3.17 Cultural and Paleontological Resources

3.17.1 Introduction

This section describes potential impacts on cultural and paleontological resources. Cultural resources include prehistoric archaeological sites, historic-era archaeological sites, traditional cultural properties (TCPs), and historic buildings, structures, landscapes, districts, and linear features. Prehistoric archaeological sites are places where Native Americans lived or carried out activities during the prehistoric period (as late as AD 1769). Prehistoric sites contain artifacts, cultural features, subsistence remains, and human burials. Paleontological resources are fossils: the remains or traces of prehistoric animals and plants possessing scientific as well as educational value. The purpose of this section is to describe the regulatory setting associated with cultural and paleontological resources, the affected environment for these resources, HST impacts on cultural and paleontological resources, and mitigation measures that would reduce these impacts.

The primary applicable federal and state laws and regulations protecting cultural resources are Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and California Public Resources Code Sections 5024.1 and 21084.1. Paleontological resources are not protected under Section 106, but are important for their scientific information. This section presents, as prescribed by Section 106, the results of surface inventory, surveys, background research, and Native American community and other interested party consultation to date. Section 106 also requires that effects on historic properties be taken into consideration in any federal undertaking; these effects are described here, with further detail provided in the *Merced to Fresno Section Historic Properties Survey Report* (HPSR; AECOM 2011a), the *Merced to Fresno Section Historic Architectural Survey Report* (HASR; AECOM 2011b), and the *Merced to Fresno Section Archaeology Survey Report* (ASR; AECOM 2011c). Information on the precise location of any archaeological site or archaeologically sensitive area is typically not divulged to the general public, in order to protect those resources and in conformance with professional standards and practice. Potential measures to avoid, minimize, and mitigate adverse effects on historic built properties, archaeological properties, and paleontological resources are also discussed in this section.

3.17.2 Laws, Regulations, and Orders

The following federal, state, and local laws, regulations, and agency jurisdiction and management guidance are pertinent to cultural and paleontological resources. Key cultural resources regulations that are most relevant to the proposed project are summarized below.

3.17.2.1 Federal

National Historic Preservation Act (NHPA) [16 U.S.C. Section 470 et seq.]

The NHPA establishes the federal government policy on historic preservation and the programs – including the National Register of Historic Places (NRHP), through which this policy is implemented. Under the NHPA, significant cultural resources, referred to as historic properties, include any prehistoric or historic district, site, building, structure, object, or landscape included in, or eligible for inclusion in, the NRHP. Historic properties also include resources determined to be National Historic Landmarks (NHLs). NHLs are nationally significant historic places designated by the Secretary of the Interior (SOI) because they possess exceptional value or quality in illustrating or interpreting United States heritage. A property is considered historically significant if it meets one of the NRHP criteria and retains sufficient historic integrity to convey its significance. This act also established the Advisory Council on Historic Preservation (ACHP), an independent agency responsible for implementing Section 106 of NHPA by developing procedures to protect cultural resources included in, or eligible for inclusion in, the NRHP. Regulations are published in 36 CFR Parts 60, 63, and 800.

36 CFR Part 800 Implementing Regulations Section 106 National Historic Preservation Act

Section 106 requires that effects on historic properties be taken into consideration in any federal undertaking. The process contains five steps: (1) initiating the Section 106 process; (2) identifying historic properties; (3) assessing adverse effects; (4) resolving adverse effects, and (5) implementing stipulations in an agreement document.

Section 106 affords the ACHP and the State Historic Preservation Office (SHPO), as well as other consulting parties a reasonable opportunity to comment on any undertaking that would adversely affect historic properties listed in or eligible for NRHP listing. The State Historic Preservation Officer administers the national historic preservation program at the state level, reviews NRHP nominations, maintains data on historic properties that have been identified but not yet nominated, and consult with federal agencies during Section 106 review.

The NRHP uses the National Register eligibility criteria (36 CFR §60.4) to evaluate significance. The criteria for evaluation are as follows:

a. [properties] that are associated with events that have made a significant contribution to the broad patterns of our history; or

b. [properties] that are associated with the lives of persons significant to our past; or

c. [properties] 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. [properties] that have yielded, or may be likely to yield, information important in prehistory or history.

Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be determined eligible for NRHP inclusion. In addition, a broader range of TCPs are also considered and may be determined eligible for or listed in the NRHP. TCPs are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history may be eligible because of their association with cultural practices or beliefs of living communities that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. In the NRHP programs, "culture" is understood to mean the traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, be it an Indian tribe, a local ethnic group, or the nation as a whole.

Archaeological and Historic Preservation Act [16 U.S.C. Sections 469 to 469(c)-2]

This act provides for preserving significant historic or archaeological data that may otherwise be irreparably lost or destroyed by construction of a project by a federal agency or under federally-licensed activity or program. This includes relics and specimens.

American Antiquities Act [16 U.S.C. Sections 431-433]

The American Antiquities Act was enacted with the primary goal of protecting cultural resources in the United States. As such, it prohibits appropriation, excavation, injury, or destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government, without permission of the secretary of the federal department with jurisdiction.

Neither the American Antiquities Act itself nor its implementing regulations (43 CFR Part 3) specifically mentions paleontological resources. However, many federal agencies have interpreted objects of antiquity as including fossils. Consequently, the American Antiquities Act represents an early cornerstone for efforts to protect the nation's paleontological resources.

American Indian Religious Freedom Act [42 U.S.C. Section 1996]

The American Indian Religious Freedom Act protects and preserves the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and Native Hawaiians. The act requires policies of all governmental agencies to respect the free exercise of Native religion and to accommodate access to and use of religious sites to the extent that the use is practicable and is not inconsistent with an agency's essential functions.

Section 4(f) of the Department of Transportation Act (49 U.S.C Section 303)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 23 U.S.C. 138 and 49 U.S.C. 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation land, wildlife and waterfowl refuges, and historic sites." Section 4(f) states that the Secretary of Transportation "may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- There is no prudent and feasible avoidance alternative to the use of the land from the Section 4(f) property; and
- The program or project includes all possible planning to minimize harm to the Section 4(f) property resulting from the use.

3.17.2.2 State

California Environmental Quality Act (CEQA), Public Resources Code Section 21083.2 and CEQA Guidelines California Code of Regulations, Title 14, Section 15064.5

CEQA Guidelines Section 15064.5 provides specific guidance for determining the significance of impacts on historic and unique archaeological resources. Under CEQA these resources are called *historical resources* whether they are of historic or prehistoric age. CEQA Public Resources Code Section 21084.1 defines historical resources as those listed, or eligible for listing, in the California Register of Historical Resources (CRHR), or those listed in the historical register of a local jurisdiction (county or city). NRHP *historic properties* located in California are considered historical resources for the purposes of CEQA and are also listed in the CRHR. The CRHR criteria for listing such resources are based on, and are very similar to, the NRHP criteria. CEQA Public Resources Code Section 21083.2 and CEQA Guidelines Section 15064.5(c) provide further definitions and guidance for archaeological sites and their treatment.

Section 15064.5 also prescribes a process and procedures for addressing the existence of, or probable likelihood, of Native American human remains, as well as the accidental discovery of any human remains within the project. This includes consultations with appropriate Native American tribes.

Guidelines for the implementation of CEQA define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G in Section 15023 provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. One of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section V, part c) is the following: "Would the project directly or indirectly destroy a unique paleontological resource or site?" Although CEQA does not define what is "a unique paleontological resource or site," Section 21083.2 defines "unique archaeological resources" as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets 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. It has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized import prehistoric or historic event.

This definition is equally applicable to recognizing "a unique paleontological resource or site." CEQA Section 15064.5 (a)(3)(D), which indicates "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history," provides additional guidance.

Section XVII, part a, of the CEQA Environmental Checklist asks a second question equally applicable to paleontological resources: "Does the project have the potential to…eliminate important examples of the major periods of California history or pre-history?" To be in compliance with CEQA, environmental impact assessments, statements, and reports must answer both these questions in the Environmental Checklist. If the answer to either question is *yes* or *possibly*, a mitigation and monitoring plan must be designed and implemented to protect significant paleontological resources.

The CEQA lead agency having jurisdiction over a project is responsible to ensure that paleontological resources are protected in compliance with CEQA and other applicable statutes. California Public Resources Code Section 21081.6, entitled Mitigation Monitoring Compliance and Reporting, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

Other state requirements for paleontological resource management are in California Public Resources Code Chapter 1.7, Section 5097.5 (Stats. 1965, c. 1136, p. 2792), entitled Archaeological, Paleontological, and Historical Sites. This statute defines as a misdemeanor any unauthorized disturbance or removal of a fossil site or remains on public land and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. This statute would apply to any construction or other related project impacts that would occur on state-owned or state-managed lands.

California Register of Historical Resources (PRC Section 5024.1 and 14 CCR Section 4850)

Public Resources Code Section 5024.1 establishes the CRHR. The register lists all California properties considered to be significant historical resources. The CRHR includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated under Section 106. The criteria for listing are similar to those of the NRHP.

The CRHR regulations govern the nomination of resources to the CRHR (14 CCR Section 4850). The regulations set forth the criteria for eligibility, as well as guidelines for assessing historical integrity and resources that have special considerations.

California Native American Graves Protection and Repatriation Act (California Health & Safety Code Section 8010 et seq.)

The California Native American Graves Protection and Repatriation Act establishes a state repatriation policy consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act. The act strives to ensure that all California Native American human remains and cultural items are treated with dignity and respect, and asserts intent for the state to provide mechanisms for aiding California Native American tribes, including non-federally recognized tribes.

3.17.2.3 Regional and Local

This section identifies local planning guidance and ordinances including general and specific plans, and historical/cultural resource district and protection ordinances. The section is organized by the county immediately followed by cities within that county to provide an overall framework for the geographic area.

The agencies with local jurisdiction along the alternative alignments include the counties of Merced, Madera, and Fresno and the cities of Atwater, Merced, Chowchilla, Madera, and Fresno. All of the cities and counties in the project vicinity have some form of plan or policy that recognizes the importance of historic preservation in their respective communities. Only Chowchilla and Fresno have established commissions and adopted ordinances that give them jurisdiction to review and comment on construction or planning projects involving locally designated landmarks. The Chowchilla Commission maintains a list of significant resources listed or eligible for the Local Register of Historical Resources. The Fresno County Historical Landmarks and Records Commission (created in 1965) maintains a list of county historic properties and landmarks. Both commissions are involved in land-use decisions when planning decisions involve historic structures.

Table 3.17-1 summarizes the local plans and policies that were identified and considered in the preparation of this analysis.

Table 3.17-1
Regional and Local Cultural Resource Plans and Ordinances

Location	Local Plan / Ordinance	Local Plan / Ordinance Details	Resources Addressed
Merced County			
City of Atwater	City of Atwater General Plan (City of Atwater 2000)	Addresses identification, protection, and preservation of cultural resources within the City's Planning Area.	Architectural and archaeological resources
City of Merced	Merced Vision 2015 General Plan (City of Merced 1997)	Addresses the identification and protection of historical, cultural and paleontological resources; diverse cultural resources; and long-term historic preservation planning. The City of Merced also adopted a historic preservation code (Chapter 17.54: Historic Preservation) and established a Design Review/Historic Preservation Commission to promote and protect the use of structures, sites, and areas important to local, state, or national history.	Architectural, paleontological, and archaeological resources
Madera County			
Madera County	Madera County General Plan (Madera County 1995)	Addresses the identification, protection, and enhancement of important historical, archaeological, paleontological, and cultural sites and their contributing environment. Policies include consultation with Native Americans.	Architectural, paleontological, and archaeological resources
City of Chowchilla	City of Chowchilla Draft 2040 General Plan (City of Chowchilla 2009)	Addresses the promotion, enhancement, identification, protection, and preservation of significant cultural and historical resources. The City also established a Heritage Preservation Commission and adopted a Heritage Preservation Ordinance. The Commission maintains a list of	Architectural and archaeological resources

Location	Local Plan / Ordinance	Local Plan / Ordinance Details	Resources Addressed
		significant resources listed in, or eligible for, the Local Register of Historical Resources.	
City of Madera	City of Madera General Plan Update and EIR, Public Review Draft (City of Madera 2009)	Addresses the protection and preservation of significant historical, archaeological, cultural, and fossil resources. Policies include using the Secretary of the Interior's Standards for preserving historic buildings.	Architectural, paleontological, and archaeological resources
Fresno County			
County of Fresno	Fresno County General Plan, Open Space and Conservation Element, Goal OS-J, Policies OS-J.1 through OS-J.13, Implementation Measure OSJ.A (Fresno County 2000)	The General Plan Open Space Element addresses the identification, protection, and preservation of historical, cultural, and geological resources. A number of policies describe the steps to be taken to ensure the identification, protection, and preservation of significant cultural resources. Other policies require communication with local Native American groups. The Fresno County Historical Landmarks and Records Commission (created in 1965) maintains a list of county historic properties and landmarks, a list of businesses in operation for 100+ years (Fresno County Centennial Business Inventory), a list of farms that have been in operation in the same family for 100+ years (Fresno County Centennial Farms), and a list of communities in existence for 100+ years (Fresno County Centennial Communities).	Architectural, archaeological, and geological resources
	Fresno County Code of Ordinances, Title 15, Chapter 15.04, Section 15.04.160, Historical Buildings (Fresno County 2010)	Section 15.04.160 of the municipal code provides the definition of historic buildings. Construction involving historical buildings is to comply with the applicable provisions of the California State Historical Building Code.	Architectural resources

Location	Local Plan / Ordinance	Local Plan / Ordinance Details	Resources Addressed
City of Fresno	2025 Fresno General Plan, Goals 3 and 11; Open Space and Recreation Element, Policy F-9-a; Resource Conservation Element, Objective G-10, Policies G-10-a through G-10-c, and G-11, Policies G-11-a through G-11-I (City of Fresno Planning and Development Department 2002)	The General Plan includes goals to preserve and revitalize historical resources and to protect, preserve, and enhance significant archaeological and paleontological resources. Policy F-9-a directs recreational activities to be designed and managed to protect cultural resources, such as archaeological and Native American religious sites. Objective G-10 calls for the identification, recognition, and promotion of historic and cultural resources. Objective G-11 calls for preserving resources which reflect important cultural, social, economic, and architectural features so that Fresno community residents will have a foundation upon which to measure physical change.	Architectural, archaeological, and paleontological resources and Native American religious sites
	City of Fresno Code of Ordinances, Chapter 12, Article 16, Historic Preservation Ordinance (City of Fresno 2007)	The purposes of the Historic Preservation Ordinance are to preserve, promote, and improve the historic resources and districts of the City of Fresno; to protect and review changes to these resources and districts which have a distinctive character or a special historic or cultural value; to preserve and regulate historic buildings, structures, objects, sites and districts which reflect the city's historic, cultural, social, economic, political, and architectural history; to preserve and enhance the environmental quality and safety of these landmarks and districts; and to establish, stabilize and improve property values, and to foster economic development. This article authorizes the formation of a Historic Preservation Commission, defines the designation criteria for historical resources, and requires a local register of historic resources.	Architectural and archaeological resources

3.17.3 Methods for Evaluating Impacts

A Programmatic Agreement (PA)[1] was developed among FRA, the Authority, the ACHP, the SHPO, and consulting parties, including Native American Tribes, for compliance with Section 106 NHPA as it pertains to the California HST Project. The PA provides an overall framework for conducting the Section 106 process throughout the HST System, and is included as Appendix 3.17-A of this document.

The PA provides consultation procedures, documentation standards, and federal agency oversight in compliance with the NHPA. The PA also provides guidelines for identification and evaluation of historic properties, including developing the Area of Potential Effects (APE); identification, documentation, and evaluation procedures for historic properties; and assessment of adverse effects. The PA presents the approach for the treatment of historic properties, including guidance on developing a Memorandum of Agreement (MOA) to address the treatment of adverse effects. The MOA for the Merced to Fresno undertaking will be prepared following SHPO review of the HPSR and related supporting documentation. Per the PA at Section V.A., "Consistent with Section 106, the public and consulting parties will have an opportunity to comment and have concerns taken into account on findings identified in Section 106 survey and effects documents via attendance at public meetings where they can submit comments on the information presented, as well as access the Section 106 documents via email requests to the Authority's website."

The MOA documenting agreement on the treatment of historic properties will be executed prior to issuance of a Record of Decision (ROD) by FRA, which will coincide with the completion of the Final EIR/EIS. The Merced to Fresno Section cultural resources survey, evaluation, and documentation process was conducted in accordance with the PA.

3.17.3.1 Study Area/Area of Potential Effects

Because this project is a federal undertaking, 36 CFR 800.4(a)(1) requires establishing a project APE. The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

The California State Historic Preservation Officer concurred with the initial version Merced to Fresno Section APE on August 16, 2010, prior to the refinement of alternatives. The initial APE was defined as a band centered on the project alternatives, expanding approximately 250 feet on either side of the centerline. The APE included the footprint of actual facilities that would be built (e.g., tracks, stations, switchyards, and maintenance facilities). The resulting APE along the UPRR/SR 99 Alternative ranged from 100 feet to 2,500 feet wide. The BNSF Alternative is much narrower, rarely more than 100 feet where it crosses agricultural properties, but expanding to accommodate yards, construction zones, and wider footprints where project engineering makes it necessary. In areas where there were proposed HMF locations, the APE also provided an approximately 250-foot buffer along the outside limits of those proposed facilities.

Following SHPO concurrence with the initial version of the APE, alternatives have been refined and revised. An updated APE based upon current designs and impacts has been prepared and submitted for review. The revised APE has been prepared in accordance with the guidance included within Attachment B of the PA. All cultural resources studies to support this document (HPSR, HASR, and ASR [Authority and FRA 2011a,b,c, respectively]) have been undertaken within this updated APE. The current APEs for archaeological and architectural resources are described below.

[1] *Programmatic Agreement Among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the California High-Speed Train Project*, June 30, 2011; hereinafter referred to as the PA (see Appendix 3.17-A of this Project EIR/EIS).

Archaeological APE

The APE for archaeological properties is the area of ground proposed to be disturbed during construction of the undertaking, including grading, cut-and-fill, easements, staging areas, utility relocation, borrow pits, and biological mitigation areas (not yet defined).

Historical Architectural APE

The current APE for historic architectural properties includes all properties that contain buildings, structures, objects, sites, landscapes, and districts that were more than 50 years of age at the time the intensive surveys were conducted (2010 and 2011). The historic architectural resources APE for the Merced to Fresno Section, derived from the current design, includes all legal parcels intersected by the proposed HST right-of-way, construction of proposed ancillary features (such as grade separations or maintenance facilities), and construction staging areas. This methodology for establishing the Historic Architectural APE follows both standard practices for the discipline and Attachment B of the PA, which provides that the APE shall include:

- Properties within the proposed right-of-way.
- Properties where historic materials or associated landscape features would be demolished, moved, or altered by construction.
- Properties near the undertaking where railroad materials, features, and activities have not been part of their historic setting and where the introduction of visual or audible elements may affect the use or characteristics of those properties that would be the basis for their eligibility for listing in the NRHP.
- Properties near the undertaking that were either used by a railroad, served by a railroad, or where railroad materials, features, and activities have long been part of their historic setting, but only in such cases where the undertaking would result in a substantial change from the historic use, access, or noise and vibration levels that were present 50 years ago, or during the period of significance of a property, if different.

The APE has been revised during the course of environmental review to reflect updated project information, as well as ongoing field efforts that clarify whether or not individual properties meet the above stipulations. As possible future project revisions take place, updated APE maps would be produced and authorized as per the stipulations of the PA.

Paleontological Study Area

For paleontological resources, the study area is a zone 250 feet on either side of the construction footprint for a given alternative, including any potential facilities and stations.

3.17.3.2 Cultural and Paleontological Resource Data Sources

Information regarding potential archaeological and historic architectural resources in the project vicinity includes the following:

- California Historical Resource Information System (CHRIS) Records, the Central California Information Center for Merced County, and the Southern San Joaquin Valley Information Center for Madera and Fresno counties.
- Historical maps and photographs.
- NRHP and CRHR Listings.
- Native American Heritage Commission (NAHC) Sacred Land Files.
- Caltrans Historic Bridge Inventory and Caltrans District 6 offices.

- Historical railroad files.
- Previous environmental studies within the study area.
- City and county historic registers and landmark lists.
- County Assessor building construction data.
- Merced, Chowchilla, Madera, and Fresno local libraries, historical societies, and planning offices.
- The paleontological site database maintained by the University of California at Berkeley Museum of Paleontology.
- The Paleobiology paleontological site database (http://paleodb.org/cgi-bin/bridge.pl?a=home).

Archaeological Resources

Archaeologists meeting the professional qualifications under the SOI's Standards for Archaeologists (48 CFR 44716) and meeting the definition of Qualified Investigator (QI) as per the PA, conducted the identification and evaluation of archaeological resources for the Merced to Fresno Section of the HST.

CHRIS records searches identified five previously recorded, NRHP-eligible or potentially eligible, archaeological sites within or adjacent to the project APE. As a means to further establish the archaeological context, the records search was expanded to include properties within a ½-mile radius of the project APE. Twelve additional previously recorded archaeological sites were identified within this expanded area. Five of the previously identified archaeological resources within or adjacent to the APE have been formally evaluated for NRHP or CRHR eligibility.

In addition to the above record search, a review of historic fire insurance maps, prepared by the Sanborn Company, was conducted to identify areas where previously unrecorded historic-era archaeological resources might be found. Sanborn maps, which had been scanned, were examined to allow visualization and comparison with respect to the Merced to Fresno Section HST APE. The historic Sanborn maps were generally available for all urban areas in the project vicinity, including Merced, Chowchilla, Madera, and Fresno.

In addition to the archival research discussed above, fieldwork was conducted to identify prehistoric and historic archaeological resources within the APE. Archaeologists inventoried the portions of the APE where access permission was granted. In areas with sufficient visibility of the ground surface, archaeologists walked in lines that were spaced no more than 45 feet apart to determine whether artifacts were present. Archaeologists visited previously recorded prehistoric and historic-era sites identified within the APE (where access was permitted) to compare previously recorded information with current conditions. As of March 31, 2011, approximately 27% (1,103 acres) of the UPRR/SR 99 Alternative had been field surveyed; 14% (542 acres) of the BNSF Alternative; 16% (388 acres) of the Hybrid Alternative; and 76% (1,064 acres) of the HMFs had been surveyed. Percentages include all portions of the APE where the UPRR/SR 99 and BNSF alternatives are the same. These percentages represent all of the parcels where access permission had been granted at the time of the survey. All archaeological surveys were restricted to the APE and did not include the ½-mile study area outside the APE.

