

4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section discusses the potential impacts to cultural resources and paleontological resources from the proposed Project. Cultural resources include archaeological resources, traditional cultural properties, and historic architectural resources. Paleontological resources include fossil specimens, fossil sites, and fossil-bearing rock units.

SETTING

Regional Overview

Prehistoric Archaeological and Ethnographic Overview

The following overviews are taken from *A Cultural Resources Study for the Lake Herman Quarry Expansion Project EIR, Near Vallejo, Solano County, California* (Scher 2010a) and *A California Register of Historical Resources District Evaluation of the Brownlie Mercury Mining Complex, near Vallejo, Solano County, California* (Scher 2010b).

An analytic framework for the interpretation of the Bay area, including Solano County, prehistory is provided by Fredrickson (1974), who divided human history in California into three broad periods: the Paleoindian period, the Archaic period, and the Emergent period. This scheme used sociopolitical complexity, trade networks, population, and the introduction and variations of artifact types to differentiate between cultural units. This scheme, with minor revisions remains the dominant framework for prehistoric archaeological research in the region.

The earliest documented human occupation in California, the Paleoindian period (ca. 10,000-6000 B.C.), was a time of variable climate, rising sea levels, and other broad-scale environmental change. People lived in small, highly mobile groups, moving through broad geographic areas and leaving relatively meager archaeological remains.

With the more stable climate of the long Archaic period (6000 B.C. to A.D. 1000), people gradually became more sedentary, new groups entered the area, and regional distinctions developed. The Archaic has been divided into three subperiods (Lower, Middle, and Upper), based on changes in sociopolitical complexity, trade networks, populations, and the introduction of new artifact types. The addition of milling tools, obsidian and chert concave-base points, and occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the Upper Archaic period beginning around 500 B.C., mobility was being replaced by a more sedentary adaptation that included a reliance on intensive acorn processing and storage. Numerous small villages and the beginnings of a more complex society and economy characterize the end of this period.

During the Emergent, or Late, period (ca. A.D. 1000 to the historic period), social complexity developed toward the contact-period settlement pattern of large, central villages where political leaders resided, with associated hamlets and specialized activity sites. Innovations associated with the period include the bow and arrow, small corner-notched points, and a diversity of beads and ornaments.

Ethnographic literature indicates that at the time of historic contact, the project area was within the southwestern portion of the territory of the Patwin, a Wintuan-speaking people. The territory of the Patwin extends from the current location of the levee town of Princeton in the Sacramento Valley, south to the Montezuma Hills, west to Suisun Bay, and north to Chiles and Long valleys.

Precontact population for the greater region that includes Patwin, and their neighbors to the north, the Wintun, and Nomlaki tribes, is estimated at approximately 12,500. The Patwin were organized by tribelets, which consisted of one primary and several secondary villages. Major settlements were oriented to available water sources with reliable flows, although small camps were

established in drier areas during the seasonal rounds. The Patwin were a broad-based hunting, fishing and gathering society with most groups utilizing the acorn as a staple food. Many Patwin tribelets had good trading relationships with several other tribes, including Southern Pomo, Lake Miwok, Wappo, and Valley Maidu, although there were also disputes between both Patwin and other tribes as well as among Patwin tribelets. The nearest reported ethnographic village sites are Aguasto to the west of the project area and Tolenas to the east.

The Franciscans at Mission Dolores in San Francisco (1776) and later Mission San Francisco Solano in Sonoma (1823) drew converts from throughout the greater San Francisco Bay area, including Patwin territory. The Patwin culture was significantly impacted, both spiritually and physically, by European contact due to missionization, disease, and displacement. By 1972 the Bureau of Indian Affairs census listed only 11 Patwin individuals.

Historic Overview

Solano County gained its name from Chief Solano, a Suisun Wintun leader who first fought against and later befriended General Mariano Vallejo, the commandant of Sonoma. Vallejo himself was captured during the Bear Flag Revolt in 1846 at Sonoma and, while imprisoned, bargained for his release in part by ceding a portion of his Soscol grant to Dr. Robert Semple and Thomas Larkin, two participants in the revolt. Semple laid out plans for the city of Benicia that covered 2,100 acres, and in 1847, the town, named after Vallejo's wife, was created.

By 1850 the town of Benicia rivaled San Francisco as a northern California metropolis and port due to its strategic location between San Pablo and Suisun bays on the way to the California gold fields. The completion of the overland railroad in 1869 lessened the importance of Benicia as a port, but its use as a military base, along with the naval importance of Mare Island, kept economic investment in the town up into modern times.

Following the cessation of California from Mexico to the U.S. in 1848, General Vallejo urged the newly formed California legislature to move the state capital north from San Jose, and offered land for the construction of a capitol building, lodging, churches, schools, and other institutions. The legislature named the new city Vallejo after the town's benefactor.

