated to a less than significant level. If mitigable, it is not known if the required mitigation would be feasible or enforceable, as defined under CEQA.

Level of Significance Before Mitigation: Potentially Significant

Mitigation Measure 4.4-1: Exhaustive Recording of Significant Historic Features

See Mitigation 4.4-1, above.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

4.4.5 EFFECTS CONSIDERED NO IMPACT OR LESS THAN SIGNIFICANT WITHOUT PROJECT REQUIREMENTS

No impacts have been identified as no impact or less than significant. All cultural resource CEQA thresholds are addressed in Impacts 4.4-1 through 4.4-4, above.

4.4.6 FINDINGS

Program Actions could have a potentially significant and unavoidable impact to cultural resources located within the Park. As detailed above, Impacts 4.4-1, 4.4-2 and 4.4-4 are considered potentially significant and unavoidable for the following reasons:

- The exact location of Program Actions is not known at this time;
- The full scope and nature of Program Actions with potential impacts to significant cultural resources cannot be determined at this time without the benefit of a comprehensive and detailed remediation plan; and
- It is not certain that all potential impacts can be mitigated to a less than significant level. If mitigable, it is not known if the required mitigation would be feasible or enforceable, as defined under CEQA.

For a discussion of overriding consideration regarding the above findings, please see Section 6.0, Significance of Environmental Impacts.