The field procedures that guided the identification of archaeological sites encountered during the field investigations relied on the *Merced to Fresno Section Archaeological Identification and Evaluation Plan* (Authority and FRA 2011d), the PA (see Appendix 3.17-A), and the standards of professional practice of archaeology (see Section 110 of the NFPA of 1966 and the SOI's Standards and Guidelines for Identification of Historical Properties (48 FR 44716). The overarching approach to assessing the resources encountered in the field for the Merced to Fresno Section and the guidance for establishing historical property exemptions were defined in the PA. The criteria for what constitutes an "isolate" and a "site," and the process for the initial evaluation of a given resource are derived from the PA. As stipulated in the PA, Section 8 [A][1], a phased identification effort will be necessary as access is granted and

where adverse effects are likely to occur. This phasing will be coordinated through the establishment of the Memorandum of Agreement (MOA) and is not addressed further in the present document.

In locations assessed to have high probability for prehistoric sites, archaeologists conducted limited subsurface testing where access was allowed. These consisted of areas near permanent water sources, such as streams or rivers, which have high probability for prehistoric archaeological deposits. Archaeologists conducted testing using a combination of shovel test pits in softer soils and smaller-diameter auger tests where dense soil compaction made shovel test pits impossible. Archaeologists conducted testing at Ash Slough, Dry Creek, Berenda Slough, Berenda Creek, and Cottonwood Creek where these drainages cross the UPRR/SR 99 Alternative. Consultation with Native Americans also provided information on known or potential sites within the APE (consultation is recorded below). Details of the survey are provided in the ASR (Authority and FRA 2011c).

No subsurface testing has been performed at known archaeological site locations; testing in those areas where impacts are likely to occur will be undertaken after selection of a preferred alternative and access permission has been obtained. As described in the PA, known archaeological properties that cannot be evaluated prior to approval of an undertaking will be presumed to be NRHP eligible. The testing undertaken to date did not identify any significant archaeological resources (as per NRHP or CRHR criteria). In addition to future archaeological testing, detailed investigation of the hydrologic history of the Merced to Fresno segment of the HST will be a necessary component of future geoarchaeological studies still to be conducted. These studies will be performed to determine what drainages have the potential to contain deeply buried archaeological deposits. Where archaeological and geoarchaeological testing to formally determined NRHP eligibility is feasible, a project-specific MOA will be developed that includes provisions for a treatment plan that includes archaeological testing or the use of a combined archaeological testing and data recovery program.

Historic Architectural Resources

Architectural historians meeting the professional qualifications under the SOI's Standards for Architectural History, and meeting the definition of QI as per the PA, conducted the identification and evaluation of historic architectural resources for the Merced to Fresno Section of the HST. QIs developed the APE for historic architectural resources and conducted intensive-level surveys of the entire APE. Intensive-level surveys included all built-environment resources constructed in 1960 and earlier to account for all resources 50 years or older at the time of survey. The architectural resource types listed in Attachment D of the PA were exempt from evaluation because they do not demonstrate potential for historic significance; however, some were still surveyed to determine whether they met exceptional significance criteria.

In addition to the sources listed at the beginning of this section, the following data sources were also reviewed for historic architectural resources:

- National Register of Historic Places (both listed and determined-eligible properties)
- California Register of Historical Resources
- *California Inventory of Historic Resources* (California Office of Historic Preservation 1976)
- *California Points of Historical Interest* (California Office of Historic Preservation 1992)
- *California Historical Landmarks* (California Office of Historic Preservation [1990] 1996
- Directory of Properties in the Historic Property Data Files for Merced, Madera and Fresno Counties
- Sanborn maps for urban areas
- Historic U.S. Geological Survey quadrangles

The historical overview presented in this section, as well as the detailed historic context and property-specific research conducted for the significance evaluations, were based on a wide range of primary and secondary materials gathered by QIs. See the HPSR (Authority and FRA 2011a) and the HASR (Authority and FRA 2011b). Research on the historic themes and survey population was conducted in both archival and published records, including but not limited to, the following:

Merced County:

- Merced County Assessor
- Merced County Planning & Community Development Department
- Merced County Library
- City of Merced Planning Division
- Merced County Courthouse Museum/Merced County Historical Society

Madera County:

- Madera County Assessor's Office
- City of Madera Planning Department
- Madera County Library
- Chowchilla Library

Fresno County:

- Fresno County Assessor's Office
- City of Fresno Planning & Development
- Fresno County Library – California History and Genealogy Room
- California State University, Fresno – Henry Madden Library

Statewide Sources:

- California History Room, California State Library, Sacramento
- California State Archives, Sacramento
- California State Railroad Museum, Sacramento
- Online Archive of California (www.oac.cdlib.org)
- Los Angeles Public Library Online Database Collections

In addition, QIs reviewed the CHRIS, publications and updates for the California Historical Landmarks and Points of Historical Interest, the NRHP, the CRHR, and local register listings. QIs also used published and digital versions of U.S. Census Bureau information, including population and agricultural schedules.

The record searches by the CHRIS centers indicated that a total of 45 cultural resources studies have been conducted within the project corridor. In addition, a total of 112 cultural resources studies have been conducted within the ½-mile radius of the project APE.

If an archaeological or historic architectural resource is not listed in or determined to be eligible for listing in the NRHP or the CRHR, it is not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or is not identified in a historic resources survey (meeting the criteria in Section 5024.1 (g) of the Public Resources Code, a lead agency may still determine it to be a historical resource as defined in Public Resources Code Section 5020.1(j) or 5024.1.

Once the historic architectural APE was defined, fieldwork began. The survey identified hundreds of historic architectural resources that did not appear in the South San Joaquin Valley Information Center search results. The historic architectural resources that could be potentially eligible for listing in the NRHP or CRHR became the study population.

Intensive-level field survey and field research on the study population resources were conducted between August 2010 and June 2011 to address any additional resources brought in to the APE by refinements made to reflect new project information. Specifically, this intensive-level survey addressed known and potential historic properties and historical resources within the APE that were 50 years of age, or older, at the time of survey. This survey was reported in the HPSR (Authority and FRA 2011a), consistent with the requirements of the PA.

The intensive survey also addressed resources that required evaluation because they had not been previously studied and did not meet the Section 106 PA criteria for "streamlined documentation." The evaluation of these resources concluded that they are not eligible for listing in the NRHP or CRHR, and these results were presented in the HASR as required by the Section 106 PA. Historic architectural resources that met the criteria for "streamlined documentation" were also reported in the HASR.

All surveys and complete inventories were conducted from public rights-of-way, except in cases where the property owners were contacted to provide entry to a property not adequately visible from a public right-of-way. Access was arranged in the manner specified in the project protocol for such contact, and the inventory was completed for the entire survey population for both the HPSR and HASR. Details of the historic architectural survey are provided in the HPSR and the HASR (Authority and FRA 2011a,b, respectively).

Determination of Effect on Cultural Resources

The analysis of potential effects on cultural resources is based on the Criteria of Adverse Effect described in regulations implementing Section 106 of the NHPA (36 CFR 800.5). Under these regulations, an undertaking has an effect on a historic property when the undertaking may alter, directly or indirectly, the characteristics of the property that may qualify the property for inclusion in the NRHP [36 CFR Part 800.5(a)]. An effect is considered adverse when the effect on an NRHP-eligible property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Consideration will be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR 68) and applicable guidelines.
- Removal of the property from its historic location.
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Native American tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Ethnographic resources are considered eligible for inclusion in the NRHP as TCPs when they are rooted in a community's history, are important in maintaining the continuing cultural identity of the community, and meet criteria for evaluation and integrity. Intensity of impacts on ethnographic resources may relate to access and use of, as well as changes to, traditionally important places. While traditionally associated with Native American cultural practices, such as communal gathering locations or mythology, TCPs can be relevant for any group that associates a location with cultural tradition, sense of place, or specific values.

For example, Basque sheepherders who returned to the same mountain meadows annually may consider those locations as a TCP. However, no TCPs, either Native American or otherwise, have been identified to date. Additional efforts to identify and consult with affected groups will be addressed during the development of the MOA, which may result in the identification of TCPs. Should TCPs be identified, and if the project as designed poses a potential effect on those resources, the MOA will account for those concerns and contain measures intended to address potential effects.

Paleontological Resources

Qualified paleontologists reviewed geologic maps and paleontological site records covering the bedrock and surficial geology of the project vicinity to identify the exposed and near-surface rock units, to assess the potential paleontological productivity of each rock unit, and to delineate their respective areal distribution in the study area. A qualified paleontologist also reviewed site records documentation and paleontological literature to determine the number and locations of previously recorded fossil sites from rock units exposed in and near the study area and the types of fossil remains each rock unit has produced. The presence of sediments suitable for containing fossil remains and the presence of any previously unrecorded fossil sites was documented during the field survey, which included visual inspection of exposures of sediments with the potential to yield fossils in the study area. A qualified paleontologist performed a field reconnaissance of all alternatives considered in this analysis. Field reconnaissance confirmed that, because of widespread agricultural activities and other land management practices, as well as extensive development, no paleontological resources are visible on the ground surface. No subsurface testing was performed because no potential paleontological sites were located.

Impacts on paleontological resources were analyzed qualitatively, based on professional judgment and consistent with the methods recommended by the Society of Vertebrate Paleontology (SVP 1995; n.d.). The SVP methods separate resources into *high* and *low* sensitivity categories. Similar to modifications to the SVP methods by others (for example, the Potential Fossil Yield Classification System promulgated for paleontological resources inventories by Bureau of Land Management [BLM 2008]), this project uses a *moderate* sensitivity category.

Fossil materials are usually buried in subsurface geologic units rather than exposed at the ground surface; therefore, the presence of paleontological resources is uncertain until project earthwork has begun. Thus, impact analysis for paleontological resources is based on probabilities of effect. The two-phase process described below was used to take these uncertainties into account:

- Assess the likelihood that the sediments affected by a project's implementation contain scientifically important, nonrenewable paleontological resources that could be directly or (in very rare cases) indirectly affected. This likelihood is considered to be proportionate to a geologic unit's paleontological sensitivity.

- According to the identified degree of sensitivity, formulate and implement measures to mitigate potential adverse impacts. Mitigation measures are normally not recommended for sediment with low or no sensitivity, and are usually recommended for sediment with moderate or high paleontological sensitivity.

Public agencies must treat all historical and cultural resources (including paleontological resources) as significant unless the evidence demonstrates that they are not historically, culturally, or scientifically significant. Paleontological resources (fossils) are the remains or traces of prehistoric plants and animals. Fossils are important scientific and educational resources because of their use in (1) documenting the presence and evolutionary history of particular groups of now extinct organisms, (2) reconstructing the environments in which these organisms lived, and (3) determining the relative ages of the strata in which they occur and of the geologic events that resulted in the deposition of the sediments that entombed them.

3.17.3.3 Agency, Native American and Public Outreach

The Merced to Fresno Section has an Agency Coordination Plan (June 2009) and a Public Participation Plan (August 2009) to organize coordination through the project development process. In addition, the PA describes the Native American consultation process. Consultation with the SHPO, ACHP, and the California NAHC and representatives of Native American tribes regarding potential impacts on archaeological and historic architectural properties, cultural sites, and prehistoric archaeological sites has been ongoing throughout this project, and will continue as the project progresses.

Agency Outreach

The FRA initiated coordination with the California SHPO in January 2009 to discuss the development of an environmental method for the HST, review adopted mitigation measures from the Program EIR/EIS, and discuss the need for a MOA. The FRA and SHPO concluded that a PA should be prepared for the entire HST System, and MOAs prepared for each section. The FRA subsequently prepared a PA in consultation with the SHPO and ACHP. As noted below, nine public meetings were held for which letters were sent to members of the public, agencies, and each of the tribes listed in the PA. These meetings are recorded in Chapter 7.0, Public and Agency Involvement (Table 3.17-2).

Table 3.17-2
FRA Coordination with SHPO and ACHP

Action	Date	Summary
Meeting between FRA and SHPO	January 29, 2009	Development of environmental method, mitigation measures, and the creation of a PA and MOAs discussed.
FRA/Authority/SHPO Coordination Meeting	February 3, 2010	Discussion about SHPO edits to draft PA
FRA sends letter (with draft PA attached) to SHPO and ACHP inviting participation in the development of the PA	February 3, 2010	
ACHP sends letter to FRA	March 8, 2010	ACHP declares intention to participate in PA development.
ACHP sends letter to FRA	March 8, 2010	ACHP requests a teleconference between the FRA, ACHP, and SHPO to discuss the PA, and recommends using prototype PA [36 CFR 800.14(b)(4)].
Meeting between FRA and ACHP	April 1, 2010	
ACHP sends letter with draft PA comments to FRA	April 19, 2010	
FRA sends letter to ACHP	n.d (post-dates April 19, 2010)	FRA acknowledges ACHP's March 8, 2010 letters; summarizes the April 1, 2010, meeting; states that the FRA will not use the prototype PA suggested by the ACHP; and expresses interest in scheduling a meeting to discuss the PA and tribal consultation.

Native American Outreach

Consultation with the SHPO and the California NAHC and representatives of Native American tribes regarding potential impacts on archaeological sites and TCPs has been ongoing throughout this project. Native American outreach began with an initial letter to the tribes in December 2009. Formal Consultation between FRA and federally designated Native American Tribes began in February 2010.

Following is a list of Native American tribes in the project corridor that were invited to participate in the process. Those who have participated are identified first in the following lists.

Federally Recognized Tribes:

- Big Sandy Rancheria[2] of Mono Indians of California, Auberry, CA 93602 (accepted)
- California Valley Miwok Tribe, Stockton, CA 95210
- Cold Springs Rancheria of Mono Indians of California, Tollhouse, CA 93667
- North Fork Rancheria of Mono Indians of California, North Fork, CA 93643
- Picayune Rancheria of Chuckchansi Indians of California, Coarsegold, CA 93614
- Santa Rosa Indian Community of the Santa Rosa Rancheria, Lemoore, CA 93245
- Table Mountain Rancheria of California, Friant, CA 93626-0177
- Tule River Indian Tribe of the Tule River Reservation, Porterville, CA 93528

Non-Federally Recognized Tribes and Tribal Organizations:

- Chowchilla Tribe of Yokuts, Fresno, CA 93720 (accepted)
- Amah Mutsun Band of Mission Indians, Woodside, CA 95821 (accepted)
- Dumna Wo-Wah Tribal Government, Auberry, CA 93602 (accepted)
- Southern Sierra Miwuk Nation, Mariposa, CA 95338 (accepted)
- Choinumni Tribe, Clovis, CA 93611
- Chukchansi Yokotch Tribe, Raymond, CA 93644
- Dumna Tribal Government, Fresno, CA 93702
- Dumna Cultural Preservation Association, Fresno, CA 92716
- Dunlap Band of Mono Indians, Dunlap, CA 93621
- Esohm Valley Band of Indians, Salinas, CA 93906
- Kawaiisu Tribe of Tejon Reservation, Kernville, CA 92716
- Kern Valley Indian Council, Weldon, CA 93283
- Kings River Choinumni Farm Tribe, Clovis, CA 93612-2211
- North Fork Mono Tribe, Clovis, CA 93619
- North Valley Yokuts Tribe, Linden, CA 95236
- Sierra Tribal Consortium
- Sierra Nevada Native American Coalition, Dunlap, CA 93621
- Chumash Council of Bakersfield, Bakersfield, CA 93302
- Tejon Indian Tribe, Wasco, CA 93280
- Traditional Choinumni Tribe, Sanger, CA
- Yokuts Archaeological Advisory Team, Porterville, CA 93258

Individuals Registered with the NAHC:

- Delia Dominquez, Covina, CA 91722 (Yowlumne; Kitanemuk)
- Frank Arrendondo, Santa Barbara, CA 93102 (Chumash)

[2] The Spanish word “Rancheria” refers to the workers’ quarters of a rancho, and has become extended into English to mean a native village.

Table 3.17-3 summarizes the outreach with Native American Tribes undertaken to date.

Table 3.17-3
FRA Tribal Consultation

Action	Date	Summary
Initial search conducted for Native American Tribes in Project Study Area	March 2009	Informational search undertaken for broad area.
Invitations sent to attend scoping meeting	March 2009	Fact sheet on project sent out.
NAHC Sacred Lands Search	April–May 2009	NAHC contacted to request a search of the Sacred Lands file for the project corridor and a list of groups and individuals who might have information on cultural resources within the project APE.
Letters sent to individual contacts provided by NAHC	October 2009	
Telephone contacts	November 2009	A phone call and a follow-up call was placed to each contact provided by the NAHC requesting comment or information.
Consultation request letter mailed to tribes listed in the Tribal Consultation Plan	December 17, 2009	
Second NAHC Sacred Lands Search	January 2010	A second request was sent reflecting changes to the original alignment sent in April 2009.
Letter initiating request for government-to-government coordination mailed from FRA to federally recognized tribes	February 25, 2010	Responses received from the Fernandeno Tataviam Band of Mission Indians (March 8, 2010), the Pala Band of Mission Indians (March 16, 2011), the Pechanga Temecula Band of Luiseno Indians (March 30, 2011), the San Manuel Band of Serrano Mission Indians (March 21, 2011), the Soboba Band of Luiseno Indians (March 8, 2011), and the United Auburn Indian Community (March 17, 2010).
Communication Meeting for all interested tribal members	July 22, 2010	Organized meeting in Visalia to allow a forum for the community to provide feedback. No Native American representatives attended.
Consultation Meeting for all interested tribal members	August 16, 2010	Representatives from Dumna, Amah Mutsun, Choinumni Tribes, and Big Sandy Rancheria attended or participated by phone. Authority and FRA representatives presented project information.
Letter follows up on the initial request for government-to-government coordination between the FRA and federally recognized tribes, and issues an invitation to participate in a telephone conference scheduled for December 15, 2011, mailed from FRA to federally recognized tribes.	December 6, 2010	
Telephone conference for coordination between the FRA and federally recognized tribes.	December 15, 2010	

Action	Date	Summary
Letter from FRA to federally recognized tribes summarizes the December 15, 2010, conference call as a "productive session" and issues an invitation to a second telephone conference planned for January 19, 2011. The draft PA was enclosed with this letter, and the FRA invited participation in the PA's development, as well as the forthcoming draft MOA template.	December 28, 2011	Responses received from the Pechanga Temecula Band of Luiseno Indians (February 18, 2011), and the Soboba Band of Luiseno Indians (February 24, 2011).
Letter sent from FRA to federally recognized tribes invites tribes to meet with the FRA to consult about the HST System between June 20 and 24, 2011, in the project area.	May 27, 2011	California Valley Miwok Tribe responded on June 17, 2011.
Native American (Informal) Consultation Meeting to obtain input from interested Native American Groups and Individuals	June 1, 2011	Meeting convened by the Authority and FRA in Fresno, California, to update tribal representatives regarding status of cultural resources investigations, request representatives to delineate areas of interest and potential responsibility, and to obtain input regarding concerns and/or interests. Questions and concerns offered by attendees addressed monitoring during construction, repatriation of human remains, the source of aggregate for construction, and general environmental inquiries. Representatives from the federally recognized Big Sandy Rancheria and the Cold Spring Rancheria, both with interests in the Fresno-Bakersfield Section study area attended the meeting; representatives from the non-federally recognized Southern Sierra Miwuk Nation and the Sierra Nevada Native American Coalition, who share interests in the area were also in attendance.
Formal Tribal Consultation with Federally Recognized Tribes	June 22-23, 2011	FRA representatives consulted with representatives from the San Manuel Band of Serrano Mission Indians and Soboba Band of Luiseno Indians on June 22, 2011. FRA representatives consulted with representatives from the Pechanga Temecula Band of Luiseno Indians on June 23, 2011.
Consultation Meeting for all interested tribal members	July 27, 2011	Representatives from all tribal entities that were identified by the NAHC, and through coordination efforts over the past 2 years, were invited to this meeting. Meeting involved representatives from both the Merced to Fresno and Fresno to Bakersfield sections, as tribal areas overlap in the Fresno portion of both projects.

These coordination efforts have resulted in the following:

1. Members of tribes offered to provide confidential information on TCPs and possible archaeological sites so that the project may avoid or minimize impacts. TCPs have not been identified to date. Some sensitive archaeological sites have been identified and discussed herein.

2. Members of the tribes will provide the Authority with geographic boundaries that separate the various tribes' interests so that, if cultural sites are found, appropriate coordination and development of the MOA for the treatment of these sites can proceed with the appropriate tribal representatives.

3. An MOA will be developed among affected parties and consulting parties to resolve adverse effects on historic properties that result from the undertaking.

4. Native American outreach activities are ongoing. Native American tribes have been consulted during the project in accordance with the framework in Attachment E of the PA. Tribal entities were notified about the initiation of the Section 106 process in 2009, and were consulted during the preparation of the PA between 2010 and its execution in 2011. Native Americans have also been consulted about the APE and about potentially sensitive cultural and archaeological resources. Native Americans will continue to be consulted at each key decision point of the Section 106, CEQA, and NEPA processes, and their input integrated into the project planning process.

Consultation with the California SHPO and the appropriate interested parties regarding potential effects on built environment properties has been ongoing throughout this project. As part of the outreach process, letters were sent to interested parties in 2009 and supplemental letters were sent in July 2010. The recipients, listed below, include such interested parties as area museums and local historical societies, in compliance with the consultation requirements of NHPA and its implementing regulations (36 CFR 800). Interested parties contacted during this process included the following:

- Clovis-Big Dry Creek Historical Society, in the Clovis Museum
- Fresno Art Museum
- Fresno City and County Historical Society
- Gustine Museum
- Kearney Mansion Museum
- Madera County Historical Society
- Merced County Historical Society and Merced County Courthouse Museum
- Society for California Archaeology Department of Anthropology, California State University, Fresno

No responses were received from the first (2009) and second (2010) round of letters; however, these previously identified organizations will be contacted again during the public review period for the Project EIR/EIS. Information collected during that effort will be incorporated into subsequent versions of the EIR/EIS and technical reports (HPSR, HASR, and ASR) following the public review period.

Additional and potential interested parties, including planning agencies, local government planning departments, and/or historic preservation programs, were identified since the previous outreach efforts in 2009 and 2010. These organizations also will be contacted during the public review period to solicit their input regarding cultural resources on the project. Any additional information gathered from these organizations will also be incorporated into subsequent versions of the EIR/EIS and the technical reports. The additional groups include the following:

- The California Historical Society
- California Genealogical Society and Library
- Atwater Historical Society/Bloss House Museum
- Castle Air Museum
- City of Merced Design Review Board/Commission and Historic Preservation Commission
- Fresno County Archaeological Society
- Fresno Neighborhood Alliance

- Heritage Fresno Committee of the American Association of University Women (AAUW)

As per PA stipulation V.A., these interest groups and interested individuals will be invited to comment on the treatments proposed, and those with demonstrated interest in the project will be invited to participate as consulting parties.