The capitol was constructed by 1852, but Vallejo himself was unable to complete the promised infrastructure, and the legislators immediately moved the capital to Sacramento. Flooding in Sacramento that year pushed the capital back to Vallejo; the capital later shifted permanently to Sacramento in 1855.

The project area is part of the historic Sulphur Springs Mountain/Vallejo mining district. Mercury was used during the earliest days of the Gold Rush to recover gold on even the smallest of placer claim. This district operated from 1852 to 1943, with mercury mining reaching its peak during the 1870s, when California produced a third of the world's mercury, making it the most significant era for mercury mining in state history. Mines in the mining district include the Brownlie mine; the Hastings mine; the Borges mine; and the St. Johns mine, which was considered to be the district's primary center of production. Known mine workings include short adits, open pits, and bulldozer cuts that extend over a wide area.

Paleontological Overview

The following overview is taken from *Paleontological Records Search for Syar Industries' Lake Herman Quarry Expansion Project, Solano County, California* (Finger 2010).

Geologic mapping of the region by Graymer et al. (1999) shows that most of the Project site consists of Upper Jurassic-Lower Cretaceous bedrock, which includes the Coast Range Ophiolite and the Great Valley Sequence. Although the Great Valley Sequence (undivided sandstone and shale) is paleontologically sensitive, having yielded marine reptiles fossils (ichthyosaurs and plesiosaurs), it has not been a source of any significant fossils in Solano County. The other Jurassic and Cretaceous units consist of igneous or metamorphic rocks (silicic volcanic rocks, basalt and serpentine) that generally have no fossil potential or sensitivity, and as expected, no

fossil localities are recorded in them. The Holocene deposits (alluvial and fluvial deposits) that are present in the southeastern corner of the Project site are too young to be considered fossiliferous.

However, the older Pleistocene deposits (landslide and older alluvial fan deposits), which are present within the eastern and western limits of the Project site, are potentially fossiliferous. The database of the University of California Museum of Paleontology (UCMP) lists nine upper Pleistocene vertebrate localities that have yielded specimens of Rancholabrean fauna. Among them are two localities in the vicinity of Benicia from which mammoth remains were recovered. Other fossils recovered from upper Pleistocene alluvium in Solano County include camel, elk, mastodon, horse, and ground sloth. One lower Pleistocene locality in Solano County yielded cotton rat.

Overview of Project Site

Cultural Resources

A cultural resources study for the project was conducted in late 2009 by the archaeologists and historians from the Anthropological Study Center (ASC), Sonoma State University (Scher 2010a). The purpose of the study was to identify and record any prehistoric or historic-era cultural resources that could be affected by the Project, and included background research and a pedestrian field survey. The pedestrian field survey included the Project site (as shown in Figure 2-3), including the bridge located about ½ mile to the southeast of the quarry, and a 113-acre parcel of quarry property located southwest of Lake Herman Road that is no longer part of the Project as currently proposed. The study also included contacting the Native American Heritage Commission and Native American individuals and organizations to obtain information about any known sacred sites and other traditional cultural resources.

As a result of the study, 13 historic-era archaeological sites and one historic bridge were identified and recorded. Following completion of the field survey, the 13 archaeological sites were evaluated for eligibility for listing in the California Register of Historical Resources (Scher 2010b).

Background Research

Background research was conducted prior to the field survey and consisted of a records search by ASC staff performed on November 9, 2009 at the Northwest Information Center of the California Historical Resources Information System (NWIC). The NWIC is the official State repository of archaeological and historical records and reports for a 16-county area that includes Solano County. The records search included a review of archaeological site records and study reports for the Project site and the area within a one-mile radius of the Project site. Additional research was conducted using files and literature at the ASC. The purpose of the background research was to determine if any cultural resources had been previously recorded within the Project site; to determine the likelihood of the presence of unrecorded resources based on historical references and the distribution and environmental setting of nearby archaeological sites; and to develop regional background and context information for the area.

The research found that one archaeological study had been previously undertaken within the Project site, which consisted of a record search and field survey conducted in 1983 along the right-of-way for Lake Herman Road. Other studies undertaken within a one-mile radius of the Project site identified seven historic resources, including the Hastings mercury mine (CA-SOL-325H), two dairies, Paddy Creek Dam, Sulphur Springs/Sky Valley School, and Lake Herman itself, all to the east of the Project site; and an open pit mine at the west end of the quarry property. None of the studies undertaken within the Project site or within a one-mile radius found evidence of prehistoric use of the area.

Tribal Contacts

The Native American Heritage Commission (NAHC) was contacted by ASC on October 28, 2009 to request a review of the Sacred Land Files for information on Native American cultural resources that might be within or adjacent to the Project area. The NAHC responded on

November 12, 2009, stating that their files did not indicate the presence of known Native American cultural resources in the immediate Project area. They provided a list of Native American individuals/organizations that might have knowledge of cultural resources in the area or concerns about the Project. ASC contacted each of the listed individuals/organizations by letter on November 16, 2009. Follow up phone calls made on November 23, 2009 resulted in responses from two individuals, Kesner Flores and Dave Jones, who expressed no present concerns about the Project but asked to be notified of any findings. In addition, a letter response received from the Yocha Dehe Wintun Nation on December 17, 2009 expressed no present concerns but requested notification of the discovery of any cultural resources or Native American human remains, and recommended that a tribal monitor be present during earthmoving activities.