3.17.3.4 Methods for Evaluating impacts under NEPA

In considering whether an action may "significantly affect the quality of the human environment," an agency must consider, among other things, the unique characteristics of the geographic area such as proximity to historic or cultural resources (40 CFR 1508.27[3]), and the degree to which the action may adversely affect districts, sites, linear features, landscapes, buildings, structures, or objects listed, or eligible for listing, in the NRHP, or may cause loss or destruction of significant scientific, cultural, or historical resources (40 CFR 1508.27). Cultural resource findings are presented consistent with 36 CFR Part 800.5, applying the criteria of Adverse Effect or determining there is No Adverse Effect or No Effect.

Pursuant to NEPA regulations (40 CFR 1500-1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration of the effect (short- or long-term), and other consideration of context. Beneficial effects are identified and described. When there is no measurable effect, impact is found not to occur. Intensity of adverse effects is summarized as the degree or magnitude of a potential adverse effect where the adverse effect is thus determined to be negligible, moderate, or substantial. It is possible that a significant adverse effect may still exist when on balance the impact is negligible or even beneficial.

For paleontological resources, adverse effects are further described in terms of the degree or magnitude where the adverse effect is thus determined to be negligible, moderate, or substantial. It is possible that a significant adverse effect may still exist when on balance the impact is negligible or even beneficial.

However, the ACHP promulgated in the revised Section 106 regulations preamble (ACHP 2001: 49) that the rules contain "no significance or materiality limitations, such as those contained in the NEPA that limit most of that statute's key provisions only to actions that might significantly affect the environment. In contrast, the ACHP Section 106 rules seek to require agencies to examine all effects of any intensity, whether or not the effects are significant. Where there is an alteration of a historic property, any diminishment of any aspect of its historic integrity, however measured and however great or small, can support a finding of adverse effect." As a result, any reduction in the intensity of an impact through mitigation would not necessarily reduce an adverse effect to a no effect. That is, although actions determined to have an adverse effect under Section 106 and 36 CFR 800 may be mitigated, the effect remains adverse.

Nevertheless, the following defines the impact intensities for archaeological and historic architectural resources as addressed in this document and the definitions provided by the NPS (2008):

- Negligible Effect – the effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The Section 106 determination would be no adverse effect.

- Moderate Adverse Effect – the effect is measurable and perceptible. The effect changes one or more of the characteristics that qualify the historic property(s) for inclusion in the National Register and diminishes the integrity of the historic property(s), but does not jeopardize the National Register eligibility of the historic property(s). For purposes of Section 106, the determination of effect would be adverse effect.

- Major (Substantial) Adverse Effect – the effect on the archaeological site or group of sites is substantial, noticeable, and permanent. The action severely changes one or more characteristics that qualify the historic property(s) for inclusion in the National Register, diminishing the integrity of the

historic property(s) to such an extent that it is no longer eligible for listing in the National Register. For purposes of Section 106, the determination of effect would be adverse effect.

Archaeological Resources

A negligible impact is barely perceptible and would not cause changes to the significant characteristics of a resource of interest. A moderate impact is perceptible and would cause measurable changes to the significant characteristics of a resource of interest. However, those changes do not rise to the level of reducing the resource's significance by inhibiting interpretive potential and/or only a moderate percentage of the significant characteristics will be affected. A substantial impact is one that causes perceptible changes to the significant characteristics of a resource of interest, and those changes inhibit interpretive potential of a major percentage of the significant characteristics.

Historic Architectural Resources

A negligible impact for historic architectural resources is barely perceptible and not measurable, with changes confined to a single resource of interest or contributing element of a larger NRHP district. Changes do not adversely affect significant characteristics. A moderate impact is perceptible and consists of measurable changes to the significant characteristics of a single resource of interest or small group of contributing elements within a larger NRHP district. A substantial impact is perceptible and measurable and includes changes of substantial magnitude to significant characteristics of a single resource of interest or large group of contributing elements within an NRHP district.

Paleontological Resources

Assessments of impacts on paleontological resources are based on the probability that fossils will be encountered during ground disturbance, and the probable scientific importance of the affected fossils. A negligible impact includes the damage or destruction of a fossil which cannot be identified, such as casts and molds of roots and animal burrows, or one that is out of stratigraphic context. A moderate impact is the damage or destruction of a fossil or fossils possessing less scientific importance because they are abundant and well-collected, or poorly preserved. Moderate impacts are also projected when a sedimentary unit is known to yield only widely dispersed and relatively scarce paleontological material. A substantial impact is the damage or destruction, or loss to the scientific community through vandalism or unauthorized collection, of a scientifically important fossil or fossils (i.e., vertebrate fossils).

3.17.3.5 Methods for Evaluating Impacts under CEQA

Based on CEQA guidelines, the project would result in a significant impact on cultural or paleontological resources if it would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

State CEQA guidelines use the following definitions to analyze impacts on historical or archaeological resources:

- Substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired [Section 15064.5(b)(1)].

- The significance of a historical resource would be materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics that convey its historic significance or justify its inclusion in, or eligibility for, the NRHP, CRHP, or local registers [Section 15064.5(b)(2)(A–C)].

- It should be noted that a significant impact under CEQA would result if the resource is so affected as to no longer be eligible for listing as a historical resource (typically following the CRHR criteria for significance and integrity). Alternatively, under Section 106, a resource can be adversely affected yet remain eligible for the NRHP.

3.17.4 Affected Environment

This section describes the cultural and paleontological resources located within the APEs/study area for the UPRR/SR 99, BNSF, and Hybrid alternatives as well as those present at the proposed HMF sites.

3.17.4.1 Archaeological Resources

Most archaeological investigations within the San Joaquin Valley have been performed by Caltrans in preparation for road construction projects. Few other investigations have been conducted; as a result, little is known about this area's archaeology. Archaeological investigations within the northern San Joaquin Valley largely commenced in the 1960s (Olsen and Payen 1968, 1969; Riddell and Olsen 1969; Treganza 1960). Studies conducted along the eastern Diablo Mountain Range identified a cultural sequence similar to, but distinct from, that identified for the Sacramento-San Joaquin Delta region. Excavations conducted for reservoir construction projects in the region helped to define four distinctive cultural complexes or adaptations to the natural resources found throughout the valley and its foothills. These data indicate that Native Americans lived in the valley from about 3000 BC to AD 1850.

Throughout California, the prehistoric period covers three broad time periods that encompass similar cultural characteristics: the Paleoindian Period (ca. 10000 to 5000 BC), the Archaic Period (5000 BC to AD 500), and the Emergent or Late Prehistoric Period (AD 500 to historic contact) (Fredrickson 1973, 1974, 1994) (Table 3.17-4). The Archaic Period is further divided into the Lower (5000 to 3000 BC), Middle (3000 to 2000 BC), and Upper (2000 BC to AD 500) Sub-Periods. The drying of pluvial lakes at the transition from the Paleoindian Period to the Lower Archaic Period is one example of the variations in climate and environment that generally coincide with these broad chronological divisions throughout the state.

Table 3.17-4
Prehistoric Cultural Periods

Dates	Cultural Period	Sub-Period
AD 500 – Contact	Late Prehistoric	
2000 BC – AD 500	Archaic	Upper
3000 – 2000 BC		Middle
5000 – 3000 BC		Lower
10,000 – 5000 BC	Paleoindian	

In the northern San Joaquin Valley and adjacent Delta region, the prehistoric period is estimated to have extended from at least 12,000 years ago until historic contact, although few recorded archaeological sites in the region predate 5,000 years ago. Artifacts that are attributed by archaeologists to the Paleoindian Period have been discovered in the Central Valley in relatively few scattered surface locations. Within the northern San Joaquin Valley, fluted points have been found at only two sites, Tracy Lake in San Joaquin

County and the Wolfsen mound site (CA-MER-215) in Merced County (Dillon 2002; Heizer 1938; Peak and Weber 1978).

Archaeologist Michael Moratto has estimated that the thick deposits of Holocene alluvium (up to 30 feet) that accumulated along the lower stretches of the Sacramento River and San Joaquin River drainage systems during the last 5,000 to 6,000 years buried sites from the earlier Paleoindian and Lower Archaic Periods (Moratto 1984). Recent geoarchaeological studies support this conclusion (e.g., Rosenthal and Meyer 2004a, 2004b; White 2003). At the end of the Pleistocene (approximately 9050 calibrated [cal] BC) and the early Middle Holocene (approximately 5550 cal BC), there were periods of climate change and associated alluvial deposition throughout the central California lowlands (Rosenthal, White, and Sutton 2007). Such episodes buried many of the earliest known archaeological sites in central California. Further, a recent project along the banks of the San Joaquin River banks near the city of Fresno revealed archaeological sites buried beneath up to 3 feet of alluvium (Flint 2001). The practical implication of these conditions is that prehistoric archaeological deposits—particularly older deposits—may be buried beneath at least 3 feet of soil and not visible either on or near the current ground surface.

3.17.4.2 Historic Archaeological Resources

Historic archaeological sites in California are places where human activities were carried out during the historic period between AD 1769 and 50 years ago. Some of these sites may be the result of Native American activities during the historic period, but most are the result of Spanish, Mexican, Asian, African-American, or Anglo-American activities. Most historic archaeological sites are domestic sites, places where houses formerly stood, and they tend to contain the types of household goods reflecting the economic standing and ethnic identity of their occupants. Remains of ceramic, metal, and glass containers and dishes are most common, together with remains of the materials used in house construction—nails, brick, plate glass. Historical archaeological sites can also be nonresidential, resulting from ranching, farming, mining, manufacturing, transportation, and other commercial and industrial activities. Human burials dating to the historic period may also be considered archaeological resources.

Ethnographic Setting

The Merced-to-Fresno Section of the HST System is located entirely within an area historically occupied by the Northern Valley Yokuts, a Penutian-speaking central California group (Kroeber 1925; Wallace 1978). Ethnographers recognize three cultural-geographical divisions of Yokuts: Northern Valley, Southern Valley, and Foothill. Among these branches, the Yokuts language family included at least 11 dialects (Mithun 2001). In addition to separate cultural adaptations to somewhat differing environments, the distinction between Northern, Southern, and Foothill Yokuts is based primarily on the distribution of distinct branches of the language. The word “Yokuts” is derived from the native term for “person” in the Valley dialects (Silverstein 1978).

The core of the Northern Valley Yokuts territory was the San Joaquin River, and lands surrounding the river that extended eastward from the crest of the Coast Ranges (Diablo Range) into the Sierra Nevada foothills and southward from Bear Creek (midway between the Mokelumne and Calaveras rivers) to the upper San Joaquin River and the modern city of Fresno. Among neighboring groups were the Foothill Yokuts to the southeast, Southern Valley Yokuts to the south, Costanoan (Ohlone) to the west, Salinan to the southwest, Plains Miwok to the north, and Sierran Miwok on the east. Between the Northern and Southern Valley Yokuts, a small area may have been “unclaimed territory” (Dick-Bissonette 1994). However, it is important to note that while tribes may have had core territories, seasonal resource gathering would have taken them into territories traditionally associated with other tribal groups, and these boundaries would have shifted over time.

The pre-contact population of Northern Valley Yokuts has been estimated at 25,000 to 31,000 (Wallace 1978); disease and competition for land decimated the tribes. In 1852, the federal government planned a reservation system and called the Northern Valley Yokuts to sign one of a series of statewide treaties; however, representatives of only three Northern Valley Yokuts tribes remained. They agreed to live on a reservation in their traditional territory, but the treaty was never ratified. At present, approximately

2,000 Yokuts live on three rancherias (the Spanish word *ranchería* refers to the workers' quarters of a rancho, and has become extended into English to mean a native village): Picayune in Madera County at Coarsegold, Santa Rosa in Kings County, and Table Mountain in Fresno County near Friant, and on the Tule River Reservation, which was established in 1873 in Tulare County near Porterville (White 2009). The Picayune Rancheria is located within Foothill Yokuts territory; Table Mountain is near the division between Northern and Southern Valley Yokuts; and the others are within Southern Valley Yokuts traditional lands. Some Foothill Yokuts also live with Central Sierran Miwok on the Tuolumne Rancheria in Tuolumne County. Contemporary Yokuts tribes include the Choinumni, Chukchansi of Coarsegold, Tachi (or Tache), and Wukchumni. Approximately 600 additional Yokuts live as tribes that are not federally recognized; others are scattered throughout the state.

Archaeological Resources in the APE

There are 13 significant and/or potentially significant archaeological resources within the boundaries of the APE. Five of these sites were previously recorded, three are newly identified sites, and five are archaeologically sensitive areas identified as areas of concern through consultation with property owners and with Native American contacts. A full description of these resources is provided below.

Previously Recorded Archaeological Sites

Of the eleven previously recorded archaeological sites, two have previously been determined eligible for inclusion in the NRHP (P-24-001676/CA-MER-381/H and P-24-001686/CA-MER-383), and three are presumed NRHP and CRHR eligible under the terms of the PA (P-24-001862; P-20-002064/CA-MAD-2064H; P-20-002122/CA-MAD-2121H).

Native American Consultation

Consultation with Native American tribes identified one undocumented potential Native American burial ground and two undocumented potential Native American villages. Caltrans had been notified of the two potential Native American village locations and the potential burial ground, but they were not recorded with the SHPO and no investigations have taken place to record these potential resources. The two villages and burial ground may be part of the ethnographic village of *Kohuou*, which has never been mapped in a specific location but was historically identified in the region where the UPRR railroad and SR 99 cross the San Joaquin River (Kroeber 1925: Plate 47). These resources are considered potentially eligible for listing on the NRHP.

In addition to these identified sites, the HST alternatives cross natural drainages, which are viewed as sensitive to prehistoric archaeological resources, particularly as the watercourses get larger and more substantial because early Native Americans tended to settle near reliable perennial and seasonal water sources. Areas of sensitivity for historic-era archaeological resources are based on documented resources such as towns, railroad stations, and structures that are depicted on historic maps and plans.

Field Survey Results

During the field inventory, three potential archaeological sites were newly identified: HST-H-JL-01 on the Ave 24 Wye; HST-H-JL-02 on the BNSF Alternative; and HST-H/P-TC-01 on the Castle Commerce Center HMF site.

Archaeologically Sensitive Areas

Archaeologically sensitive areas have also been identified within the APE. These include the Kojima Development Site on the BNSF Alternative/HMF site, as well as an area near the Rotary Park in Madera on the UPRR/SR 99 Alternative. The appropriate level of subsurface testing of these locations will be conducted once design plans have advanced and permission has been granted by private landowners to conduct testing. Similarly, historic map research has identified sections of the Merced to Fresno HST as sensitive to historic archaeological resources, namely in the urban centers of Merced, Madera and Fresno. These would include properties that contained residential, industrial, commercial or transportation-related

structures and activities. Once a preferred alternative is selected and project impacts measurable, the possibility that potentially significant historic archaeological sites may be impacted can be assessed and archaeological testing methods can be established.

Additional areas of archaeological sensitivity consist of lands where the APE crosses perennial watercourses or larger seasonal drainages. Such landforms were often the focus of early Native American settlement and activities because of the proximity of reliable water. Although surface indications of prehistoric habitation may not be visible, such locations are often in depositional contexts (potential deposition of flood sediments) that can deeply bury artifacts and human remains, making their identification through archaeological surface surveys difficult or impossible. Small streams that may only flow seasonally are not as likely to contain buried archaeological sites or materials due to their general lack of reliable water and inherently less opportunity for deposition of the volume of overbank deposits that would cap archaeological sites.

To determine if any subsurface archaeological materials were present within these sensitive areas, archaeologists excavated shovel test pits and auger units at five watercourse crossings: Ash Slough, Berenda Slough, Berenda Creek, Cottonwood Creek, and Dry Creek (those where access was granted by the landowner). The number of excavated shovel test pits and auger units varied according to the landform configuration, size of the APE, and accessibility; the excavations were placed at 50- to 100-foot intervals where the landform generally looked undisturbed, where dense vegetation did not block access, and where, in their professional judgment, archaeologists felt the most likely locations for intact resources could be found. None of the excavations resulted in cultural material discoveries. Geoarchaeological studies will be conducted at those river and stream crossings once a Preferred Alternative has been selected, and their potential to contain buried archaeological deposits will be more fully assessed at that time. Until those studies are conducted, all river, creek and slough crossings will be considered archaeologically sensitive.

Table 3.17-5 lists archaeological sites and sensitive areas identified within the APE. Known archaeological properties within the APE that could not be evaluated formally are presumed to be potentially eligible for the NRHP, in accordance with Appendix D of the PA. These are not illustrated on figures to protect the resources. The table also includes the potentially eligible prehistoric resources adjacent to the APE. The table does not include stream, river and slough crossings as a geoarchaeological assessment will be required to determine their potential to contain archaeological deposits.

Table 3.17-5
Archaeological Resources and Sensitive Areas within or Adjacent to the APE[a]

Resource	Description	Eligibility for NRHP	Alternatives			
			UPRR/ SR 99	BNSF	Hybrid	HMF
P-24-001862	Prehistoric artifact scatter	Unevaluated; Potentially eligible	X	X		Castle Commerce Center
P-24-001676, CA-MER-381/H [a]	Prehistoric artifact scatter/ Historic remains of the town Athlone	Eligible	X		X	
P-24-001686, CA-MER-383 [a]	Prehistoric artifact habitation site with burials	Eligible	X		X	

Resource	Description	Eligibility for NRHP	Alternatives			
			UPRR/ SR 99	BNSF	Hybrid	HMF
P-20-002064, CA-MAD-2064H	Berenda Station	Unevaluated; Potentially eligible	X (Ave 24 Wye)			
P-20-002122, CA-MAD-2121H	Artifact scatter assoc. with Chinese railroad camp	Unevaluated: Potentially eligible	X			
HST-H-JL-01	Historic homestead with foundations, trash deposit and scatter	Unevaluated: Potentially eligible	X (Ave 24 Wye)			
HST-H-JL-02	Historic trash scatter	Unevaluated: Potentially eligible		X		
HST-H/P-TC-01	Historic foundations, trash deposit/ Prehistoric artifact scatter	Unevaluated: Potentially eligible	X			Castle Commerce Center
Reported burial ground	Prehistoric burial	Unevaluated: Potentially eligible	X	X	X	
Reported village #1[a]	Prehistoric village	Unevaluated; Potentially eligible	X	X	X	
Reported village #2 [a]	Prehistoric village	Unevaluated; Potentially eligible	X	X	X	
Prehistoric artifact finds (Kojima Development)	Prehistoric artifact scatter	Unevaluated; Potentially eligible				Kojima Development
Rotary Park area, Madera	Prehistoric artifact find	Unevaluated; Potentially eligible	X			

[a] Indicates a site that is currently described to be adjacent to, but may be within, the APE.

Sources: Data provided by the Central California Information Center in 2009; data provided by the South San Joaquin Valley Information Center in 2009, 2010, and 2011.

P-24-001862 – UPRR/SR 99 Alternative, BNSF Alternative, Castle Commerce Center HMF

This site, along the lead tracks to the Castle Commerce Center HMF, was originally recorded in 2007. At that time, it consisted of artifacts in a plowed field that have been removed from their original depositional context. Those artifacts included a pestle, bowl mortars, and a river cobble that has been battered, evidence that it was used by Native Americans. The artifacts appear to have been removed

from their original context; they do not appear to be unique examples of their type and do not meet basic significance criteria for associations or data values. However, this site cannot be evaluated at this time due to lack of information. While archaeologists were conducting field surveys, they could not find any artifacts within the APE at these locations. However, there may be an as-yet unidentified subsurface component to the site. A program of subsurface testing is needed to identify any such deposits and assess their condition. As a result, the site is presumed potentially eligible.

P-24-001676 (CA-MER-381/H) – UPRR/SR 99 Alternative and Hybrid Alternative

This site includes a prehistoric component and remnants of the town of Athlone, identified during earlier surveys, focused to the east of SR 99. This site could not be accessed during the current surveys. Previous investigations at this site (SRI 2002; U.S. Department of Transportation et al. 2006) indicate that while extensive disturbances have occurred there, the discovery of in-situ artifacts up to 2 meters below the present-day ground surface suggests the site retains considerable data potential. Those archaeologists also noted that the prehistoric deposit appeared to continue underneath SR 99, likely along the original course of Deadman Creek. It is presumed that this site extends into the HST APE. The U.S. Department of Transportation and others (2006) suggested that site CA-MER-381 is eligible for NRHP/CRHR listing and received SHPO concurrence with that recommendation.

P-24-001686 (CA-MER-383) – UPRR/SR 99 Alternative and Hybrid Alternative

The Wilson Site is a large prehistoric habitation site with Native American burials that may encroach, if site boundaries extend far enough to the southwest, into the APE for UPRR/SR 99 and Hybrid alternatives south of Merced. The site is depicted on the northeast side of the UPRR railway, SR 99, and the APE. Previous exploration of the site stopped at the highway, amidst indications that the site deposit was diminishing; however, it is possible that subsurface exploration would identify site elements extending to the west beyond the highway and the UPRR railway. In the late 1970s, an archaeological excavation at the site recovered multiple burials; although orchard development in the area may have removed much of the surface portion of the site, intact components were found to extend to at least 1.4 meters below surface. Work done for Caltrans in 2001 included the excavation of multiple trenches and test units in and around the Wilson Site, but again, the work focused on the northeast side of SR 99; the site record form acknowledged that the site boundaries are unknown (SRI 2001). The site boundary indicated by SRI extends up to the edge of SR 99 (SRI 2001:5). Because of the presence of human remains and its data potential, site CA-MER-383 is potentially eligible for listing in the NRHP under Criterion D or the CRHR under Criterion 4. The Plainsburg/Arboleda Freeway Project Environmental Assessment (U.S. Department of Transportation et al. 2006) evaluated this site, found that it was eligible for listing in the NRHP, and received SHPO concurrence with that finding.

P-20-002064 (CA-MAD-2064H) – UPRR/SR 99 Alternative

P-20-002064 (CA-MAD-2064H) consists of the archaeological vestiges of the Berenda Station, a rail depot on the Southern Pacific line used from 1872 until the late 1950s. When documented in 1993, the site covered approximately 70 acres with six planted nonnative trees and nine archaeological features: five building foundations, two demolished structures, and two moderately dense concentrations of cultural materials. During a site visit in August 2010, the site appeared to have been altered further, as most of the features documented in 1993 were not visible. Access to the property was denied (the assessment was performed by observing from an adjacent road), and so it was unclear whether the 1993 structural elements were missing or merely buried. A program of subsurface testing is needed to identify any deposits on this site and assess their condition. As a result, the site is presumed potentially eligible.

P-20-002122 (CA-MAD-2121H) – UPRR/SR 99 Alternative

P-20-002122 (CA-MAD-2121H) is a highly disturbed scatter of artifacts related to a Chinese railroad labor camp. The 1993 DPR form clearly depicted the locations and processes by which the original deposit was used as borrow material to build up the railroad berm. The 1993 documentation also stated that the bulk of this historic debris had been removed when the railroad berm was constructed, leaving only a scatter of artifacts in the adjacent vineyard. It may also be surmised that vineyard construction would have disturbed site deposits. Since 1993 when the site was originally documented, a pipeline has been constructed through what remained of the site, leaving behind a small remnant berm. It is possible that

the original source of the artifacts remains nearby and may retain sufficient integrity to be considered for the NRHP or CRHR; however, the location of this site remains unknown and access was denied. A program of subsurface testing is needed to identify any deposits on this site and assess their condition. As a result, the site is presumed potentially eligible.

HST-H-JL-01 – Ave 24 Wye

This site consists of the remains of an early 20th century homestead that contains four concentrations of domestic debris and features, including a concrete foundation and collapsed walls, fence posts and wiring, concrete pipes, piles of disarticulated lumber, household debris, and other miscellaneous items. It is located on the banks of Berenda Slough, adjacent to a plowed agricultural field. No historical association for these materials has, as yet, been made, and the possibility for the presence of subsurface features such as privies and/or wells is unknown. Archaeological testing in this area will be conducted once permission has been granted by the landowner. As a result, the site is presumed potentially eligible.

HST-H-JL-02 – BNSF Alternative

The site is situated on a recently mechanically cleared area, composed of sparse to moderately dense vegetation. There are large eucalyptus trees present along the southwest quadrant of the site and local grasses throughout. Disturbances within the site consist of the mechanical grading or clearing of the area, construction activities associated with the repair of the railroad right-of-way, alluvial activities, miscellaneous construction or demolition debris (e.g., old railroad ties), and household appliances (e.g., a chair). The site is just east of the Fresno River. Historical remains within the site consist of kitchen, household, building, and consumer items. These are composed of ceramic, glass, and concrete items. Ceramic items include electrical insulators, miscellaneous ceramic fragments including ironstone and porcelain, and common building brick fragments. Also observed within the site boundaries are colorless, amber, cobalt blue, and milk glass jar and bottle fragments that are complete and or fragmentary. The site also contains numerous concrete and asphalt fragments that are associated structures of unknown purpose. No features were observed. The observed artifacts provide a general timeframe of very late 19th to mid-20th century; the sample is indicative of a domestic site. No historical association for these materials has, as yet, been made, and the possibility for the presence of subsurface features such as privies and/or wells is unknown. The disturbed context in which these artifacts were observed makes it difficult to assess what they represent as well as their potential significance. The variety and quantity of artifacts found on the ground surface indicate a domestic site. Intact features or additional deposits may be located beneath the large pile of bridge timbers that dominate the property. Archaeological testing in this area will be conducted once permission has been granted by the landowner. As a result, the site is presumed potentially eligible.

HST-H/P-TC-01 – UPRR/SR 99 Alternative, Castle Commerce Center HMF

This site is located on land formerly a part of Castle Air Force Base, which was closed and transferred to private use, circa 1994. Site HST-H/P-TC-01 consists of a number of features and artifacts likely associated with Base operations occurring more than 50 years ago (1942 to 1961) during World War II and the Early Cold War Period. One feature consists of a large, apparently buried, historical trash deposit or dump, indicated by 13 concentrations of historical refuse including 32 identifiable artifacts associated with the 1950s (including a service identification *dog tag*). Elsewhere several water conveyance features (drainage channels, with associated bridges and culverts), foundations and ponds associated with a sewage treatment plant, an oval curb likely from an abandoned running track, and various other structural remains, some possibly 50 years old and others likely of more recent vintage are also present.

Also observed, in another area of the site, were two pieces of prehistoric lithic (volcanic) debitage. It should be noted that the location of these prehistoric materials is in proximity to a previously recorded prehistoric archaeological resource, P-24-001862, situated to the south along the south side of North Santa Fe Avenue and the UPRR railway (Darcangelo 2007). While in some proximity, no definite association for these artifacts can be made to P-24-001862, and access to that site was denied for this project. It should also be noted that several pieces of prehistoric debitage were encountered in subsurface geoarchaeological investigations in an adjacent area of the base to the north (outside the HST APE) during archaeological studies conducted to satisfy NHPA requirements under Section 106 for the

disposal and reuse of the base (Trnka et al. 1994:5-27). Archaeological testing in this area will be conducted once permission has been granted by the landowner. As a result, the site is presumed potentially eligible.

Undocumented Human Burials – Along all HST Alternatives

According to oral accounts, human remains have been uncovered during past construction activities at a location south of the San Joaquin River and possibly within the APE. Although specific locations for burials could not be determined, finds of human remains have been reported by construction workers who built various facilities in the area. The reported presence of human remains, the likely presence of an accompanying site, and the data values and cultural values attached to such a location indicate that this site would be eligible for listing on the NRHP or CRHR. A TCP may be defined by traditional cultural significance, meaning beliefs, customs, and practices of a living community that have been passed down through the generations. The traditional cultural significance of a historic property is then the significance derived from the role the property plays in a community's beliefs, customs, and practices and its import in maintaining the continuing cultural identity of the community. A TCP is then identified by the community which attaches relevance to the location. It is possible that at some point in the future this potential burial location may be formally labeled as a TCP by the current Native American community. Under the terms of the PA, this resource is presumed potentially eligible.

Two Reported Villages (ethnographic village of Kohuou) – Along all HST Alternatives

There are two possible locations for this archaeologically sensitive area, identified by the cultural resources representative for the Dumna Wo-Wah Tribe as areas along the San Joaquin River where numerous early Native American materials had been uncovered in the past. Midden soils are reported to be found throughout this area and could represent important habitation sites possibly containing human remains. Although these archaeologically sensitive areas remain undocumented, the locations may contain important scientific data and are considered eligible for NRHP/CRHR listing. In addition, while they have not been labeled as such during Native American consultation to date, these sites may represent TCPs if they continue to play a part in the current-day community's culture and practices and so may be eligible for listing on the NRHP or CRHR on that basis as well. Under the terms of the PA, this resource is presumed potentially eligible.

Kojima Property – BNSF Alternative/HMF Site

This parcel, located on the BNSF Alternative alignment, is a candidate for the location of a HMF. During archaeological surveys of the property, which borders Berenda Slough, archaeologists were informed that prehistoric artifacts had been found in the general project vicinity. However, specific artifact locations could not be identified, no artifacts were visible during the surface survey, and the property owner would not agree to any subsurface testing, including the excavation of shovel test pits. Because of the lack of information, it is currently impossible to determine whether or not this site occurs within the HST APE or whether it possesses values that may make it eligible for listing on the NRHP or CRHR. Once project design has advanced to a point where the APE has been definitively established in this area and property access has been obtained, archaeological testing should proceed to determine the presence or absence of archaeological deposits. As a result, the site is presumed potentially eligible.

Rotary Park – UPRR/SR 99 Alternative

A single prehistoric artifact was found within the UPRR route right-of-way, near the Rotary Park in the City of Madera adjacent to a recent fiber optic cable trench. Under the terms of the PA, isolated artifacts such as this one are not recorded as part of the HST project; however, the location of the tool on the surface in the vicinity of the fiber optic trench could indicate subsurface deposits in the area, containing much greater quantities of artifacts. Archaeological testing in this area will be conducted once permission has been granted by the landowner. As a result, the site is presumed potentially eligible.

3.17.4.3 Historic Architectural Resources

Historic properties and historical resources are elements of the built environment that are listed in, or eligible for, the NRHP or CRHR. These elements reflect important aspects of local, state, or national

history and can be buildings, structures, objects, sites, districts, or landscapes. Examples of the types of historic properties or historical resources within the APE include dwellings, industrial buildings, commercial buildings, downtown districts, farms, canals, rural landscapes, dams, bridges, roads, and other facilities that were built, operated, and previously gained historical significance.

The NRHP uses the National Register eligibility criteria (36 CFR §60.4) to evaluate significance, described in 3.17.2, Laws, Regulations, and Orders. In addition to being significant under one or more of the criteria, a historic property must also possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Historic Architectural Resources Context

Although a series of expeditions by DeAnza, Moraga, Viader, Palomares, and others entered and explored parts of the northern San Joaquin Valley during the Spanish Period (1769 to 1822), explorers and other immigrants did not settle in this interior valley until the Mexican Period (1822 to 1848). The early settlements were connected by trails that were also used by overland travelers, and many of the trails were the basis for future transportation routes.

At the start of the American Period (1848 to present) when California and several other western states became territories of the United States, the discovery of gold in 1848 at Sutter's Mill near Sacramento enticed thousands of settlers and immigrants to pour into the state. However, those individuals largely settled in larger northern urban areas such as San Francisco and the foothill regions. This influx of new settlers continued particularly after completion of the transcontinental railroad in 1869.

During the Gold Rush years of the 1850s and 1860s, immigrants also traveled to the southern Mother Lode in the northern San Joaquin Valley. Many headed for the gold fields, but enterprising individuals and businesses met the miners' increasing demand for food and supplies, boosting the establishment of farms, ranches, and small towns along navigable waterways and tributaries. The cattle business and grain farming were particularly suited to the region's soils and climate, and in the 1870s, the valley became the center of California's wheat belt.

It was not until after the Central Pacific Railroad constructed its Southern Pacific line through the San Joaquin Valley in 1870 that the regional population and economy grew significantly. The railroad connected the valley to Sacramento and San Francisco, and revolutionized the transportation network, passenger travel, and the ability of farmers and ranchers to sell their goods to distant markets. The railroad established stops and sidings along the tracks, forming the basis for settlement and growth of local farms and ranches, small communities, and later urban centers.

Irrigation transformed the agricultural potential of the drier portions of northern San Joaquin Valley. Irrigation fostered an era of extensive wheat farming throughout the San Joaquin Valley. By 1887, water from canal systems irrigated more than 600,000 acres in Fresno County. While ranching and the raising of stock and dairy cattle remained an important industry in the valley, with the expansion of large-scale irrigation in the early 1900s came the production of a variety of fruits and vegetables, vineyards, alfalfa, and cotton, among other crops. Compared to other parts of the state, the San Joaquin Valley continues to be a powerful economic center for the agricultural and livestock industries, and remains more rural in character.

The popularity of the automobile ushered in the establishment of a state highway system in the early 1900s. Within the interior Central Valley, a north-south highway was planned to pass through as many population centers as possible. Corresponding to today's SR 99, widening of the first paved road segments occurred in the 1920s and 1930s, and additional engineering features such as bridges were also upgraded over time.

This improvement in surface transportation encouraged the growth of existing and new residential, commercial, and industrial developments (i.e., neighborhoods, shopping centers, and light industry) along SR 99, particularly during the latter half of the 20th century. SR 99 was completed as a four-lane expressway between Sacramento and Los Angeles in the 1950s. Aided by the passage of the Federal

Highways Act in 1944 and Collier-Burns Act in 1945, this era also witnessed the development of the modern freeway system, with related bridge and grade separation improvements (AECOM 2010a).

Architectural resources including buildings, structures, objects, sites, landscapes, and districts from the historic period can consist of many architectural and functional types, including dwellings, stores, offices, factories, barns, bridges, roads, and other facilities that served residential, commercial, industrial, agricultural, transportation, and other functions during the historic period (more than 50 years ago, or prior to 1960). General characterizations can be made of commercial and industrial buildings, dwellings (both urban and rural), roads, railroads, transmission lines, and water conveyance systems that reflect the historic context discussed above for the northern San Joaquin Valley, particularly Merced, Madera, and Fresno counties, as well as the major themes of the history of the region outlined in that section.

Within or near the Merced to Fresno corridor of the HST project, by far the largest concentration of historic-era buildings and structures is in the urban centers of Fresno, Madera, and Merced. Resources of all the functional types occur within the greater Merced to Fresno region. A certain number of historic architectural resources also appear in other city centers along the route, Atwater and Chowchilla, and to a lesser extent the rural countryside.

Historic Architectural Resources in the APE

Forty-six significant historic architectural resources have been identified within the APE. Of these resources, 19 within the APE were listed, have been determined eligible for listing, or appear to be eligible for listing in the NRHP, pending SHPO concurrence. These 19 historic properties are also considered to be historical resources for the purposes of CEQA. The remaining 27 historic architectural resources do not meet the NRHP criteria, but are considered historical resources for the purposes of CEQA. All of these resources are reported in the HPSR (Authority and FRA 2011a), as required in the PA. The 46 historic architectural resources that are either historic properties (Section 106) or historical resources (CEQA), or both, are shown in Table 3.17-6.

The vast majority of the built environment survey population dates to the twentieth century. About 13% of the 46 historic properties/historical resources listed below were constructed during the nineteenth century, specifically between about 1873 and 1898 (see Table 3.17-6). Thirty-three percent of the survey population was built between 1900 and 1919, meaning that more than half of the surveyed resources date to the mid twentieth century between 1920 and 1960.

Designed in a range of styles and using various materials, most of the historic architectural resources in the APE have been altered over time, as continuous use and changing stylistic and functional mandates required new forms. Most residential and railroad-related buildings dating to the nineteenth century are wood frame and display Italianate and Queen Anne styles typical of the Victorian Era, while commercial buildings are often brick and feature more restrained Classical details. Commercial buildings continued to feature modest Classical features into the twentieth century, while residential buildings dating after 1900 are largely wood frame construction, with the few exceptions in masonry. Rural homes built between 1900 and the 1930s in the Merced to Fresno Section were generally one to two stories high, in either modest bungalow or Spanish Eclectic styles. Urban and suburban single-family homes from the same time period feature the same architectural styles, but tend to be one-story. The mid-twentieth century brought Ranch and Minimal Traditional styles to the residential construction in the APE in both rural and urban areas.

The public, institutional, and commercial buildings dating to the 1930s and 1940s in the APE are concrete or masonry, frequently with Art Moderne styling. The development of schools, government centers, and research facilities in the study area was a response to rising populations and new mandates for city, county, and state governance, as well as the importance of agricultural technology, during the post-war era. These buildings and structures were often concrete or metal frame, and either International or

Modern in style, or simply utilitarian. All of these property types convey the general development history in and near the APE (Authority and FRA 2011a).[3]

The surveys conducted for the Merced to Fresno Section also identified numerous built environment resources that were more than 50 years old at the time of survey, but did not meet the criteria for listing in the NRHP or CRHR at the local, state, or national level. The evaluations of these resources are presented in the HASR (Authority and FRA 2011b), as required in the PA.

The historic architectural resources addressed in the HPSR (Authority and FRA 2011a) and the HASR (Authority and FRA 2011b) were evaluated using the NRHP and CRHR significance criteria in compliance with the PA.[4] The 430 historical architectural resources reported in the HASR do not appear to be eligible for listing in the NRHP, pending SHPO concurrence. None of these resources is eligible for listing in the CRHR, none is listed or eligible for listing in local government registers or inventories, and as such, none is considered an historical resource for the purposes of CEQA.

Figures 3.17-1 through 3.17-4 depict the location of potentially significant historic resources within the APE identified during the current survey. Table 3.17-6 lists significant historic architectural resources and indicates in which alternative(s) they are located.

Each of the three main alternatives (UPRR/SR 99, BNSF, and Hybrid) join together into a single common alignment between the San Joaquin River and the City of Fresno. This common alignment connects to two station alternatives in Downtown Fresno (Mariposa Street Station Alternative, Kern Street Station Alternative). Since the three main alternatives share a common route for much of the project length, the majority of the resources surveyed and evaluated as part of the project fall within all three of these alternatives. Resources that are only located within a single alternative are described, below, separately.

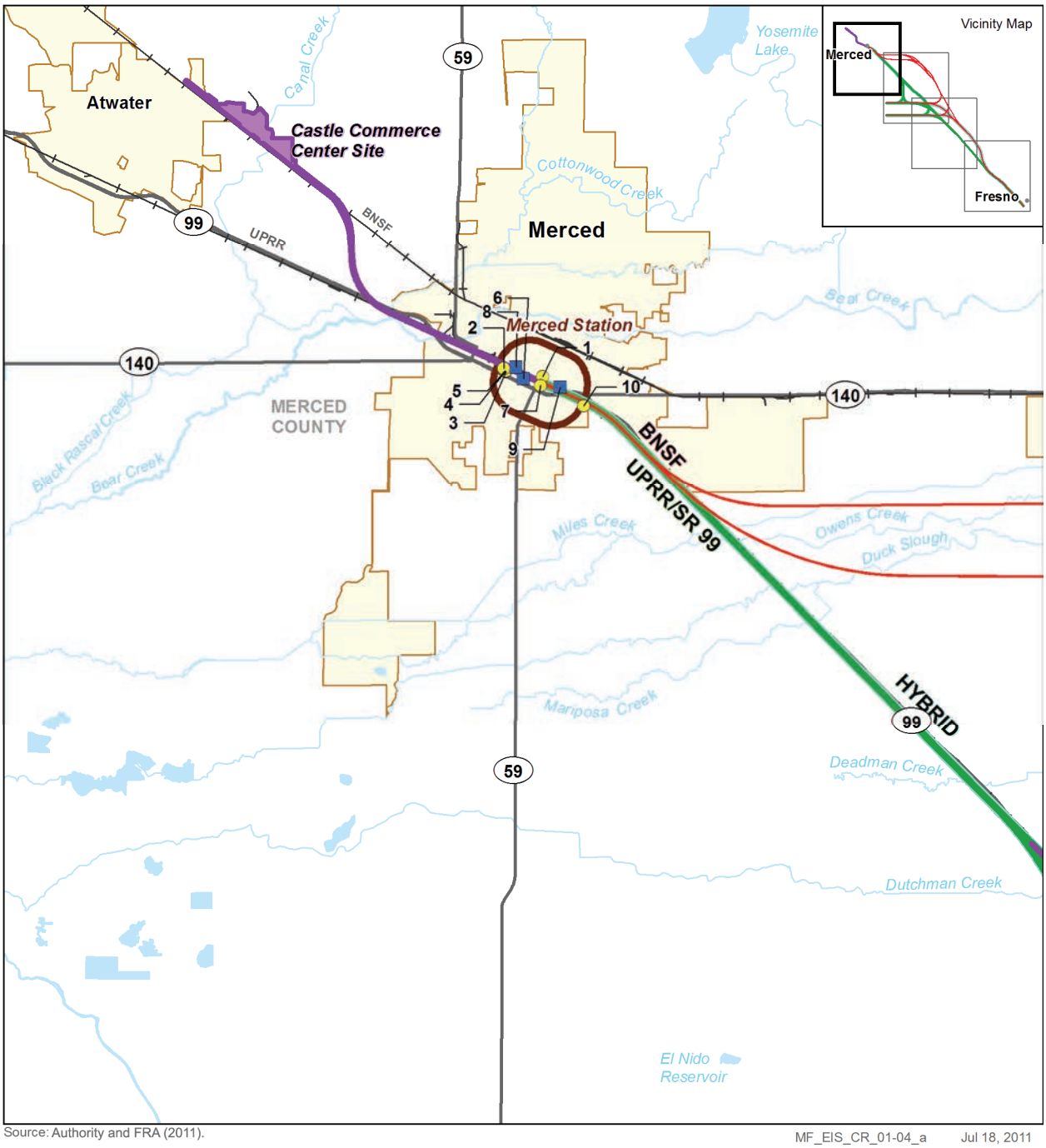
Forty-four significant resources are located within the APEs of the UPRR/SR 99 Alternative, the Hybrid Alternative, and the BNSF Alternative (where they share common routes). Two significant resources are located within the APE of only the UPRR/SR 99 Alternative. No significant resources are located within the APE of only the Hybrid Alternative. No significant resources are located within the APE of only the BNSF Alternative. No historic architectural resources were identified near or within any of the proposed HMF sites.

During the course of survey efforts, numerous types of resources are considered for the potential to qualify as significant historic architectural resources. Resource types that are continually explored for identification and significance consideration include districts, landscapes, and objects. Review of linear features such as railroads and irrigation works that transcend the current APE limits or identification exemptions noted in the PA was also performed.

The 46 historic architectural resources are described in the following paragraphs, and are presented by alternative, from north to south. To differentiate between the types of historic status, descriptions that are indented and bulleted are resources considered historic for the purposes of CEQA; descriptions of historic properties eligible for or listed in the NRHP are not indented or bulleted, but the property name, parcel number, and address are underlined. These resources (#1 to #46) are illustrated on Figures 3.17-1 through 3.17-4.

[3] Full descriptions and evaluations of the survey population addressed in the HPSR (Authority and FRA 2011a) are included in that document, as well as DPR 523 forms for each historic architectural resource.

[4] Full descriptions and evaluations of the historic architectural resources addressed in the HASR (Authority and FRA 2011b) are included in that document, including DPR 523 forms for each resource.



Source: Authority and FRA (2011).