Field Survey

Following completion of background research, ASC archaeologists conducted a pedestrian field survey of the Project site, and a 113-acre parcel west of Lake Herman Road on December 15 through 18, 2009. Excluded from the field survey was a 29-acre area in the southeast portion of the project site, which was determined to be too steep to safely traverse. Also excluded were two areas where heavy ground disturbance resulting from ongoing quarry operations precluded the presence of surface intact archaeological deposits. These areas include the existing 321-acre quarry and a small portion of the proposed eastern quarry expansion area. Also excluded was the quarry processing area that lies to the west of the quarry pit and is covered with 10 to 30 feet of fill (Pers. Comm., Jennifer Gomez, Syar Industries, 2010).

Thirteen historic era archaeological resources (designated as ASC 36 09 01 through ASC 36 09 13) and one historic bridge (designated as ASC 36 09 14) were identified and recorded within the area surveyed. The 13 historic era archaeological resources were mining-related archaeology sites, including a mercury kiln (furnace); two mining landscape that include mining cuts, waste rock piles, and soil berms; and portions of a road that may have been related to mining activity. These resources are associated with the Sulphur Springs Mountain/Vallejo mercury mining district, particularly the Brownlie mine. The resources are located within two areas of the Project site: the eastern quarry pit expansion area, the and the area of "no new ground disturbance", as shown in Figure 2-3. Also recorded as a historic resource is the bridge that is located to the southeast of the existing quarry along the Sulphur Spring Creek drainage near Sky Valley Road. One of the two mining landscapes was found within the 113-acre parcel of land located southwest of Lake Herman Road that is no longer part of the Project. This mining landscape is composed of the four mining-related sites designated as ASC 36 09 01 through ASC 36 09 04. Because these four sites would not be affected by the Project they are not discussed further in this EIR.

The following briefly describes the nine mining sites (ASC 36 09 05 through ASC 36 09 13) and the historic bridge (ASC 36 09 14) that were found within the Project site, as shown in Figure 2-3.

Kiln and Associated Features (ASC-36-09-05): A possible mercury kiln (or furnace) and 14 associated features (designated as ASC-36-09-05) are located within the area of "no new ground disturbance" as shown on Figure 2-3. This site is situated within a canyon on a terrace of a slope that abuts a tributary to Sulphur Springs Creek. The remains of the brick-built mercury kiln is the most prominent feature at the site. Associated features include wooden beams, a rock retaining wall, flats, cuts, waste rock, brick rubble, and road segments (described below as ASC-36-09-13). Structural brick fragments are unstamped red brick. A single, stamped firebrick was found. The stamp, "COWEN", identified it as made by Joseph Cowen and Company from 1823-1904.

Mining Landscape (ASC-36-09-06 through ASC-36-09-12): A mining landscape is located within the eastern quarry expansion area on the west slope of Sulphur Springs Mountain. This mining landscape is composed of seven mining-related sites (designated as ASC-36-09-06 through ASC-36-09-12) which include mining cuts into rock outcrops and directly into the hillside, waste rock piles, and berms. The sites occur at roughly the same elevation (approximately 600 ft above mean sea level). This area is highly eroded and prone to landslides. At one of the sites (ASC-36-09-06), four wooden posts surrounding the large prospect cut may have fenced the area off at one time.

Road Segments (ASC-36-09-13): Two segments of an approximately 8-foot wide road (designated as ASC-36-09-13) appear to run from the kiln site (ASC-36-09-13) to the mining landscape located in the eastern quarry expansion area (ASC-09-06 through ASC-36-09-12). The road was likely used to transport materials from prospect sites to the kiln for processing. Two segments of the road were traced within the Project site. One segment measures approximately 1,250 feet long and runs into the Project site from east to west for 550 feet and then heads north for 575 feet before exiting the Project site. The other segment is located in the area of "no new ground disturbance" and measures approximately 1,600 feet long. It enters the Project site running northwest where a large landslide has obscured approximately 700 feet of the road. Both road segments had recently been bladed at the time of the site visit and appeared to have been used.

Historic Bridge (ASC-36-09-14): The bridge structure (designated ASC-36-09-14) located to the southeast of the quarry, as shown in Figure 2-3, is composed of a dilapidated steel and wooden patchwork-constructed bridge and retaining wall that crosses Sulphur Springs Creek. It measures 83 feet long (northwest-southeast) and 14 feet wide (northeast southwest). Several brick and concrete fragments were found along the tops of the creek bank near the bridge, and piles of milled lumber lie on the flats on both sides of the bridge. Eucalyptus trees are present directly to the north on the western side of the creek. These observations are evidence that this was the location of a ranch headquarters or residence. Steve Olejnik stated that the bridge was constructed in 1956 or 1957 while Mr. Olejnik's great-grandparents and grandparents owned the property. Mr. Olejnik's grandfather and great-uncles constructed the bridge for access to their ranch.

California Register of Historical Resources Evaluation

Following completion of the pedestrian field survey, a historical resource evaluation was conducted by ASC personnel to assess whether the 13 historic-era mining resources, described above, constitute a historical resource for the purposes of CEQA (ASC 2009b). The 13 resources were evaluated together as a potential California Register of Historical Resources historic district identified as the Brownlie Mercury Mining Complex by applying the Criteria for Evaluation for the California Register of Historical Resources (Title 14, California Code of Regulations §4852[b][1-4]). A California Register historic district is a unified geographic entity containing a concentration of buildings, structures, or sites that are united historically, culturally, or architecturally (14 CCR §4852[a][5]). The district boundaries were defined as those of the Project site as shown in Figure 2-3. The existing quarry, pit, quarry buildings, and mining equipment were not included in this evaluation because at the time of the survey they were less than 50 years old, and consequently, did not meet the usual age requirement to constitute a historical resource for the purposes of CEQA.

The Criteria for Evaluation for the California Register require that a resource be significant at the local, state, or national level under one or more of the following:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time pass after a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resource". Fifty years is used as a general estimate of the time needed to develop the perspective to understand the resource's significance.

The California Register also requires that a resource possess integrity, which is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of

characteristics that existed during the resource's period of significance." To retain integrity, a resource should have its original location, design, setting, materials, workmanship, feeling, and association. Which of these factors are most important depends on the particular criteria under which the resource is considered eligible for listing.

Resources that are significant, meet the age guidelines, and possess integrity will generally be considered eligible for listing on the California Register.

Historical Research and Context: As part of the California Register evaluation, ASC personnel conducted historical research in April 2010. The goal of this research was to identify property owners, mining claims, and land use history, and to establish a historic context for the evaluation of the potential historic district. Repositories and sources consulted as part of this investigation included:

- Solano County Archives: probate records, court cases, tax assessments, voter registers, and agreements.
- Solano County Assessor-Recorder's Office, Fairfield: assessor parcel maps, deeds, leases, historical maps.
- Solano County Historical Society/Heritage: historical maps, article database, photographs.
- Solano County Library, Fairfield: local history collection.
- Bureau of Land Management: general land office plat map, historical index, master title plat, tract pages.
- On-line sources: federal census 1860-1910 (Ancestry.com), Google books, newspapers
- CDNC (Ancestry.com), Newspaperarchive.com, voter registers (Ancestry.com).
- California State Archives, Sacramento: articles of incorporation

The historical research revealed that the Brownlie Mercury Mining Complex was originally part of the Rancho Suscol that General M.G. Vallejo obtained from the Mexican government in 1843. Vallejo subsequently sold/gave the land to John B. Frisbee, his son-in-law, who sold portions of the tract. John Brownlie purchased 403 acres of Rancho Suscol land from Patrick Fogerty, who had purchased the land from Frisbee, in 1858. Three years later Brownlie also purchased 616 acres of Rancho Suscol land from Sylvester (SC: T Deeds 172). Although Brownlie was a joint patentee of most of this land, County Maps show that Brownlie was eventually the sole owner of the land. The land remained largely undeveloped and mining seems to have been its primary use.

Although the mercury deposit on the Brownlie property was discovered in 1852, commercial mining on the property began around 1868 when John Neate made an arrangement with John Brownlie to mine the property on a profit sharing basis. This venture was short lived and in 1868 William Baron and Company, who owned three other mines, made an offer to mine the site. Two tunnels and one shaft had been dug by the end of 1870. The Brownlie Mine temporarily closed in 1872 but was soon back in operation and ran at least through 1875.

The first documentary mention of the Brownlie furnace (kiln) was in the spring of 1874, but it may have been in operation at an earlier date. The furnace is mentioned again in 1875 as processing ore from the St. Johns mine. Although there is no record of the type of furnace in operation on the Brownlie property, it is likely to have been a Neate Coarse-Ore Furnace, the invention of John Neate. This type of furnace is known to have been used at the adjacent St. Johns and Hastings mines.

At times, Brownlie's Suscol property was used for purposes other than mining. In 1884, Brownlie leased out 497 acres known as "Brownlie's track" to four men who would build a dairy house and use the land for dairying. Brownlie, however, explicitly reserved the right to work the "Quicksilver Mine" located on the property if he so desired (3 Leases 412-413). There is no indication that John Brownlie and his family ever lived on the Rancho property.

When John Brownlie died in 1908 his estate included numerous land and stock holdings. During probate the 497 acres that included the mine were distributed to his widow and seven children. The "Brownlie Estate" Suscol land holdings remained unchanged well into the 20th century. Brownlie descendants sold the land to the Syar Lake Herman Quarry in the 1960s, but some descendants still own a portion of Brownlie's Suscol property.