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- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Station Study Area
- City Limit
- County Boundary
- Railroad
- Potentially Affected CEQA Historical Resource
- Potentially Affected NRHP Listed or Eligible Historic Property

Figure 3.17-1
Cultural Resources in the Merced Project Vicinity

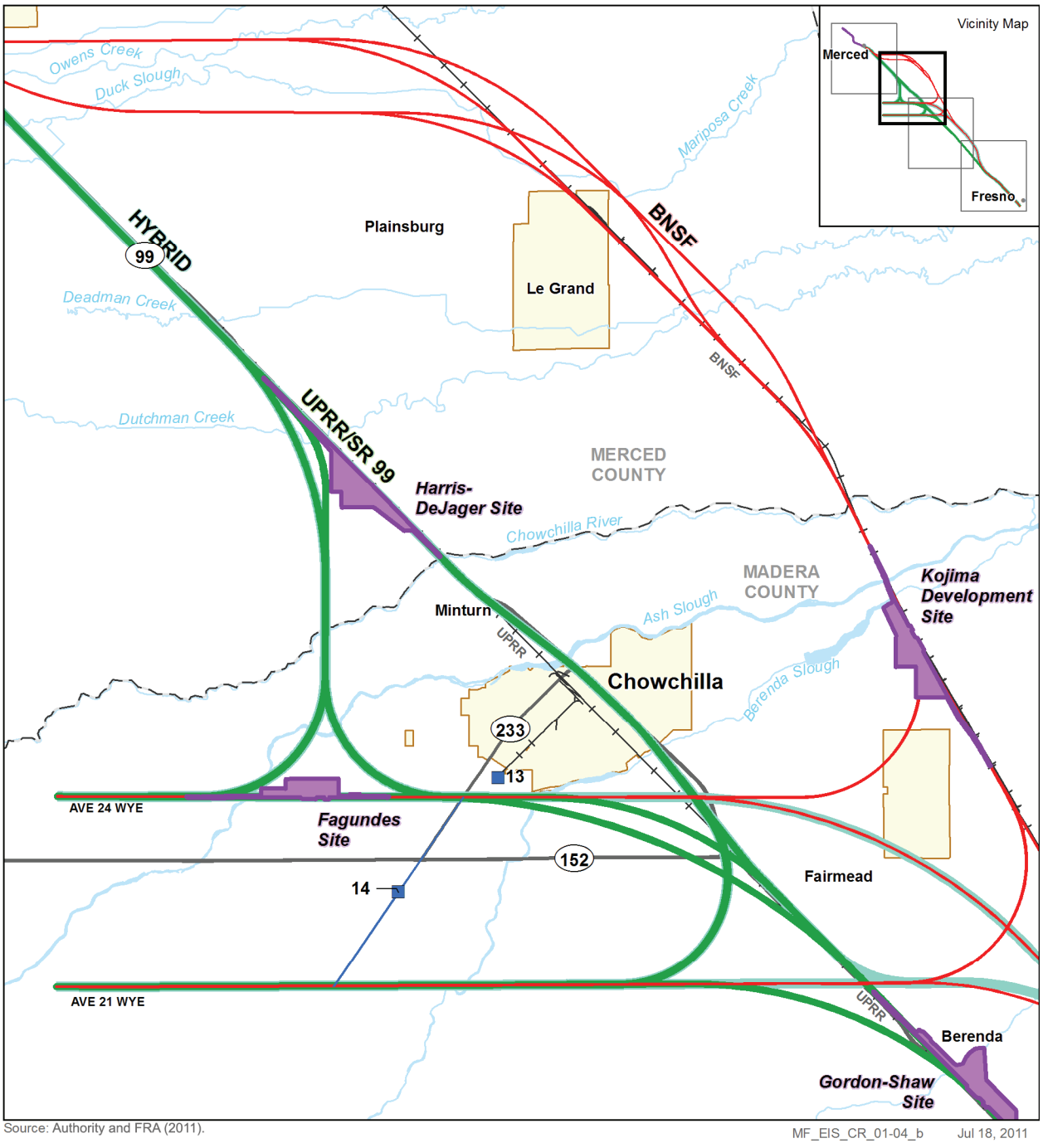

Figure 3.17-2
Cultural Resources in the Chowchilla Project Vicinity

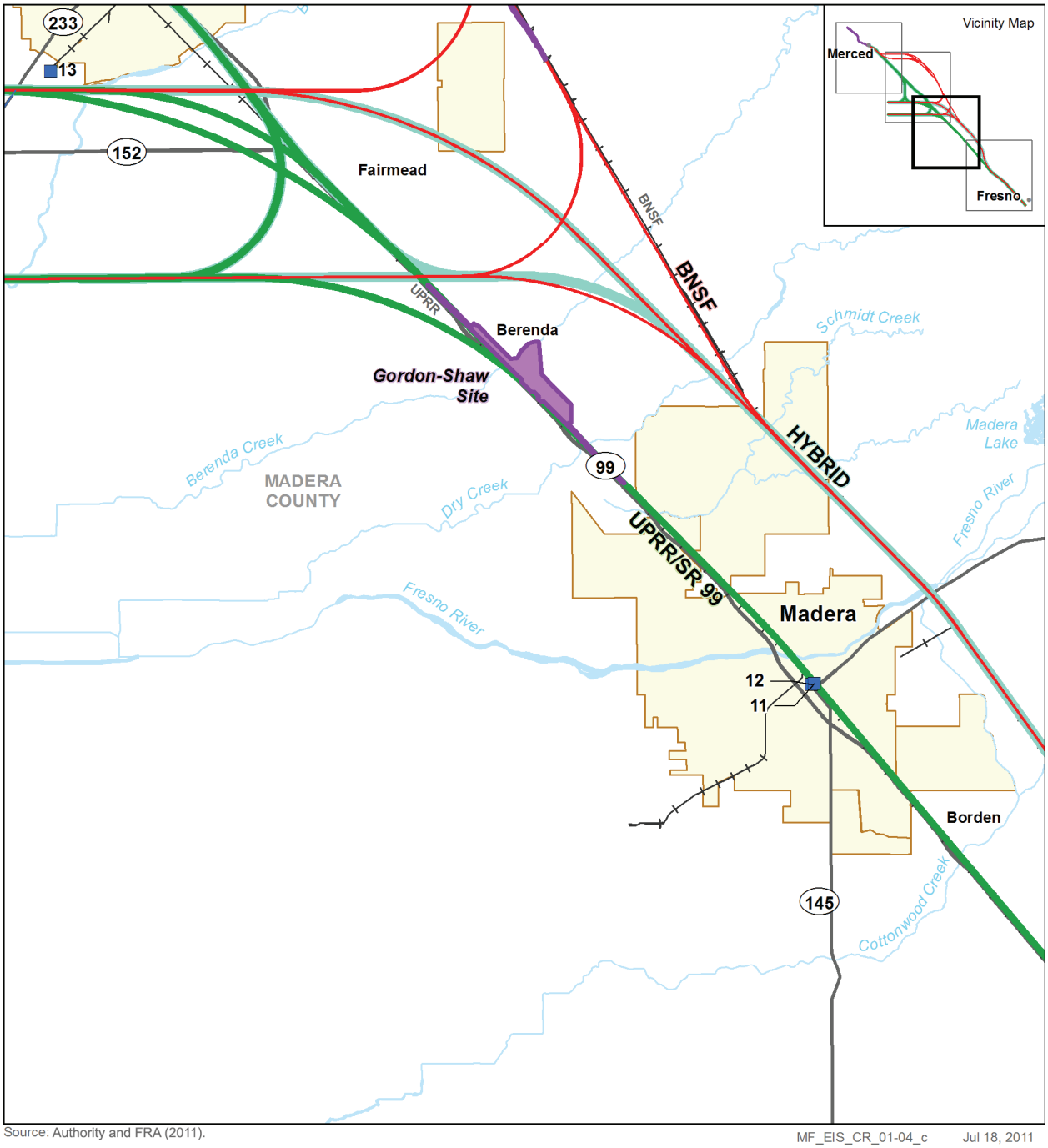

Figure 3.17-3
Cultural Resources in the Madera Project Vicinity

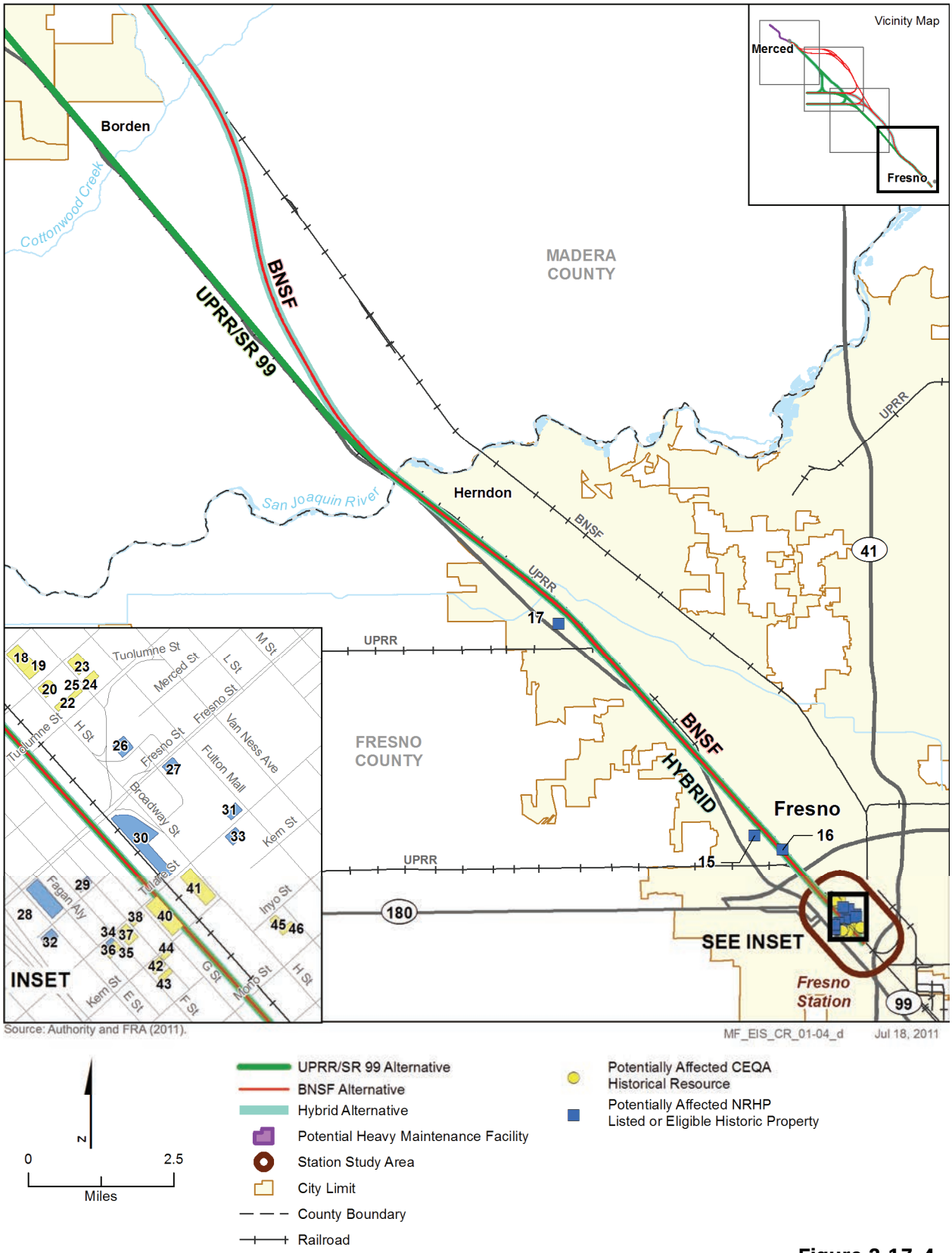

Figure 3.17-4
Cultural Resources in the Fresno Project Vicinity

Table 3.17-6
Significant Historic Architectural Resources by Alternative

Map ID	APN	Name/Address	County	Built	UPRR/SR 99 Alternative		BNSF Alternative		Hybrid Alternative			UPRR/SR 99, BNSF, Hybrid		
					North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
1	031-154-011	Oy Kuong Laundry/Ranch Restaurant 245 W 16th Street	Merced	1925	X	NA	X	NA	X	NA	NA	X	NA	NA
2	031-211-007	912 W 15th Street	Merced	1890	X	NA	X	NA	X	NA	NA	X	NA	NA
3	031-213-015	Caswell T. Hunter Home 845 W 14th Street	Merced	1895	X	NA	X	NA	X	NA	NA	X	NA	NA
4	031-213-016	Frank Bacigalupi Home 849 W 14th Street	Merced	1910	X	NA	X	NA	X	NA	NA	X	NA	NA
5	031-213-017	Jacob Schafer Home 861 W Q St	Merced	1918	X	NA	X	NA	X	NA	NA	X	NA	NA
6	031-231-005	PG&E Building 560 West 15th Street	Merced	1915	X	NA	X	NA	X	NA	NA	X	NA	NA
7	031-243-004	Merced Beverage and Supply Company 210 W 15th Street	Merced	1924	X	NA	X	NA	X	NA	NA	X	NA	NA
8	031-360-001	Merced Southern Pacific Company Passenger Station 740 W 16th Street	Merced	1926	X	NA	X	NA	X	NA	NA	X	NA	NA
9	034-205-005	KAMB (California Highway Patrol) Building 90 E 16th Street	Merced	1933	X	NA	X	NA	X	NA	NA	X	NA	NA
10	035-160-010	De Long Memorial Park/Evergreen Memorial Park 1480 B Street	Merced	1873	X	NA	X	NA	X	NA	NA	NA	NA	NA
11	007-101-016	Madera Southern Pacific Railroad Station 120 N E Street	Madera	1927	X	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	007-101-020	Valley Feed & Fuel Co. 121 Gateway Drive	Madera	Ca. 1920s	X	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	026-233-011	24302 Road 15	Madera	Ca. 1880s	NA	X	NA	X	NA	X	NA	NA	NA	NA
14	No APN	Robertson Blvd. Tree Row (SR 233)	Madera	1912-1913	NA	X	NA	X	NA	X	X	NA	NA	NA
15	450-020-08	Roeding Regional Park (Roeding Park)	Fresno	Ca. 1910	X	NA	X	NA	X	NA	NA	NA	NA	NA
16	No APN	Weber Avenue Overcrossing (Bridge 42C0071)	Fresno	1952	X	NA	X	NA	X	NA	NA	NA	NA	NA

Map ID	APN	Name/Address	County	Built	UPRR/ SR 99 Alternative		BNSF Alternative		Hybrid Alternative			UPRR/SR 99, BNSF, Hybrid		
					North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
17	510-233-03	Forestiere Underground Gardens 5021 W Shaw Avenue	Fresno	1906	X	NA	X	NA	X	NA	NA	NA	NA	NA
18*	466-204-07	Budd & Quinn Showroom/Fresno Body & Fender Works 1560 H Street	Fresno	1929, 1937	X	NA	X	NA	X	NA	NA	NA	NA	NA
19	466-204-06	Budd & Quinn 1514 – 1518 H Street	Fresno	1922	X	NA	X	NA	X	NA	NA	NA	NA	NA
20	466-205-14	H.E. Jaynes & Son 1454 H Street	Fresno	1944	X	NA	X	NA	X	NA	NA	NA	NA	NA
21	466-205-13	H.E. Jaynes & Son 1452 H Street	Fresno	1928	X	NA	X	NA	X	NA	NA	NA	NA	NA
22	466-205-11	Benham Ice Cream/Dale Bros. Coffee Building; Dale Bros. Coffee Sign 1420 H Street	Fresno	1902, 1913, 1923, 1937, 1940	X	NA	X	NA	X	NA	NA	NA	NA	NA
23	466-202-19 466-202-20	Parker Nash Building 1460-1462 Broadway	Fresno	1913	X	NA	X	NA	X	NA	NA	NA	NA	NA
24	466-202-07	1416 Broadway	Fresno		X	NA	X	NA	X	NA	NA	NA	NA	NA
25	466-205-05	Mayflower Hotel 1415-1417 Broadway	Fresno		X	NA	X	NA	X	NA	NA	NA	NA	NA
26	466-214-01	Hotel Fresno 1257 Broadway	Fresno	1912	X	NA	X	NA	X	NA	NA	NA	X	X
27	466-212-12	Crest Theater 1160 Broadway Plaza	Fresno	1949	NA	NA	NA	NA	NA	NA	NA	NA	X	NA
28	467-065-08	Fresno Fire Department Station No. 3 1406-1430 Fresno Street	Fresno	1938	X	NA	X	NA	X	NA	NA	NA	X	X
29	467-062-08	Basque Hotel/EA Walrond Building 1102 F Street	Fresno	1922	X	NA	X	NA	X	NA	NA	NA	X	NA
30	467-030-31	Southern Pacific Railroad Depot 1033 H Street	Fresno	1889	X	NA	X	NA	X	NA	NA	NA	X	X
31	468-284-42	Bank of Italy 1015 Fulton Mall	Fresno	1918	X	NA	X	NA	X	NA	NA	NA	NA	NA
32	467-103-01	First Mexican Baptist Church 1061 E Street	Fresno	1924	NA	NA	NA	NA	NA	NA	NA	NA	X	X
33	468-284-41	Radin-Kamp Department Store 959 Fulton Mall	Fresno	1925	X	NA	X	NA	X	NA	NA	NA	NA	NA

Map ID	APN	Name/Address	County	Built	UPRR/ SR 99 Alternative		BNSF Alternative		Hybrid Alternative			UPRR/SR 99, BNSF, Hybrid		
					North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
34	467-074-01	Bank of America 947-951 F Street	Fresno	1908	X	NA	X	NA	X	NA	NA	NA	NA	NA
35	467-074-02 East Side	Peacock Department Store 937-945 F Street	Fresno	1926	X	NA	X	NA	X	NA	NA	NA	NA	NA
36	467-074-02 West Side	H. Sargavak Building 942 Fagan Alley	Fresno	Ca. 1925	X	NA	X	NA	X	NA	NA	NA	NA	NA
37	467-071-16	938-952 F Street	Fresno	Ca. 1898-1906, ca. 1925	X	NA	X	NA	X	NA	NA	NA	X	X
38	467-071-01	1528 -1548 Tulare Street	Fresno	1895, 1930, 1945	X	NA	X	NA	X	NA	NA	NA	X	X
39	467-071-02	Haruji Ego Family Building 956 China Alley	Fresno	Ca. 1900	X	NA	X	NA	X	NA	NA	NA	X	X
40	467-040-12	Pacific Coast Seeded Raisin Company/Del Monte Plant No 68 1626 Tulare Street	Fresno	1906, 1946	X	NA	X	NA	X	NA	NA	NA	X	X
41	467-040-24	Hobbs Parsons Produce Building 903 – 911 H Street	Fresno	1903	X	NA	X	NA	X	NA	NA	NA	X	X
42	467-072-08	Dick's Shoes Building (Dick Avakian Shoe Repair) 1522-1526 Kern Street	Fresno	1923	X	NA	X	NA	X	NA	NA	NA	X	X
43	467-072-06	Azteca Theatre 836-840 F Street	Fresno	Ca. 1950	NA	NA	NA	NA	NA	NA	NA	NA	NA	X
44	467-072-01	Komoto's Department Store 1536-1542 Kern Street	Fresno	1901 ca. 1918	X	NA	X	NA	X	NA	NA	NA	X	X
45	468-286-11	Liberty Laundry 1830 Inyo Street	Fresno	1928	X	NA	X	NA	X	NA	NA	NA	X	X
46	468-286-04	Baskin's Auto Supply Sign 729 Broadway	Fresno	1953	X	NA	X	NA	NA	X	NA	NA	NA	NA

* Effects assessments for Properties 18-46 provided by the Fresno to Bakersfield Section.
NA = not applicable

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Resources Located within the UPRR/SR 99, BNSF, and Hybrid Alternatives

Key to Historical Status

To differentiate between the types of historic status, descriptions that are indented and bulleted are resources considered historic for the purposes of CEQA; descriptions of historic properties eligible for or listed in the NRHP are not indented or bulleted, but the property name, parcel number, and address are underlined.

Forty-six significant resources are located within the APE for all three of the alternatives. These resources are described from north to south within the APE below. The APE surrounding the Downtown Merced Station includes the following historic properties that appear to meet the criteria for listing in the NRHP.

- PG&E Building (#6) – APN 031-231-005 (560 W 15th Street, Merced). This 1915 building is the former San Joaquin Light and Power Corporation building as shown in Figure 3.17-5. It was previously evaluated (but not concurred with) as meeting the criteria for listing in the NRHP under Criterion C for its architectural merit (as a notable example of Spanish Colonial Revival). The building remains unaltered since the previous evaluation and is still recommended eligible as part of the current study; therefore, formal concurrence with this finding will be sought for the purposes of this undertaking. It is located adjacent to the proposed alignment.

- Merced Southern Pacific Company Passenger Station (#8) – APN 031-360-001 (740 W 16th Street, Merced). This 1926 Neoclassical railroad station was previously evaluated (but not concurred with) as meeting the criteria for listing in the NRHP. The building appears to be significant under Criterion A for its historical association with transportation history in Merced, as well as Criterion C for its architectural merit. The resource remains unaltered since the previous evaluation and is still recommended eligible as part of the current study; therefore, formal concurrence with this finding will be sought for the purposes of this undertaking. The building is located adjacent to the alignment. This resource is shown in Figure 3.17-5.

- KAMB (California Highway Patrol) Building (KMBR) (#9) – APN 034-205-005 (90 E 16th Street, Merced). This 1933 Spanish Colonial Revival building was previously evaluated (but not concurred with) as meeting the criteria to be listed in the NRHP under Criterion C as an earlier example of California Highway Patrol office construction. The building remains unaltered since the previous evaluation and is still recommended eligible as part of the current study; therefore, formal concurrence with this finding will be sought for the purposes of this undertaking. The building lies adjacent to the alignment east of the proposed Merced station as seen in Figure 3.17-6.

The APE surrounding the Downtown Merced Station includes the following historical resources that do not appear to meet the criteria for listing in the NRHP, but are historical resources for the purposes of CEQA.[5]

- Oy Kuong Laundry/Ranch Restaurant (#1) – APN 031-154-011 (245 W 16th Street, Merced). This resource was previously evaluated (through a citywide survey) as representing early 20th century commercial design in Merced. This resource is located adjacent to the proposed alignment, north of the proposed Merced station (Figure 3.17-6).

- 912 W 15th Street (#2) – APN 031-211-007. This resource was previously evaluated (through a citywide survey) as representing an early 20th century Merced residence. This resource is located adjacent to the proposed alignment (Figure 3.17-5).

[5] The California Public Resources Code as it applies to CEQA defines “historical resource” in Section 5020.1 as the following: "Historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic agricultural, educational, social, political, military, or cultural annals of California. It should be noted that a resource that is not listed in, or determined to be eligible for listing in, the California Register of Historic Resources, not included in a local register of historic resources, or not deemed significant in a historical resource survey may nonetheless be historically significant, pursuant to Section 21084.1 of the California Public Resources Code.

Figure 3.17-5
Cultural Resources in the Western Portion of the Downtown Merced Station APE

Figure 3.17-6
Cultural Resources in the Eastern Portion of the Downtown Merced HST Station APE

- 845 W 14th Street (#3) – APN 031-213-015. The Caswell T. Hunter Home was previously evaluated (through a citywide survey) as representing late 19th century residential construction in Merced. This resource is located adjacent to the proposed alignment (Figure 3.17-5).