Significance Conclusion: The above-described California Register evaluation concluded that the Brownlie Mercury Mining Complex district meets California Register Criterion 1 for its role in the history of mercury mining in Solano County, and Criterion 4 for its potential to yield important information about the technology of early mercury mining. An evaluation of the district's historic integrity concluded that the district has excellent integrity of association. It is strongly associated with John Brownlie and the series of mining companies that leased the property from him during the mid- and late-19th century. The district has fair integrity of setting and feeling. The district's immediate environment has been disturbed by historic and modern processes, although portions of the district have retained these aspects of integrity. The district has fair overall integrity of design. The functions of the surviving elements in the process of mercury extraction are clear, as are relationships between these elements. The lack of the mine portal itself is a significant deficit. The remains of what may be a Neate Coarse-Ore Furnace appear to have good integrity of design.

Research questions that could be addressed by additional study of the furnace include:

- What type of furnace is present at the site—is it a Neate Coarse-Ore Furnace?
- Was the furnace installed as patented or with modifications to adapt to local conditions? How were these processes adapted to the specific conditions at the site?
- How did the furnace function and in what ways was the technology improved or changed over time?
- How do the processes evident at the site conform to or vary from the documentary evidence? What conditions were responsible for the differences?

Paleontological Resources

A Paleontological Records Search was undertaken for the project by Dr. Kenneth Finger, Paleontologist (Finger 2010). No known sites have been identified on site. As described in the above Paleontological Overview, the search indicates that the Upper Jurassic-Lower Cretaceous bedrock and Holocene deposits that encompass most the Project site are considered to have no paleontological potential, and therefore no paleontological sensitivity. However, the older Pleistocene deposits (alluvial and fluvial deposits) present within the eastern and western limits of the Project site have the potential to yield significant paleontological resources. The potential to encounter such deposits is considered low because alluvial sediments are distributed in a spotty and rather unpredictable manner. This is because lowland streams meander, migrate, and flood throughout their valleys within relatively short intervals of time. In addition, deposition of sediments and vertebrate remains are not uniformly distributed in time or space, but tend to accumulate during the wet season at point bars, where they may or may not be preserved.

REGULATORY FRAMEWORK

Cultural Resources

California Environmental Quality Act (CEQA)

CEQA defines a "historical resource" as a resource that is eligible for listing on the California Register of Historical Resources (California Register), listed in a local register of historical resources (as defined at California Public Resources Code §5020.1(k)), identified as significant in a historical resource survey meeting the requirements of §5024.1(g) of the Public Resources

Code, or determined to be a historical resource by a project's lead agency (§15064.5(a)). A historical resource consists of:

Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources (§15064.5(a)(3)).

According to the California Environmental Quality Act (CEQA), "a project... that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (14 CCR §15064.5[b]).

California Health and Safety Code

California Health and Safety Code §7050.5 regulates the treatment of human remains. The Code states that "Every person who knowingly mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in §5097.99 of the Public Resources Code".

In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined that the remains are not subject to his or her authority. If the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the State Native American Heritage Commission.

California Public Resources Code

Public Resources Code §5097.9 regulates the State's treatment of Native American religion, establishes the State Native American Heritage Commission, and indicates how Native American human remains shall be handled.

National Historic Preservation Act

The National Historic Preservation Act of 1966 (80 Stat.915; 16 USC 470) declares historic preservation as a national policy and defines it as the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history architecture, archaeology, or culture, including the encouragement of preservation at the state, local and private levels.

Paleontological Resources

Paleontological Resources include fossil specimens, fossil sites, and fossil-bearing rock units. Fossils can be important for their potential to provide scientific information regarding past life forms, paleoecology, stratigraphy, and geological formation processes. Significant nonrenewable paleontological resources are fossils and fossiliferous deposits and associated environmental indicators. Certain plant and invertebrate fossils or assemblages may be defined as significant. A significant fossiliferous deposit is a rock unit or formation which contains significant nonrenewable paleontological resources defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontological resources are considered to be older than recorded history and/or older than 5,000 years BP (Conformable Impact Mitigation Guidelines Committee 1995).

Federal, state, and local regulations and policies protect paleontological resources. These include CEQA, the Antiquities Act of 1906, the National Landmarks Program, The California Public Resources Code, and the recently enacted Paleontological Resources Preservation Act. Professional standards of practice such as those adopted by the Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995 offer additional guidance for control and mitigation of adverse impacts on paleontological resources.

Goals and Policies of the Solano County General Plan

The following are the cultural resources policies and implementation programs from the Solano County General Plan (Solano County 2008a) that are applicable to the Project.

- RS.P-38 Identify and preserve important prehistoric and historic structures, features and communities.
- RS.P-39 Tie historic preservation efforts to the County's economic development pursuits, particularly those relating to tourism.
- RS.P-40 Consult with Native American governments to identify and consider Native American cultural places in land use planning.
- RS.I-25 Require cultural resources inventories of all new development projects in areas identified with medium or high potential for archeological or cultural resources. Where a preliminary site survey finds medium to high potential for substantial archaeological remains, the County shall require a mitigation plan to protect the resource before issuance of permits.
- RS.I-28 Protect and promote the county's historic and prehistoric resources by: providing educational programs to the public, staff, and commissions that promote awareness of the county's history and the value in preserving historic or prehistoric resources; and exploring and developing historic or prehistoric sites that can be used appropriately as visitor oriented destinations.

EVALUATION CRITERIA WITH THRESHOLDS OF SIGNIFICANCE

Table 4.5-1 summarizes both the evaluation criteria and significance thresholds used to address potential impacts to cultural and paleontological resources in this EIR.

TABLE 4.5-1

Evaluation Criteria with Significance Threshold – Cultural and Paleontological Resources

Evaluation Criteria	As Measured by	Significance Threshold	Sources of Criteria
CR-1. Will the Project cause a substantial adverse change in the significance of a historical or archeological resource?	Physical demolition, destruction, relocation, or material alteration of a historical or archaeological resource or property	Greater than 0 historical or archaeological resources or historic properties	CEQA Guidelines Appendix G, Checklist Item V (a) and Item V (b). Title 14, California Code of Regulations §15064.5 Public Resources Code §21084.1 Public Resources Code §21083.2(g) National Historic Preservation Act of 1966, as amended
CR-2. Will the Project disturb any human remains, including those interred outside of formal cemeteries?	Disturbance of any human remains, including Native American human remains, associated grave goods, or items of cultural patrimony	Greater than 0 human remains, associated grave goods, or items of cultural patrimony	CEQA Guidelines Appendix G, Checklist Item V (d). Title 14, California Code of Regulations §15064.5(d) Health and Safety Code §7050.5 Public Resources Code §5097.9
CR-3. Will the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Ground-disturbing activity within geologic units with the potential to contain significant paleontological resource or site.	Greater than 0 occurrences	CEQA Guidelines Appendix G, Checklist Item V (c) Public Resources Code §5097.5 Antiquities Act of 1906 National Landmarks Program Paleontological Resources Preservation Act

METHODOLOGY

The cultural resources analysis identifies known cultural resources within the Project site, including any prehistoric and historic archaeological sites, traditional cultural properties, historic architectural resources, and historic landscapes; identifies the potential for unknown cultural resources to be present in the project site; and analyzes the potential impacts to these resources. The paleontological resources analysis identifies the potential for paleontological resources to be present in the project site and identifies the potential impacts to these resources. The analysis considers that potential sources of impacts to cultural and paleontological resources from the Project may be as follows:

- Damage to or destruction of archaeological and unknown paleontological resources and human remains as a result of ground disturbing activities;
- Demolition, removal, relocation and alteration of historically or architecturally significant buildings, structures, or objects.

Because the 113-acre parcel of land to the southwest of Lake Herman Road that contains 4 of the 13 identified sites is no longer part of the Project, the 4 sites would not be affected by the Project.

IMPACTS AND MITIGATION MEASURES

Impact: CR-1: Will the Project cause a substantial adverse change in the significance of a historical or archeological resource?

Analysis: *Significant*

There are three historic or archeological features analyzed under Impact CR-1: the Brownlie Mercury Mining Complex District, the bridge, and Syar Industries buildings and mining equipment.

Brownlie Mercury Mining Complex District

Kiln and Associated Features (ASC-36-09-05). The possible mercury kiln and associated features are located within the area of “no new ground disturbance” shown on Figure 2-3 and therefore would not be directly affected by the Project. However because this site is situated adjacent to a currently used road, it could be inadvertently impacted by ongoing activities, such as maintenance of the access road.

Mining Landscape (ASC-36-09-06 through ASC-36-09-12). The Project has the potential to impact the mining cuts, waste rock piles, berms, and wooden posts that make up this mining landscape by expansion of the quarry in an easterly portion of the Project site.

Road Segments (ASC-36-09-13). The Project would not impact the approximately 1,600-foot long segment of the road that is located within the area of “no new ground disturbance”. However, the road segment that runs into the Project site from east to west and then takes a turn and heads north could be disturbed by reclamation activities.

The principal historic value represented in the Brownlie Mercury Mining Complex District is the information it can provide about early mercury mining technology (California Register Criterion 4). An appropriate mitigation for damage to this resource is to capture the information it contains before it is lost. Formal recordation of the 13 sites that constitute the district was conducted by ASC personnel during their 2009 archaeological field survey. The recordation included preparing detailed descriptions and photographing each historic feature on State of California Department of Recreation forms. This recordation captured the important information contained in 12 of the 13 sites, including

the mining landscapes and the road segments. The recordation of these resources mitigates potential impacts from the project to less than significant, and no additional mitigation is needed for loss of value under California Register Criterion 4.