- 849 W 14th Street (#4) – APN 031-213-016. The Frank Bacigalupi Home was previously evaluated (through a citywide survey) as representing early 20th century residential architecture in Merced. This resource is located adjacent to the proposed alignment (Figure 3.17-5).

- 861 W Q Street (#5) – APN 031-213-017. The Jacob Schafer Home was previously evaluated (through a citywide survey) as representing early 20th century residential construction in Merced. This resource is located adjacent to the proposed alignment (Figure 3.17-5).

- Merced Beverage and Supply Company (#7) – APN 031-243-004 (210 W 15th Street, Merced). This resource was previously evaluated (through a citywide survey) as representing 1930s commercial utilitarian architecture in Merced and is located just south of Merced station (Figure 3.17-6). This resource is located within the footprint of the proposed Merced station.

Proceeding south from the Downtown Merced Station area, the APE includes the De Long Memorial Park, which does not appear eligible for listing in the NRHP, but is a historical resource (Figure 3.17-7) for the purposes of CEQA.

- De Long Memorial Park/Evergreen Memorial Park (#10) – APN 035-160-010 (1480 B Street, Merced). This resource was previously evaluated (through a citywide survey) as representing one of the few examples of Neo-Classical Revival style in Merced. The previous evaluation focused upon the centrally located architectural features of the cemetery which were subjected to substantial additions (noted in the previous evaluation). While the buildings retain integrity, modifications to the surrounding landscape have altered it so that it no longer retains integrity and therefore no longer contributes to the significance of the property. The parcel is still considered a resource for the purposes of CEQA. The northeast corner of the property falls within the footprint of the proposed alignment.

The Ave 24 Wye design option includes the following NRHP-eligible property (Figure 3.17-8):

- 24302 Road 15 (#13) – APN 026-233-011 (24302 Road 15, Chowchilla). This resource is a good example of a late 19th century Italianate style vernacular residence. Characterized by its symmetrical form including a square plan, low-pitched roof, and decorative elements, this is a rare example in the region, significant at the local and regional level. The resource appears to meet Criterion C for listing in the NRHP. This property is located adjacent to proposed roadway improvements.

Both the Ave 24 Wye and Ave 21 Wye design options include the following NRHP-eligible property:

- Robertson Boulevard Tree Row (#14) – This resource extends 11 miles south from Downtown Chowchilla along SR 233 Southwest. The tree row consists of Canary Island palm and ornamental shade trees that Orlando Robertson, founder of Chowchilla, planted in 1912 as part of the development of the Chowchilla town center. The tree row is a California Point of Historical Interest. This resource appears to meet Criterion A for listing in the NRHP. The north and south ends of this resource fall within the footprint of the proposed wyes. This resource is shown in Figure 3.17-8.

South of Madera, the alignment travels toward Fresno, crossing over the San Joaquin River. From Clinton Avenue to the Downtown Fresno Station, the APE includes the following historic properties listed in or eligible for the NRHP:

- Roeding Park (#15) – APN 450-020-08. Roeding Park, as shown in Figure 3.17-9, is a historic recreational facility in the City of Fresno dating to the early 20th century. The resource appears to meet Criterion A for its association with important development patterns in Fresno and Criterion C for its architectural and landscape design merit. The Park was recommended eligible (but not concurred with) as a historic district for the NRHP and the CRHR as a significant example of an early 20th century municipal park. It is also recommended eligible as a district in the Fresno Local Register of

Figure 3.17-7
Cultural Resources in the APE –
South of Merced

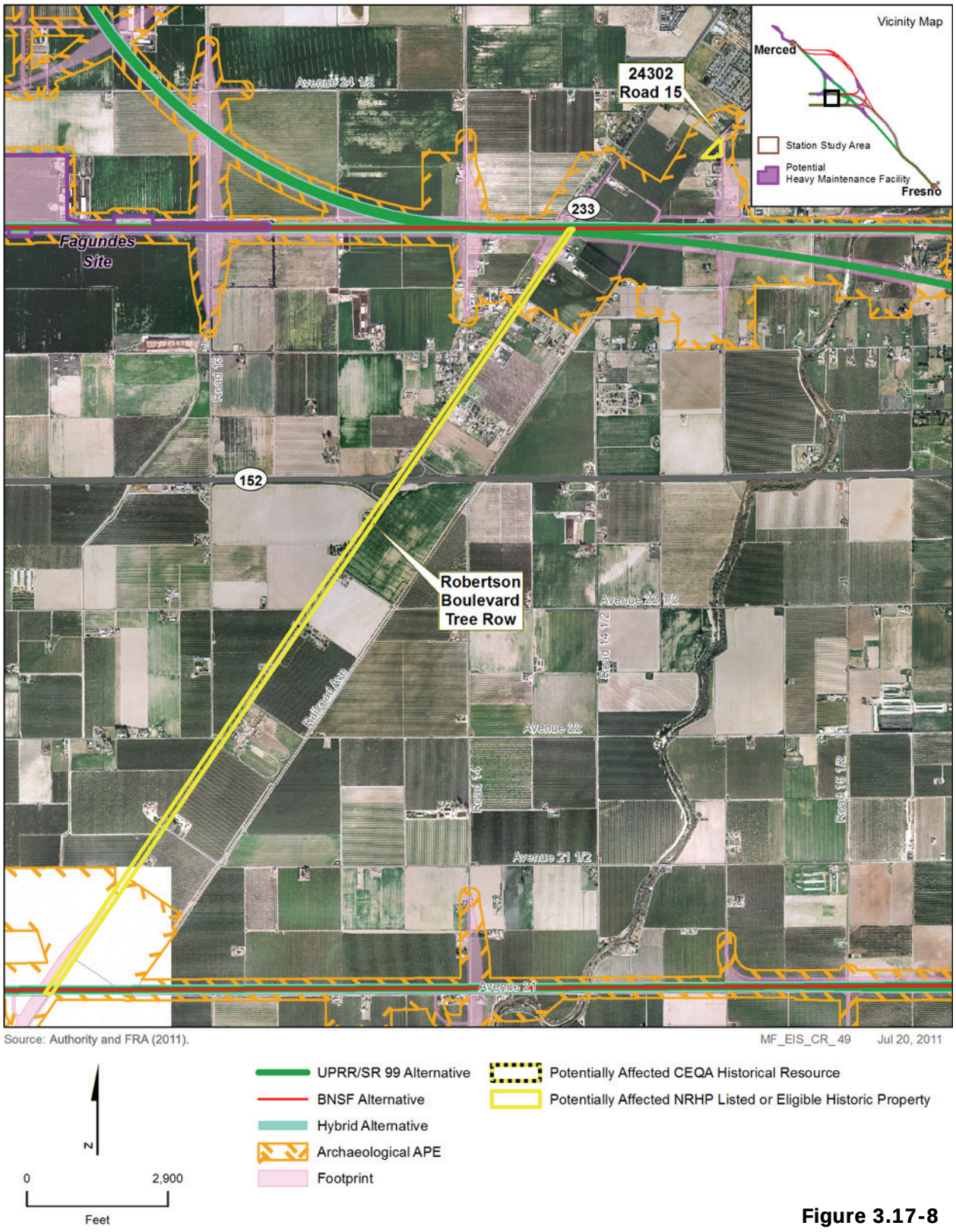

Figure 3.17-8
Cultural Resources in the APE – Chowchilla Vicinity

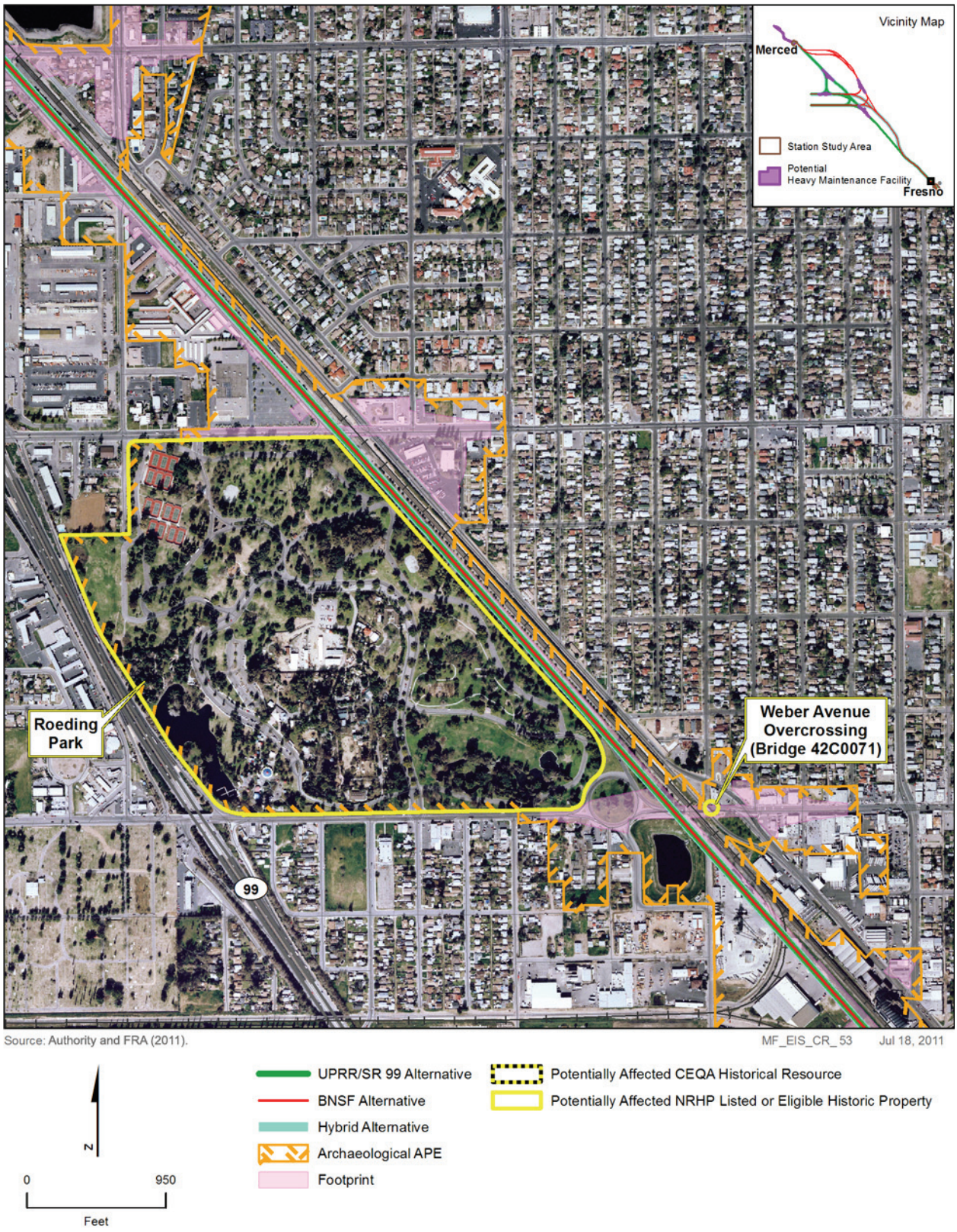

Figure 3.17-9
Cultural Resources in APE – North of Downtown Fresno

Historic Resources for its design and association with George C. Roeding and the Roeding family, who made significant contributions to the development of Fresno in the early 20th century. This resource is located adjacent to the proposed alignment. See Section 3.15, Parks, Recreation, and Open Space, for additional information on Roeding Park. See Chapter 4, Draft Section 4(f)/6(f) Evaluation, for information on Roeding Park as a potential Section 4(f) Section 6(f) resource.

- Weber Avenue Overcrossing (#16) – Bridge 42C0071. Near Roeding Park is the NRHP-eligible Weber Avenue Overcrossing (Figure 3.17-9). The bridge is a 1953 pre-stressed concrete girder road bridge with a span of 66 feet. The bridge was determined eligible for listing on the NRHP through the 2004 Caltrans Bridge Survey (Caltrans 2004). The bridge is the first vehicle bridge in California (and one of the earliest in the United States) to use pre-stressed concrete. This resource falls within the footprint of the proposed alignment.

- Forestiere Underground Gardens (#17) – APN 510-233-03 (5021 W Shaw Avenue). The Forestiere Underground Gardens was listed in the NRHP in 1977 (NPS #77000293) and was designated a California State Landmark (No. 916) in 1978 (Figure 3.17-10). The northeast corner of this property falls within the footprint of proposed roadway improvements associated with the alignment.

As the alternative travels toward the two potential station alternatives in Fresno, the alignment is between one and two blocks away from the following historical resources for the purposes of CEQA. These resources can be seen in Figure 3.17-11:

- Budd & Quinn Showroom/Fresno Body & Fender Works (#18) – APN 466-204-07 (1560 H Street, Fresno). Constructed in 1929, this single-story warehouse was identified in a local survey as eligible for the CRHR and Fresno Local Register as a contributor to a CEQA-only historic warehouse district. Additionally, the building appears individually eligible for the Fresno Local Register.

- Budd & Quinn (#19) – APN 466-204-06 (1514–1518 H Street, Fresno). The Budd & Quinn building is a single-story brick warehouse constructed in 1922. A local survey identified the building as eligible to Fresno Local Register as a contributor to a CEQA-only historic warehouse district.

- H.E. Jaynes & Son (#20) – APN 466-205-14 (1454 H Street, Fresno). This single-story warehouse was constructed in 1944. A local survey identified the building as eligible for the CRHR and Fresno Local Register as a contributor to a CEQA-only historic warehouse district.

- H.E. Jaynes & Son (#21) – APN 466-205-13 (1452 H Street, Fresno). A local survey identified this 1928 warehouse as eligible for the CRHR and Fresno Local Register as a contributor to a CEQA-only historic warehouse district.

- Benham Ice Cream/Dale Bros. Coffee Building; Dale Bros. Coffee Sign (#22) – APN 466-205-11 (1420 H Street, Fresno). This 3-story reinforced concrete industrial building was constructed from 1912 to 1913 and includes a rooftop “Dale Brothers Coffee” coffee can sign. Both the building and the sign are listed in the Fresno Local Register (#248 and #247 respectively) for their association with Fresno’s commercial and economic development and as significant architectural representatives of commercial construction.

- Parker Nash Building (#23) – APN 466-202-19 and 466-202-20 (1460-1462 Broadway, Fresno). This brick building was constructed in two phases: as a single-story warehouse in 1913 and as a 2-story Mediterranean Revival addition in 1934. This property is listed in the Fresno Local Register (Historic Property #226) and may contribute to an as-yet-undocumented CEQA-only automotive historic district, a potential local thematic district.

- 1416 Broadway (#24) – APN 466-202-07. This single-story brick warehouse features a main façade with Spanish Colonial Revival details on its stepped parapet. The building is a possible contributor to the CEQA-only historic warehouse district, which is potentially eligible for inclusion on the CRHR, and potentially eligible for designation as a City of Fresno local historic district.

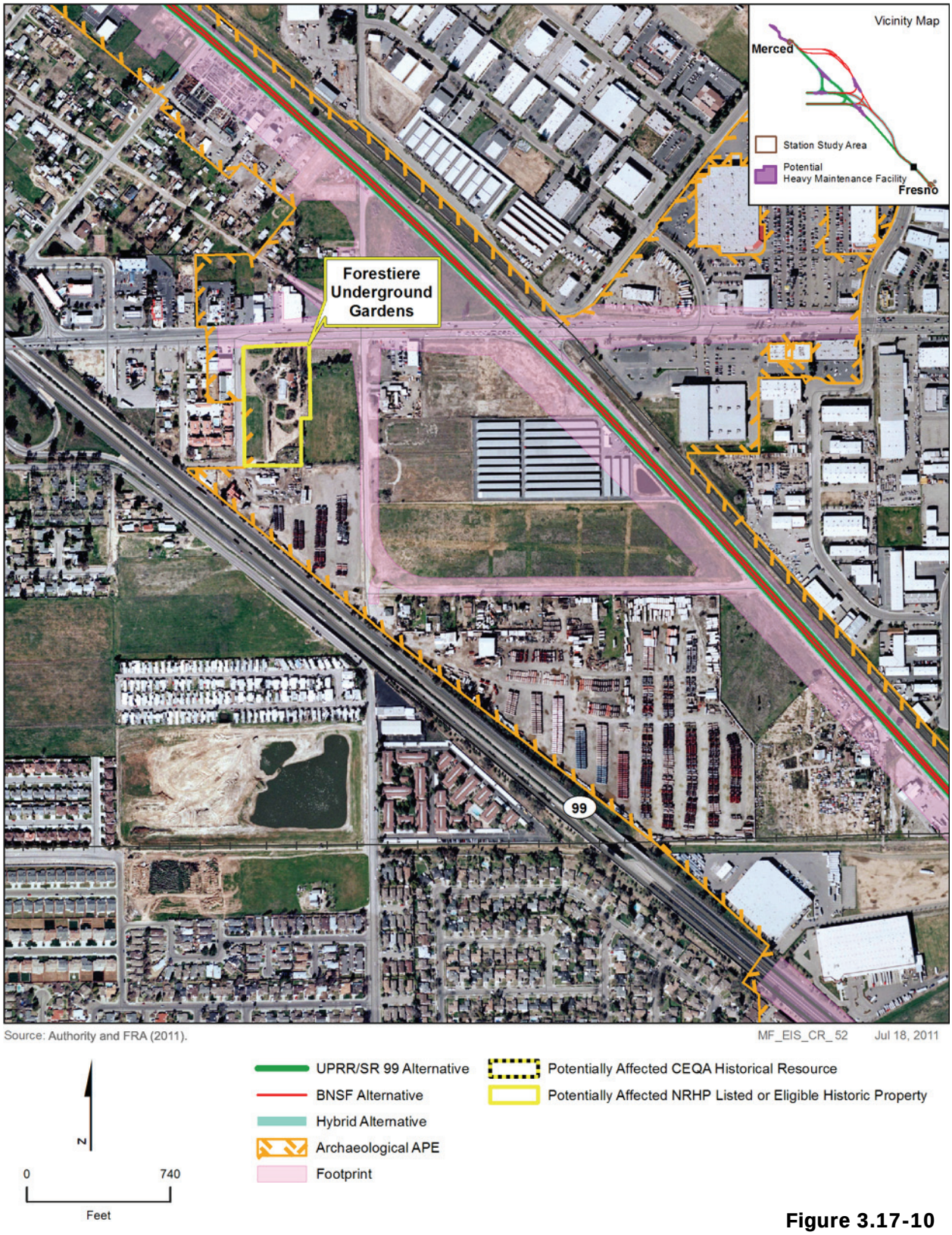

Figure 3.17-10
Cultural Resources in the APE –
North of Fresno

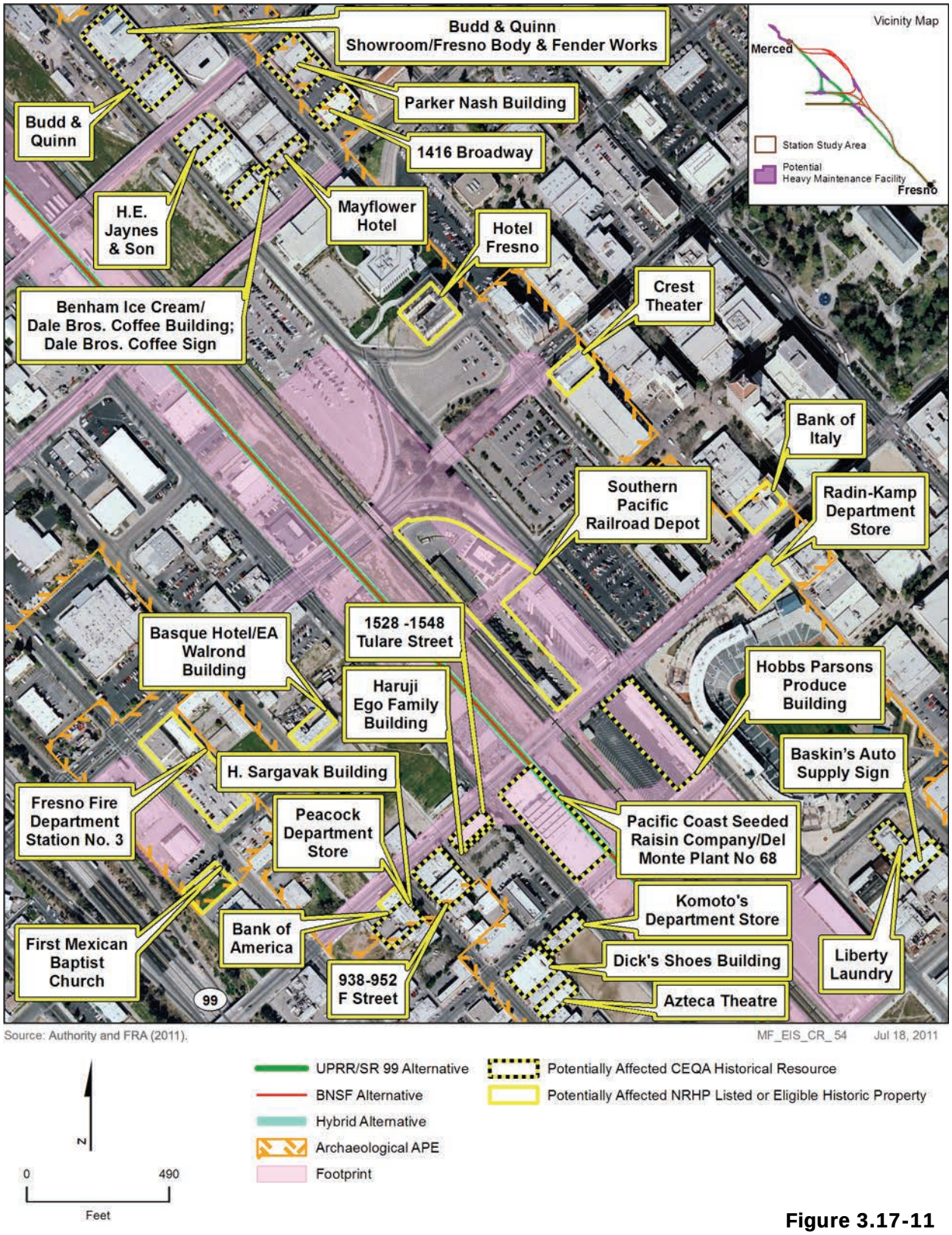

Figure 3.17-11
Cultural Resources along the Downtown Fresno Station Alternatives and Alignment

- Mayflower Hotel (#25) – APN 466-205-05 (1415-1417 Broadway, Fresno). This 3-story brick building has a flat parapet roof and is relatively unadorned. It is an example of streetcar commercial style, with modest period revival influences. This building was identified in a local survey as being individually eligible for the CRHR and Fresno Local Register.