The only remaining site within the district that contains important information under California Register Criterion 4 that has not been fully captured through recordation is the kiln remains and associated features (ASC-36-09-05). (Additional study of this site is needed to address the research questions described above.) This site is located within the area of no new ground disturbance and would not be directly affected by quarry expansion. However, because the site is located adjacent to a currently used access road, it is possible that the site could be inadvertently damaged or destroyed as a result of ongoing maintenance. This impact would be significant.

Lastly, as previously discussed, the district also is significant for its role in the history of mercury mining in Solano County under California Register Criterion 1. Recordation of the sites that make up the district does not serve to fully mitigate the loss of this historic value under Criterion 1. Therefore, impacts to any of the sites that make up the district remain significant.

Historic Bridge

The Project would replace the historic bridge structure (ASC-36-09-14) located southeast of the quarry. The bridge was constructed in 1956 or 1957 by previous owners of the property for access to their ranch. This patch work constructed bridge has not been evaluated for the California Register. Although it is unlikely that it meets any of the California Register evaluation criteria, such a formal determination has not been made. If the bridge meets the California Register criteria, its replacement would be a significant impact.

Syar Industries Buildings and Mining Equipment

Syar Industries buildings and mining equipment located in the process area would be removed or relocated if the quarry pit is expanded to the west as shown in Figure 2-3. The buildings and equipment would also be removed as part of reclamation of the quarry site at the end of the 35-year permit period. Removal or relocation of buildings and equipment that is 50 years old or older could constitute a significant impact.

Unknown Archaeological Resources

Additional unknown historic and prehistoric archaeological resources could be present within the project impact areas that were not identified during the field survey because they are obscured by vegetation or occur below the ground surface. If any such significant resources were impacted by the Project, the impact would be considered significant.

Mitigation: **CR-1a Minimize Impacts to Significant Historic Structures and Equipment**

Brownlie Mercury Mining Complex District

To mitigate the loss of value of the district under California Register Criterion 1, prior to disturbance of any of the mining sites that constitute the district, the Applicant shall prepare a website or public document that interprets the history of mining in Solano County, and the role played by the Brownlie Mercury Mining District, and shall provide the document to local historical societies and libraries.

Because under Criterion 1, the district is significant for its association with events that have made a significant contribution to the broad patterns of Solano County history, providing a detailed interpretation of the history of mining in Solano County, including the contributing role of the Brownlie Mercury Mining Complex District, and making this

documentation readily available to the public, would reduce the impact to this district to a less than significant level.

To reduce the potential for inadvertent damage or destruction of the historic kiln site (ASC-36-09-05), the Applicant shall fence the area containing the kiln and nearby features (e.g. rock retaining wall, wooden beams, and brick fragments) or otherwise protect the area from damage by ongoing quarry maintenance. The fencing shall be monitored on an annual basis and maintained for the length of the Use Permit.

Historic Bridge

Prior to removal of the historic bridge structure, the applicant shall retain a historian or architectural historian to evaluate the structure under California Register evaluation criteria. If it is found to meet the criteria, the structure must be formally documented, including providing a detailed description, and taking measurements and photographing all structural elements. The documentation shall be provided to Syar Industries, Solano County Resource Management, and the Northwest Information Center at Sonoma State University.

Syar Industries Buildings and Mining Equipment

Prior to removal or relocation of buildings and mining equipment within the quarry site, a qualified historian or industrial archaeologist shall evaluate their potential historic significance. If found to be significant, appropriate mitigation of impacts as identified by the qualified historian or industrial archaeologist, shall be implemented. For example, adequate mitigation could consist of detailed recordation, in-place preservation, or, for pieces of equipment, placement on display at a public facility.

Mitigation: **CR-1b Avoid or Minimize Impacts to Unknown Archaeological Resources**

Should archaeological materials be encountered during quarry expansion and related activities, the piece of equipment that encounters the materials must be stopped, and the find inspected by a qualified archaeologist. If the deposit contains significant archaeological materials the archaeologist should undertake data recovery of the deposit unless the project can be modified to allow the materials to be left in place. Data recovery efforts must follow standard archaeological methods.

After
Mitigation: *Less than Significant*

Mitigation measures CR-1a and CR-1b are designed to protect, preserve, or recover any significant cultural materials affected by the Project. With implementation of these measures, the Project would not cause a substantial adverse change in the significance of a historical or unique archeological resource.

Impact: CR-2: Will the Project disturb any human remains, including those interred outside of formal cemeteries?

Analysis: *Significant*

There is potential for currently unknown Native American human remains to be present within the project impact areas that, if present, could be disturbed by quarry expansion and associated activities. This would be a significant impact.

Mitigation: **CR-2 Treatment of Human Remains, Associated Grave Goods, or Items of Cultural Patrimony**

Should human remains, associated grave goods, or items of cultural patrimony be encountered during quarry expansion or during other ground-disturbing activities, the

following procedures shall be followed as required by Public Resources Code § 5097.9 and Health and Safety Code § 7050.5.