Within the APE surrounding the two potential station alternatives in Downtown Fresno (Mariposa Street Station Alternative and the Kern Street Station Alternative), the APE includes the following structures listed in or eligible for the NRHP. These resources can be seen on Figure 3.17-11 and are described below:

- Hotel Fresno (#26) – APN 466-214-01 (1257 Broadway, Fresno). The Hotel Fresno is a 7-story, steel-frame and concrete-block building constructed in 1912. The building is eligible for listing in the NRHP under Criterion C as the first high-rise building in Fresno and as an early and representative example of the Central Valley work of prominent California architect Edward T. Foulkes. Additionally, the building is listed in the CRHR and the Fresno Local Register of Historic Resources (#166).

- Crest Theater (#27) – APN 466-212-12 (1160 Broadway Plaza, Fresno). The Crest Theater is a tall 2-story, reinforced concrete building constructed in 1948. The building is eligible for listing in the NRHP under Criterion C, at the local level, for its Moderne style and neon marquee (and CRHR Criterion 3). The building was listed in the Fresno Local Register of Historic Resources in February 2011 and is not yet numbered.

- Fresno Fire Department Station (#28) – APN 467-065-08T (1406-1430 Fresno Street, Fresno). This 4-story reinforced concrete building has brick exterior facing and terracotta Beaux Arts details at the frieze and cornice. It appears to be individually eligible for listing in the NRHP and the CRHR (CHRIS status code 3S). The property is eligible under Criteria A and C (and Criteria 1 and 3) as a good local example of a Works Progress Administration project, and for its Streamline Moderne architectural style. The building is listed in the Fresno Local Register of Historic Resources (#213).

- Basque Hotel/E.A. Walrond Building (#29) – 467-062-08 (1102 F Street). The Basque Hotel is a 2-story, L-shaped brick building constructed in 1922. The building is eligible for the NRHR under Criterion A, for its significant role in the Basque community as a place for Basque immigrants to congregate and maintain its cultural tradition. The building also is eligible for the CRHR.

- Southern Pacific Railroad Depot (#30) – 467-030-03 (1033 H Street). Fresno's Southern Pacific Railroad Depot is a 1½-story, brick Queen Anne-style building constructed in 1899. The depot, which includes the Pullman Shed, is listed in the NRHP (NRHP Reference No. 78000665, certified on March 21, 1978). It is significant under Criterion A for its association with the development of Fresno, and Criterion C as an important example of the Queen Anne architectural style. Additionally, the building is listed in the CRHR and the Fresno Local Register (#11).

- Bank of Italy (#31) – APN 468-284-42 (1015 Fulton Mall, Fresno). The Bank of Italy building is an 8-story Italian Renaissance Revival building with an ornate terracotta and brick exterior. This property is listed in the NRHP (NRHP Reference No. 82000963, certified in January 1982) and is therefore also included in the CRHR. The building was listed under Criterion C as "one of the two most significant commercial buildings in the downtown area," and is an example of the Italian Renaissance revival and early skyscraper development. The building is also listed in the Fresno Local Register of Historic Resources (#123).

- First Mexican Baptist Church (#32) – APN 467-103-01 (1061 E Street, Fresno). This 2-story brick building was built between 1924 and 1929, and later reinforced in the 1960s. It has a restrained Mission Revival design that features a stepped parapet and three-story bell tower. It appears to be individually eligible for listing in the NRHP and the CRHR, (CHRIS status code 3S). The property is eligible under Criteria A and C (and Criteria 1 and 3), for its association with the local Mexican American community, and as a good local example of this architectural style. The building is listed in the Fresno Local Register of Historic Resources (#23).

- Radin-Kamp Department Store (#33) – APN 468-281-01 (959 Fulton Mall, Fresno). This 4-story reinforced concrete building has brick exterior facing and terracotta Beaux Arts details at the frieze and cornice. It appears to be individually eligible for listing in the NRHP and the CRHR, (CHRIS status code 3S). The property is eligible under Criterion C and Criterion 3, as a good local example of early twentieth century commercial architecture. The building is listed in the Fresno Local Register of Historic Resources (#124).

- Bank of America (#34) – APN 467-074-01 (947 -951 F Street, Fresno). This 2-story, 2-part commercial building has a stucco exterior and was built in about 1908. It appears to be individually eligible for listing in the NRHP and the CRHR (CHRIS status code 3S). The property is eligible under Criteria A and C (and Criteria 1 and 3), for its association with the local Mexican American community, and as a good local example of this architectural style. The building is listed in the Fresno Local Register of Historic Resources (#64).

The following CEQA historical resources are located within the APE, proximate to the two Fresno station alternatives. These resources can be seen in Figure 3.17-11:

- Peacock Department Store Building (#35) – APN 467-075-02 (937-945 F Street, Fresno). This 2-story brick commercial building has a stucco exterior. It was built in the mid-1920s and has undergone several alterations. Although it is not individually historically significant, and it is not eligible for listing in the NRHP, CRHR, or local register, it is a contributor to a potential local district (CHRIS status code 5D3) and is considered a historical resource for the purposes of CEQA. (The building at 942 Fagan Alley, below, is located on the same legal parcel as the department store).

- H. Sargavak Building (#36) – APN 467-074-02 (942 Fagan Alley, Fresno). This simple single-story brick building was built in 1925. Although it does not appear to meet NRHP significance criteria, it appears to be meet CRHR Criterion C for its architectural type (CHRIS status code 3CS). The building also is eligible for listing in the Fresno Local Register of Historic Resources.

- 938-952 F Street (#37) – APN 467-071-16 (938-952 F Street, Fresno). This circa 1925, 2-story brick commercial building was identified in a local survey as eligible for the Fresno Local Register as a contributing element to a potential CEQA-only Chinatown District.

- 1528 – 1548 Tulare Street (#38) – APN 467-071-01. This 1895, 2-story, brick commercial building was identified in a local survey as individually eligible for listing in the Fresno Local Register for its association with the development of Chinatown and as a contributor to a potential CEQA-only Chinatown District.

- Haruji Ego Family Building (#39) – APN 467-071-02 (956 China Alley, Fresno). The Haruji Ego Family Building is a single-story brick commercial building constructed circa 1900. A local survey identified the building as individually eligible for listing in the Fresno Local Register for its association with the development of Chinatown and as a contributor to a potential CEQA-only Chinatown District. Additionally, the building is a Fresno Heritage Property (#008).

- Pacific Coast Seeded Raisin Company/Del Monte Plant No. 68 (#40) – APN 467-040-12 (1626 Tulare Street, Fresno). This dried-fruit-processing plant was originally constructed circa 1906 and heavily altered and expanded in 1946. A local survey identified the 1946 addition, a 3-story reinforced-concrete processing building constructed in the International style, as eligible for listing in the Fresno Local Register for its architecture.

- Hobbs Parsons Produce Building (#41) – APN 467-040-24 (903-911 H Street, Fresno). The Hobbs Parsons Produce Company building is a single-story masonry building constructed in 1903. The building is listed in the Fresno Local Register (#169) and is a significant architectural representative of warehouse/commercial construction.

- Dick's Shoes Building (Dick Avakian Shoe Repair) (#42) – APN 467-072-08 (1522-1526 Kern Street, Fresno). A local survey identified this 1922, 2-story brick commercial building as eligible for listing in

the CRHR and the Fresno Local Register for its important association with the development of Fresno's Chinatown. The building was also identified as eligible for the local register as a contributor to a potential CEQA-only Chinatown District.

- Azteca Theatre (#43) – APN 467-072-06 (836-840 F Street, Fresno). The Azteca Theatre is an Art Deco-style theatre constructed circa 1950. A local survey identified the building as eligible for listing in the CRHR and Fresno Local Register, for its architecture. The building also appears to be eligible for the local register as a contributor to a potential CEQA-only Chinatown District.

- Komoto's Department Store and Hotel (#44) – APN 467-072-01 (1536-1542 Kern Street, Fresno). This 2-story brick commercial and residential building was constructed circa 1901. A local survey identified the building as individually eligible for listing in the CRHR for its important association with the development of Fresno's Chinatown. The building is listed in the Fresno Local Register (#72) and also is eligible for the Fresno Local Register as a contributor to a potential CEQA-only Chinatown District.

- Liberty Laundry (#45) – APN 468-286-11 (1830 Inyo Street, Fresno). This 1928, brick commercial building is listed in the Fresno Local Register of Historic Resources (#262) as a significant representative of Fresno's economic and social development, for its association with a prominent local family, and as a significant architectural representative of Fresno commercial construction.

- Baskin's Auto Supply Sign (#46) – APN 468-286-04 (729 Broadway, Fresno). The neon Baskin's Auto Supply Sign was erected in 1953 and is listed in the Fresno Local Register (#263) as a heritage sign.

UPRR/SR 99 Alternative

Only two resources are located strictly within the APE of the UPRR/SR 99 Alternative:

- Valley Feed & Fuel Co. (#12) – APN 007-101-020 (121 S Gateway Drive, Madera). This resource consists of an early 20th century grain mill, grain storage and distribution facility, which retains integrity. The property appears to meet Criteria A and C of the NRHP. This resource is located adjacent to the proposed alignment (Figure 3.17-12).

- Madera Southern Pacific Railroad Station (#11) – APN 007-101-016 (120 N E Street). This Neo-Classical Revival railroad depot is an example of an early 20th century railroad station, located in Downtown Madera. It appears to meet the criteria for listing in the NRHP. The building appears to be significant under Criterion A for its historical association with transportation history in Madera, as well as Criterion C for its architectural merit. The building is located directly adjacent to and southwest of the alignment. The resource retains integrity. This resource falls within the footprint of the proposed alignment (Figure 3.17-12).

BNSF Alternative

There are no resources located strictly within the APE of the BNSF Alternative.

Hybrid Alternative

There are no resources located strictly within the APE of the Hybrid Alternative.

3.17.4.4 Paleontological Resources

Paleontological resources are the fossilized remains or traces of animals and plants. They are typically found in sedimentary rock units, and they provide information about the evolution of life on earth over the past billion years or more. Paleontological resources, or fossils, are important scientific and educational resources because they can help document the presence and evolutionary history of particular groups of organisms, reconstruct the environments in which these organisms lived, and provide

Figure 3.17-12
Cultural Resources in the APE –
Downtown Madera

a history of environmental change. Geologists also use fossils to determine the ages of sedimentary units in which they occur, the nature of the geologic events that resulted in the deposition of the sediments, and minerals that might potentially be associated with sedimentary units.

The paleontological sensitivity of a sedimentary unit is determined by its potential to be paleontologically productive (the likelihood that it will yield identifiable megafossils), and its record for producing unique, scientifically important fossils. Well-developed and documented fossil-bearing formations may not yield a unique paleontological resource, but the resources may nevertheless retain scientific importance by fulfilling one or more of the following criteria (SVP 1995):

- Provides information on evolutionary trends or helps to relate living species to extinct species.
- Provides information regarding the development of biological communities and/or past environmental changes.
- Demonstrates unusual circumstances in the history of life.
- Represents a rare taxon or a rare or unique occurrence, or is in short supply and in danger of being destroyed or depleted.
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Provides information that can be used to correlate strata for which it is difficult to obtain other types of age data.

In California, paleontological resources that meet these criteria and, thus, are considered scientifically important include all vertebrate remains as well as most invertebrate and plant fossils. Paleontological sensitivity is, therefore, the qualitative assessment made by a professional paleontologist taking into account the paleontological potential (the likelihood that fossils will be encountered) of the local geology. Table 3.17-7 defines the sensitivity ratings used for the purpose of this assessment.

Table 3.17-7
Paleontological Sensitivity Ratings Employed for This Analysis

Rating	Definition
High	Assigned when geological formations are known to contain paleontological resources that include rare, well-preserved, fossil materials important to ongoing paleoclimatic, paleobiological, or evolutionary studies. These formations have the potential to produce, or have produced, vertebrate remains that are the particular research focus of many paleontologists, and can represent important educational resources.
Moderate	Assigned when stratigraphic units have occasionally but not commonly yielded fossils, have yielded fossils that are common elsewhere, and/or yield fossils that are stratigraphically long-ranging and well represented. This rating can also be applied to strata that have a locally unproven but distinct potential to yield fossil remains based on the stratigraphy or geomorphologic setting.
Low	Assigned when sediment is relatively recent, or represents a high-energy, oxygen-rich depositional environment where fossils are unlikely to be preserved. A low abundance of invertebrate fossil remains, or reworked marine shell from other units can occur, but the paleontological sensitivity would remain low due to their lack of potential to serve significant scientific or educational purposes. This designation also applies to igneous rocks, which may include pockets of sediment that have the potential to preserve fossils, and young deposits, including Holocene deposits and artificial fill, in which fossils, if they exist, are typically out of stratigraphic context.

These sensitivity ratings (shown in Table 3.17-7) follow the guidelines of the SVP (1995) and also incorporate later refinements that allow more exacting effects analyses and mitigation measures. This includes a category reflecting "moderate" paleontological sensitivity. The inclusion of this category avoids the potential of creating false dichotomy between "high" and "low" ratings. It acknowledges that some geological units that have yielded fossil remains do so only infrequently for good geological reasons, and while they are not of "low" sensitivity, neither are they of "high" paleontological sensitivity.

Review of the geological literature and mapping show that five named geologic units important to assessing paleontological resources fall in the project vicinity. From youngest to oldest, they are:

- Modesto Formation, which is Late Pleistocene in age.
- Riverbank Formation, which is late Middle Pleistocene in age.
- Turlock Lake, which is Early to Middle Pleistocene in age.
- Tulare Formation, which is Early to Middle Pleistocene in age.
- Mehrten Formation, which is Late Miocene to Pliocene in age.

The *California HST Project EIR/EIS Merced to Fresno Section Paleontological Resources Technical Report* (Authority and FRA 2011e) discusses these results in more detail. Unless the sites are protected or previously widely publicized (such as the Fairmead Landfill, as discussed below), locations of paleontological sites are kept confidential to minimize unauthorized collecting activities.

Modesto Formation

Fossil records attributed to the Modesto Formation are widely scattered, and could reflect the rare circumstance where a pod of sediment suitable for fossil preservation is encountered, such as that left by a slough or other slack-water deposit. The UCMP Database includes 27 fossils from six localities attributed to the Modesto Formation in the San Joaquin Valley, but these are to the north of the study area in Yolo and Stanislaus counties, and none are located within the study area. These sites have yielded mammal fossils, including ground sloth (*Megalonyx*), mammoth (*Mammuthus*), *Bison*, and the extinct North American camel (*Camelops*), from the Modesto Formation. The *Merced to Fresno Section Paleontological Resources Technical Report* (Authority and FRA 2011e) also notes that some paleontological localities assigned to the Modesto Formation are more likely to be from the Riverbank Formation. The Modesto Formation was therefore assigned moderate paleontological sensitivity based on the fact that it has yielded fossils elsewhere, but not frequently and not in the study area.

Riverbank Formation

Despite the Riverbank Formation's widespread occurrence, the UCMP database includes only eight fossil localities attributed to it, although several of these sites are near the study area. But while there are relatively few localities, they have yielded a large array of extinct mammal fossils including mammoth, camel, ground sloth, the North American horse (*Equus*), cheetah (*Miraecinonyx*), saber-tooth (*Smilodon*), long-neck llama (*Hemiauchenia*), and a diverse assemblage of smaller mammals, reptiles, and amphibians. Despite these diverse assemblages, they occur infrequently; and therefore the Riverbank Formation was assigned moderate paleontological sensitivity.

Turlock Lake and Tulare Formations

The Turlock Lake Formation is not listed in the UCMP database, but a generally age-equivalent formation, the Tulare Formation, is included (Lettis and Unruh 1991). Twelve fossil localities for this formation are included in the UCMP database and occur in this portion of the Great Valley, and one locality is known for the immediate study area.

The Fairmead Landfill fossil site is within 2,000 feet of the UPRR/SR 99 Alternative. This site has yielded a range of large mammal species, including the ground sloths (*Megalonyx, Paramylodon,* and *Nothrotheriops*); mammoth, short-faced bear (*Arctodus*); large cats (*Homotherium, Smilodon*); antelope (*Capromeryx, Tetrameryx*) and camelids (*Camelops, Hemiauchenia*); as well as rodents (*Thomomys, Dipodomys, Spermophilus, Peromyscus,* and *Neotoma*). The Fairmead Landfill fossils were recovered

from the Corcoran Clay Member of the Turlock Lake Formation, approximately 10 to 16 feet below the base of the Riverbank Formation and more than 40 feet below the surface (Dundas et al. 1996). Because of these records, the Turlock Lake and Tulare Formations were assigned high paleontological sensitivity.

Mehrten Formation

The Miocene to Pliocene Mehrten Formation accounts for only a small portion of two alternatives. However, this formation is highly fossiliferous. The UCMP records 37 fossil locations, primarily from Stanislaus County (although several paleontological sites are in Merced County), and these locations have produced microfossils (foraminifera and ostrocods), and fossil mammals including elephantids (*Mammut, Platybelodon, Gomphotherium*), rhinos (*Teleoceras*, *Aphelops*), horses (*Hipparion, Pliohippus, Neohipparion, Nannippus, Pliohippus*), camelids (*Pliauchenia*, *Paracamelus*), primitive rabbits (*Hypolagus, Prosthennops*), and a range of carnivores (*Machairodus, Felis, Borophagus, Pliotaxidea, Osteoborus, Procyon, Pseudaelurus*), amphibians, reptiles, fish, and fossil plants. These sites and this rich fossil record indicate that the Mehrten Formation possesses high paleontological sensitivity.

Other Geological Units

Other geological units without formal designations, and that are generalized and nonspecific, such as "Holocene alluvium," "Undifferentiated Modesto," "Post-Modesto Sediment," "Pleistocene nonmarine sediment," and "Great Valley Sequence", are not searchable using established paleontological data bases. Their paleontological sensitivity is usually low.

Although the extent to which the individual units are affected differ, the geologic units themselves do not change substantially from one HST alternative to another. Table 3.17-8 summarizes, in terms of paleontological sensitivity, the percentage of low, moderate, and high sensitivity sedimentary units found within the HST alternatives by alignment, associated project components, and at the HMF site options.

Table 3.17-8
Relative Paleontological Sensitivity of Geologic Units Potentially Affected by the Merced to Fresno Section HST Alternatives and Components

Alternative or Component	Area with Low Paleontological Sensitivity	Area with Moderate Paleontological Sensitivity	Area with High Paleontological Sensitivity
UPRR/SR 99 Alternative			
UPRR/SR 99 Alternative with West Chowchilla design option and Ave 24 Wye	4%	95%	1%
UPRR/SR 99 Alternative with East Chowchilla design option and Ave 24 Wye	3%	96%	1%
UPRR/SR 99 Alternative with East Chowchilla design option and Ave 21 Wye	4%	96%	1%
BNSF Alternative			
BNSF Alternative with Ave 24 Wye and Mission Ave design option	4%	87%	9%
BNSF Alternative with Ave 24 Wye and Mission Ave East of Le Grand design option	4%	87%	9%

Alternative or Component	Area with Low Paleontological Sensitivity	Area with Moderate Paleontological Sensitivity	Area with High Paleontological Sensitivity
BNSF Alternative with Ave 24 Wye and Mariposa Way design option	7%	84%	9%
BNSF Alternative with Ave 24 Wye and Mariposa Way East of Le Grand design option	6%	85%	9%
BNSF Alternative with Ave 21 Wye and Mission Ave design option	4%	87%	9%
BNSF Alternative with Ave 21 Wye and Mission Ave East of Le Grand design option	4%	87%	9%
BNSF Alternative with Ave 21 Wye and Mariposa Way design option	7%	84%	9%
BNSF Alternative with Ave 21 Wye and Mariposa Way East of Le Grand design option	6%	85%	9%
Hybrid Alternative			
Hybrid Alternative	4%	90%	6%
HST Stations			
Downtown Merced Station	14%	86%	0
Downtown Fresno Station	0	100%	0
Heavy Maintenance Facility Alternatives			
Castle Commerce Center HMF	6%	94%	0
Harris-DeJager HMF	3%	97%	0
Fagundes HMF	0	100%	0
Gordon-Shaw HMF	0	97%	3%
Kojima Development HMF	1%	97%	2%

Source: Authority and FRA (2011a).

3.17.5 Environmental Consequences

3.17.5.1 Overview

As discussed in Chapter 2, Alternatives, under the No Project Alternative, this region will grow considerably in the next 25 years. Cultural resources will continue to be affected in the Central Valley urban areas through the conversion of land use between 2010 and 2035, and through the demolition, degradation, unearthing, and looting of resources. Paleontological resources will also continue to be affected to the extent that excavations encounter paleontologically sensitive sediment.

Construction of the HST System in undeveloped land outside of regional centers would have the greatest potential to affect undisturbed prehistoric archaeological sites because they follow corridors that are less disturbed by development, but a reduced potential to affect either historic archaeological sites or historic structures (which are more directly associated with urbanized area). Due to access restrictions, surveys for archaeological resources are incomplete. However, what is known currently is that the UPRR/SR 99 Alternative may affect 11 archaeological resources, the BNSF Alternative would affect 5 archaeological resources, the Hybrid Alternative may affect 5 archaeological resources, and HMF development may affect 3 archaeological resources. There is one recorded archaeological site opposite the access track to the Castle Commerce Center and potential prehistoric artifacts on the Kojima Development HMF site.

Surveys identified 46 historic architectural resources within the APE: 19 historic properties under Section 106 and 27 historical resources under CEQA. The UPRR/SR 99, BNSF, and Hybrid alternatives would cause an adverse effect on six of the Section 106 historic properties, and would cause substantial adverse change to five of the CEQA historical resources (where they share a common alignment). The UPRR/SR 99 Alternative would cause an adverse effect on two additional Section 106 properties that are located exclusively in that alignment, for a total of eight that would be affected by the UPRR/SR 99 Alternative. The Downtown Merced Station would cause a substantial adverse change to one CEQA historical resource. The Mariposa Street Station Alternative in Fresno would not cause adverse effects on Section 106 historic properties (a minor effect under NEPA), and would cause substantial adverse changes to one CEQA historical resource through demolition. The Kern Street Station Alternative in Fresno would not cause adverse effects on Section 106 historic properties (a minor effect under NEPA), and would cause substantial adverse changes to two CEQA historical resources through demolition.