In the event of discovery or recognition of any human, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the Solano County Coroner has determined that the remains are not subject to his or her authority. If the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the State Native American Heritage Commission (NAHC). The NAHC shall assign a Most Likely Descendent (MLD). A qualified archaeologist, in consultation with the MLD, shall provide, in writing recommendations regarding the treatment of the human remains and any associated cultural materials. Copies of the recommendations shall be provided to Syar Industries, the County, the MLD, and the NWIC at Sonoma State University.

After
Mitigation: *Less than Significant*

The treatment of human remains in accordance with the requirements of Public Resources Code § 5097.9 and Health and Safety Code § 7050.5 as described under Mitigation Measure CR-2, would reduce this impact to less than significant.

Impact: CR-3: Will the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Analysis: *Significant*

Based upon a paleontological records search and sensitivity assessment conducted for the Project (Finger 2010), it was found that the type of geological units mapped over most of the Project site, including the bridge site, are considered to have no paleontological potential, and therefore no paleontological sensitivity. However, the older Pleistocene deposits (alluvial and fluvial deposits) present within the eastern and western limits of the Project site have the potential to yield significant paleontological resources. Although the potential to encounter such deposits is considered low, the disturbance of any such deposits as a result of quarry expansion or other ground disturbance would be considered a significant impact.

Mitigation: **CR-3 Evaluation and Treatment of Paleontological Resources**

If paleontological resources (e.g., vertebrate bones, teeth, or abundant and well-preserved invertebrates or plants) are encountered during quarry expansion or other activities, work in the immediate vicinity shall be diverted away from the find until a professional paleontologist assesses and salvages the resource, if necessary.

After
Mitigation: *Less than Significant*

Although the potential for encountering potentially significant paleontological resources is considered low, should such resources be found during construction, Mitigation CR-3 provides for their evaluation and salvage, if warranted. This measure reduces impacts to less than significant.

CUMULATIVE IMPACTS

Impact: **CR-C1: Will the Project's incremental effect on historical and archaeological resources be cumulatively considerable, based on criteria 1 and 2?**

Analysis: *Less than Significant*

The Project has the potential to impact the following known cultural resources: the Brownlie Mercury Mining Complex District, a historic bridge, and Syar Industries Buildings and Mining Equipment. The following relies on site specific studies and evaluates a) whether there are other closely related past, present or reasonably foreseeable future projects that could impact any of these resources, thus resulting in a greater impact than caused by the Project alone; and b) whether the Project's potential impact on these resources as a group would be greater than its impact to each resource individually.

There are no closely related present or reasonably foreseeable future projects that could impact any of the resources on the Project site. The Water Stone Development in Vallejo is too far away to impact the on-site resources. Past projects may have contributed to the partial loss of historic integrity of setting and feeling evidenced in the Brownlie Mercury Mining Complex District during the 2012 historic survey. However, this loss of integrity has been taken into account as part of the evaluation of the district's historic significance.

Because the Brownlie Mercury Mining Complex District, the historic bridge, and Syar Industries Buildings and Mining Equipment date from different time periods, and have the potential to yield information important to different periods and aspects of Solano County history (i.e., mercury mining in the 19th century, ranching in the mid-20th century, and aggregate mining in the 20th and 21st centuries), the Project impacts to the important information contained in these resources when considered as a group would not be greater than its impact to the important information contained in each resource individually.

As described in this EIR, appropriate studies were undertaken to ensure that cultural resources that could be impacted by the Project were identified, and that mitigation measures are put forth that would reduce the impacts to a less-than-significant level. These measures are consistent with Solano County General Plan Policies RS.P-38, RS.P-39, and RS.P-40, and the supporting implementation measures, which require the County to identify and preserve important prehistoric and historic structures, features and communities; tie historic preservation efforts to the County's economic development pursuits; and consider Native American cultural places in land use planning. In addition, the mitigation measures proposed for the Project are consistent with the mitigation measures identified in the 2008 General Plan EIR for mitigating historical and archeological resources.

Therefore, the Project's incremental effect to historical and archeological resources is not cumulatively considerable and would not contribute to any significant impacts to cultural resources that may be caused by other cumulative projects.

Mitigation: No mitigation is necessary.

Impact: **CR-C2: Will the Project's incremental effect on paleontological resources be cumulatively considerable?**

Analysis: *Less than Significant*

The type of geological units mapped over most of the Project site are considered to have no paleontological potential, and therefore no paleontological sensitivity. However, the older Pleistocene deposits present within portions of the Project site have the potential to

yield significant paleontological resources. The potential to encounter such deposits during quarry expansion and operation is considered low. But in the unlikely event that any such resources are encountered, Mitigation Measure CR-3 provides for their evaluation and salvage, if warranted, which would reduce any impacts to significant paleontological resources to less than significant. Therefore, the project would not contribute to any significant impacts to such resources that may be caused by other cumulative projects.

Mitigation: No mitigation is necessary.

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