3.17.5.2 No Project Alternative

Cultural resources will continue to be affected in the Central Valley urban areas through the conversion of land use between 2010 and 2035 due to growth, and changes in land use and ground disturbance associated with other transportation infrastructure improvements that would be needed without the project, including the expansion of existing highways to accommodate the state's growing population. Adverse effects on eligible resources could result in the neglect, abandonment, or removal of historic properties. If growth remains, as planned in the urban growth boundaries, the areas of the APE that pass through primarily rural agricultural lands are not likely to change substantially in terms of land use. However, much of the development plans in Madera are outside these boundaries and adjacent to the San Joaquin River, in the southeast portions of Madera County. The areas of the APE that pass through rural communities such as Le Grand, Chowchilla, and developed unincorporated areas of Merced, Madera, and Fresno counties are likely to experience land use changes as a result of economic challenges and private redevelopment during the analysis period. The areas of the APE that pass through the larger urban municipalities including Merced, Madera, and Fresno are likely to experience these types of land use changes as a result of municipal redevelopment, private redevelopment, and economic challenges. These changes will likely result in further unearthing of sensitive archaeological resources; disturbance of TCPs; disturbance and possible damage to paleontological resources; and removal of, or changes to, the historic character and settings of historic architectural resources. A number of these projects are likely to undergo CEQA review.

3.17.5.3 Impacts

Archaeological Resources

Archaeological sites will only be subject to adverse effects during construction activities. Increasing public access to archaeological sites can lead to their intentional or unintentional disturbance or destruction by people who previously would not have been able to enter the property where the site is located. The HST alternatives are not creating new access for any areas that contain archaeological resources. In remote areas, the guideway would be fenced; therefore, it would not provide access for persons to loot sites and would not expose sites to the adverse effects of compaction through pedestrian or vehicular traffic. Because the HST System would not allow anyone but maintenance persons or vehicles within the operating corridor, it is unlikely that operation of the HST would affect archaeological sites. The related

roadway modifications would not cause more traffic near identified archaeological sites. There is a possibility for new sites to be discovered during construction, but these would be managed under supervision of a trained archaeologist to record sites and treat artifacts according to the PA and associated MOA and treatment plan. Therefore, project operation would not result in effects on archaeological resources. The impact is considered neglible under NEPA and less than significant under CEQA.

Potential Adverse Effects on Archaeological Resources Caused by Construction Activities

Soil excavation or compaction resulting from the use of heavy machinery on the construction site itself or in staging areas may affect the integrity of artifact-bearing deposits associated with known and as-yet undiscovered archaeological sites. Common to all alternatives, unknown or unrecorded archaeological resources, including subsurface buried archaeological deposits, may exist, but are currently unknown. Construction areas related to ground disturbance could contain unknown historical resources or properties. Disturbance and removal of archaeological resources could result in adverse effects on archaeological resources under Section 106 and could cause substantial adverse changes in the significance of an archaeological resource pursuant to Section 15064.5 and is therefore considered a substantial effect under NEPA and a significant impact under CEQA.

UPRR/SR 99 Alternative

The UPRR/SR 99 Alternative has the potential to affect 11 either known archaeological sites or archaeologically sensitive areas. These 11 resources include 5 archaeological sites (P-24-001862, P-24-001676/CA-MER-381/H, P-24-001686/CA-MER-383, P-20-002064/CA-MAD-2064H, P-20-002122/CA-MAD-2121H) that have been previously documented in the UPRR/SR 99 Alternative APE, all of which are either eligible or potentially eligible for NRHP listing and may be affected by ground-disturbing activities during construction of the north-south alignment. In addition, two archaeological sites and four archaeologically sensitive areas that may be eligible for NRHP listing were documented within the UPRR/SR 99 Alternative during this survey. These include archaeological sites HST-H-JL-01 and HST-H/P-TC-01. The four archaeologically sensitive areas are two potential ethnographic villages, one potential burial ground, and the Rotary Park area.

In addition, the UPRR/SR 99 Alternative makes multiple stream or river crossings, which are assessed to be sensitive to undocumented prehistoric archaeological resources not already identified. All of these resources or potential resources are subject to construction period impacts, which would be considered an adverse effect under Section 106; a substantial effect under NEPA; and a significant impact under CEQA.

BNSF Alternative

The BNSF Alternative has the potential to affect five archaeological resources. These include one previously documented, potentially eligible prehistoric site (P-24-001862), a newly reported archaeological site (HST-H-JL-02), two potential ethnographic villages, and one potential burial ground (all considered archaeologically sensitive). Numerous named and unnamed stream or river crossings are sensitive to undocumented archaeological sites along this alternative and may be affected by construction activities. All of these resources or potential resources are subject to construction period impacts, which would be considered an adverse effect under Section 106; a substantial effect under NEPA; and a significant impact under CEQA.

Hybrid Alternative

The Hybrid Alternative has the potential to affect five archaeological resources. These include one NRHP-eligible prehistoric site (CA-MER-381), one historic and prehistoric site (CA-MER-383), two potential ethnographic villages, and one potential burial ground (considered archaeologically sensitive). The Hybrid Alternative crosses named and unnamed streams and rivers that are assessed to be sensitive to undocumented prehistoric archaeological resources and may be affected by construction activities. All of these resources or potential resources are subject to construction period impacts, which would be

considered an adverse effect under Section 106; and a substantial effect under NEPA; and a significant impact under CEQA.

Heavy Maintenance Facility Alternatives

One previously documented prehistoric archaeological site (P-24-001862) has been previously recorded as partially within the APE for the Castle Commerce Center HMF, as is the newly reported HST-H/P-TC-01 site. Prehistoric artifacts have been reported within the Kojima Development HMF site, and it is considered sensitive to archaeological deposits. All three of these resources may be subject to construction period impacts. There would be no construction period impacts on documented cultural resources for the proposed Harris-DeJager, Fagundes, or Gordon-Shaw HMF sites. Two of the HMF sites, Castle Commerce Center and Kojima Development, would cause construction period impacts considered an adverse effect under Section 106; a substantial effect under NEPA; and a significant impact under CEQA.

Historic Architectural Resources

Potential Adverse Effects on Historic Architectural Resources Due to Construction Activities

The activities that cause impacts on cultural resources are typically associated with the construction of the project: disturbance of the ground, the material or physical alteration of the built environment, or the alteration of the visual setting. Construction activities may cause impacts on cultural resources and can include excavation, staging, heavy equipment usage and movement, drilling, demolition, or relocation, as well as increases in noise or vibration levels, or introduction of new visual elements. The MOA for the Merced to Fresno Section will establish measures that will be implemented before, during, and after construction to treat adverse effects. The effects and changes to historic architectural resources are described in the section below, by alternative, and a summary of these findings is provided in Table 3.17-9.

One common potential adverse effect or change is construction noise and vibration; therefore, the project will develop avoidance mitigation to ensure that there would be no indirect adverse effects or indirect substantial adverse change to any historic properties (Section 106) or historical resources (CEQA) from noise or vibration caused by construction activities for any of the Merced to Fresno Section alternatives. Vibration from impact pile-driving during construction could cause the physical destruction, damage, or alteration of historic properties or historical resources if the pile-driving is within 80 to 140 feet of the building. Because this impact pile-driving could cause adverse effects or substantial adverse changes, alternative construction methods causing less than 0.12 peak particle velocity of 1 inch per second (0.12 PPV in/sec) measured at the receptor would be developed for construction activities near historic properties or historical resources if they are determined to be extremely susceptible to vibration damage. The development of alternative construction methods at these locations would avoid adverse effects on historic properties (Section 106) and would avoid substantial adverse changes to historical resources (CEQA). Preconstruction surveys conducted at locations within 50 feet of piling will document existing condition of buildings in case there is an issue during or after construction.

Construction noise also has the potential to cause adverse effects or substantial adverse change to historic properties and historical resources. Historic properties and historical resources that are sensitive to noise include resources like residences, parks, libraries, museums, and schools. These types of resources have an inherent quiet nature that is part of their identification as well as their significance. As a precaution, the project would develop avoidance mitigation to avoid adverse effect or substantial adverse change resulting from such construction noises such as impact pile-driving, jackhammering, and truck loading and operations. Avoidance mitigations would include alternative measures, such as low-noise emission equipment and noise-deadening for trucks.

UPRR/SR 99, BNSF, and Hybrid Alternatives

Eleven built environment resources would be directly or indirectly adversely affected or experience substantial adverse change from construction activities associated with the UPRR/SR 99, BNSF, and

Hybrid alternatives or their connectors (wyes), as shown in Table 3.17-9. The effects of the design options are discussed in more detail below.

The UPRR/SR 99, BNSF, and Hybrid alternatives would cause *direct adverse effects* under Section 106 on the following three historic properties:

- Robertson Blvd. Tree Row (#14) is in the direct path of both the Ave 24 and Ave 21 wyes for all three alternatives and construction would result in the physical demolition, destruction, damage, or substantial alteration of this linear resource between the two wyes. As a result, the proposed project would cause direct adverse effects under Section 106, direct substantial adverse change under CEQA, and substantial impacts under NEPA.

- Weber Avenue Overcrossing (#16) is in the direct path of these alternatives, which share a common alignment in this location. Construction would result in the physical demolition, destruction, damage, or substantial alteration of the resource. As a result, the proposed project would cause direct adverse effects under Section 106, direct substantial adverse change under CEQA, and substantial impacts under NEPA.

- Forestiere Underground Gardens: APN 510-233-03 (#17) is in the direct path of roadway improvements associated with all three alternatives, which share a common alignment in this location. Construction would result in the physical demolition, destruction, damage, or substantial alteration of the northeast corner of the property, which would be intersected by roadway improvements. As a result, the proposed project would cause direct adverse effects under Section 106, direct substantial adverse change under CEQA, and substantial impacts under NEPA.

The UPRR/SR 99, BNSF, and Hybrid alternatives all would cause an *indirect adverse effect* under Section 106 on the following three historic properties:

- Roeding Park: APN 450-020-08 (#15) is immediately adjacent to these alternatives, which share a common alignment in this location. Construction would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect adverse effect under Section 106, a moderate effect under NEPA, and a less than significant impact under CEQA. Mitigation options are addressed in further detail in Section 3.15, Parks, Recreation, and Open Space.

- Southern Pacific Railroad Depot: APN 467-030-31 (#30) is located immediately adjacent to these alternatives, which share a common alignment in this location. The project in this location includes construction of a Tulare Street overcrossing that would be adjacent to the southern side of the resource. Construction would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect adverse effect under Section 106, a moderate impact under NEPA, and a less than significant impact under CEQA. The project in this location also includes an option for an undercrossing at Tulare Street and this option would have no adverse effect on this property.

- Bank of America: APN 467-074-01 (#34) is located adjacent to the Tulare Street overcrossing, which includes roadway changes associated with the project. The construction of roadway overpasses within 15 feet of the resource would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect adverse effect under Section 106, an indirect substantial adverse change under CEQA, and a moderate impact under NEPA. The project in this location also includes an option for an undercrossing at Tulare Street and this option would have no adverse effect on this property.

Table 3.17-9
Effects on Historic Architectural Resources by Component of the HST Project

Map ID	APN	Name/Address	County	UPRR/ SR 99 Alternative[a]		BNSF Alternative[a]		Hybrid Alternative[a]			UPRR/SR 99, BNSF, Hybrid Alternatives		
				North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
1	031-154-011	Oy Kuong Laundry/Ranch Restaurant 245 W 16th Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	No Substantial Adverse Change	NA	NA
2	031-211-007	912 W 15th Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	No Substantial Adverse Change	NA	NA
3	031-213-015	Caswell T. Hunter Home 845 W 14th Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	No Substantial Adverse Change	NA	NA
4	031-213-016	Frank Bacigalupi Home 849 W 14th Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	No Substantial Adverse Change	NA	NA
5	031-213-017	Jacob Schafer Home 861 W Q St	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	No Substantial Adverse Change	NA	NA
6	031-231-005	PG&E Building 560 West 15th Street	Merced	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	No Adverse Effect	NA	
7	031-243-004	Merced Beverage and Supply Company 210 W 15th Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	Substantial Adverse Change - Direct	NA	NA
8	031-360-001	Merced Southern Pacific Company Passenger Station 740 W 16th Street	Merced	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	No Adverse Effect	NA	NA
9	034-205-005	KAMB (California Highway Patrol) Building 90 E 16th Street	Merced	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	No Adverse Effect	NA	NA
10	035-160-010	De Long Memorial Park/Evergreen Memorial Park 1480 B Street	Merced	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
11	007-101-016	Madera Southern Pacific Railroad Station 120 N E Street	Madera	Adverse Effect - Direct	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	007-101-020	Valley Feed & Fuel Co. 121 Gateway Drive	Madera	Adverse Effect - Indirect	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	026-233-011	24302 Road 15	Madera	NA	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	NA
14	No APN	Robertson Blvd. Tree Row (SR 233)	Madera	NA	Adverse Effect - Direct	NA	Adverse Effect - Direct	NA	Adverse Effect - Direct	Adverse Effect - Direct	NA	NA	NA

Map ID	APN	Name/Address	County	UPRR/ SR 99 Alternative[a]		BNSF Alternative[a]		Hybrid Alternative[a]			UPRR/SR 99, BNSF, Hybrid Alternatives		
				North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
15	450-020-08	Roeding Park	Fresno	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	NA	NA	NA	NA
16	No APN	Weber Avenue Bridge 42C0071 (no address)	Fresno	Adverse Effect - Direct	NA	Adverse Effect - Direct	NA	Adverse Effect - Direct	NA	NA	NA	NA	NA
17	510-233-03	Forestiere Underground Gardens 5021 W Shaw Avenue	Fresno	Adverse Effect - Direct	NA	Adverse Effect - Direct	NA	Adverse Effect - Direct	NA	NA	NA	NA	NA
18*	466-204-07	Budd & Quinn Showroom/Fresno Body & Fender Works 1560 H Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
19	466-204-06	Budd & Quinn 1514 – 1518 H Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
20	466-205-14	H.E. Jaynes & Son 1454 H Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
21	466-205-13	H.E. Jaynes & Son 1452 H Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
22	466-205-11	Benham Ice Cream/Dale Bros. Coffee Building; Dale Bros. Coffee Sign 1420 H Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
23	466-202-19 466-202-20	Parker Nash Building 1460-1462 Broadway	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
24	466-20-207	1416 Broadway	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
25	466-205-05	Mayflower Hotel 1415-1417 Broadway	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
26	466-214-01	Hotel Fresno 1257 Broadway	Fresno	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	No Adverse Effect	No Adverse Effect
27	466-212-12	Crest Theater 1160 Broadway Plaza	Fresno	NA	NA	NA	NA	NA	NA		NA	No Adverse Effect	NA
28	467-065-08	Fresno Fire Department Station No. 3 1406-1430 Fresno Street	Fresno	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	–No Adverse Effect	–No Adverse Effect
29	467-062-08	Basque Hotel/EA Walrond Building 1102 F Street	Fresno	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	No Adverse Effect	NA

Map ID	APN	Name/Address	County	UPRR/ SR 99 Alternative[a]		BNSF Alternative[a]		Hybrid Alternative[a]			UPRR/SR 99, BNSF, Hybrid Alternatives		
				North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
30	467-030-31	Southern Pacific Railroad Depot 1033 H Street	Fresno	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	NA	NA	No Adverse Effect	No Adverse Effect
31	466-213-07	Bank of Italy 1015 Fulton Mall	Fresno	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	NA	NA
32	467-103-01	First Mexican Baptist Church 1061 E Street	Fresno	NA	NA	NA	NA	NA	NA	NA	NA	–No Adverse Effect	–No Adverse Effect
33	468-284-41	Radin-Kamp Department Store 959 Fulton Mall	Fresno	No Adverse Effect	NA	No Adverse Effect	NA	No Adverse Effect	NA	NA	NA	NA	NA
34	467-074-01	Bank of America 947-951 F Street	Fresno	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	Adverse Effect - Indirect	NA	NA	NA	NA	NA
35	467-074-02 East Side	Peacock Department Store 937-945 F Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
36	467-074-02 West Side	H. Sargavak Building 942 Fagan Alley	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA
37	467-071-16	938-952 F Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
38	467-071-01	1528-1548 Tulare Street	Fresno	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
39	467-071-02	Haruji Ego Family Building 956 China Alley	Fresno	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
40	467-040-12	Pacific Coast Seeded Raisin Company/Del Monte Plant No 68 1626 Tulare Street	Fresno	Substantial Adverse Change - Direct	NA	Substantial Adverse Change - Direct	NA	Substantial Adverse Change - Direct	NA	NA	NA	Substantial Adverse Change – Direct	Substantial Adverse Change – Direct
41	467-040-24	Hobbs Parsons Produce Building 903 – 911 H Street	Fresno	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	NA	NA	No Substantial Adverse Change	Substantial Adverse Change - Direct
42	467-072-08	Dick's Shoes Building 1522-1526 Kern Street (in CEQA HD)	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
43	467-072-06	Azteca Theatre 836-840 F Street (in CEQA only Chinatown District, not eligible for NR)	Fresno	NA	NA	NA	NA	NA	NA	NA	NA	NA	No Substantial Adverse Change

Map ID	APN	Name/Address	County	UPRR/ SR 99 Alternative[a]		BNSF Alternative[a]		Hybrid Alternative[a]			UPRR/SR 99, BNSF, Hybrid Alternatives		
				North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 and 21 Wye	North-South Alignment	Ave 24 Wye	Ave 21 Wye	Merced Station	Fresno Station – Mariposa Street Alternative	Fresno Station – Kern Street Alternative
44	467-072-01	Komoto's Department Store 1536-1542 Kern Street	Fresno	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	Substantial Adverse Change - Indirect	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
45	468-286-11	Liberty Laundry 1830 Inyo Street	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	No Substantial Adverse Change	No Substantial Adverse Change
46	468-286-04	Baskin's Auto Supply Sign 729 Broadway	Fresno	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	No Substantial Adverse Change	NA	NA	NA	NA	NA

[a] Each of the three alternatives join south of the San Joaquin River and continue into Downtown Fresno primarily at grade. Effects assessed for each of those options apply to all three main alternatives.

* Effects assessments for Properties 18-46 provided by the Fresno to Bakersfield team.

NA = not applicable

The UPRR/SR 99, BNSF, and Hybrid alternatives all would cause a *direct* substantial adverse change to one historical resource (CEQA). Proposed construction activities under these alternatives would intersect with:

- Pacific Coast Seeded Raisin Company/Del Monte Plant No. 68: APN 467-040-12 (#40) would be crossed by the alternatives, which are on a common route in this location, resulting in the physical demolition, destruction, damage, or substantial alteration to the resource. As a result, the proposed project would cause direct substantial adverse change under CEQA, and substantial impacts under NEPA.

The UPRR/SR 99, BNSF, and Hybrid alternatives all would cause an *indirect* substantial adverse change to four historical resources (CEQA):

- No. 1528-1548 Tulare Street: APN 467-071-01 (#38) is located immediately adjacent to these alternatives, which share a common alignment in this location. The building is also located adjacent to proposed roadway improvements at Tulare Street. The overcrossing structure would pass directly in front of the building, blocking views of and from the main and secondary facades. Construction of the alignment and the overpass would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect substantial adverse change under CEQA, and moderate impacts under NEPA. The project in this location also includes an option for an undercrossing at Tulare Street and this option would have no adverse effect on this property.

- Haruji Ego Family Building: APN 467-071-02 (#39) is located immediately adjacent to these alternatives, which share a common alignment in this location. Construction includes an at-grade rail line and a temporary precast concrete yard near the resource. Construction would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect substantial adverse change under CEQA, and moderate impacts under NEPA.

- Hobbs Parsons Produce Building: APN 467-040-24 (#41) is located immediately adjacent to these alternatives, which share a common alignment in this location. The building is also located adjacent to proposed roadway improvements at Tulare Street. The overcrossing would be constructed within approximately 22 feet of the main façade of the resource, blocking views of and from the main and secondary facades. Construction of the alignment and the overpass would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect substantial adverse change under CEQA, and moderate impacts under NEPA. The project in this location also includes an option for an undercrossing at Tulare Street and this option would have no adverse effect on this property.

- Komoto's Department Store and Hotel: APN 467-072-01 (#44) is located immediately adjacent to these alternatives, which share a common alignment in this location. Construction includes an at-grade rail line and temporary precast concrete yard near the resource. Construction would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause an indirect substantial adverse change under CEQA, and moderate impacts under NEPA.

UPRR/SR 99 Alternative

Only the UPRR/SR 99 Alternative would cause a *direct adverse effect* (Section 106) on the following resources:

- The Madera Southern Pacific Railroad Station: APN 007-101-016 (#11) is in the direct path of this alternative, and its construction would result in the physical demolition, destruction, damage, or substantial alteration of the resource. As a result, the proposed project would cause direct adverse effects under Section 106, direct substantial adverse change under CEQA, and substantial impacts under NEPA.

Only the UPRR/SR 99 Alternative would cause an *indirect adverse effect* (Section 106) on the following resource:

- Valley Feed & Fuel Co.: APN 007-101-020 (#12) is located immediately adjacent to this alternative, which is elevated through Downtown Madera. Construction of an elevated alignment where structures of this scale do not currently exist would introduce new visual elements that would diminish the integrity of the significant features of this property. As a result, the proposed project would cause indirect adverse effects under Section 106, an indirect substantial adverse change under CEQA, and moderate impacts under NEPA.

High-Speed Train Stations

Downtown Merced Station

The Downtown Merced Station would cause *direct* substantial adverse change to one (1) historical resource (CEQA):

- Merced Beverage and Supply Company: APN 031-243-004 (#7) is in the direct path of this alternative, and its construction would result in the physical demolition, destruction, damage, or substantial alteration of the resource. As a result, the proposed project would create a direct substantial adverse change under CEQA and substantial impacts under NEPA.

Downtown Fresno Station - Mariposa Street Station Alternative

The Mariposa Street Station Alternative would not have any *direct or indirect* adverse effects on any historic properties (Section 106).

The Mariposa Street Station Alternative would cause a *direct* substantial adverse change to the following CEQA historical resource:

- Pacific Coast Seeded Raisin Company/Del Monte Plant No. 68: APN 467-040-12 (#40) is located within the proposed footprint of the Mariposa Street Station and construction would result in the physical destruction, damage, or alteration of the resource. As a result, the proposed project would cause direct substantial adverse change under CEQA, and substantial impacts under NEPA.

Downtown Fresno Station - Kern Street Station Alternative

The Kern Street Station Alternative would not have any *direct or indirect* adverse effects on any historic properties (Section 106).

The Kern Street Station Alternative would cause a *direct* substantial adverse change to the following two historical resources (CEQA):

- Pacific Coast Seeded Raisin Company/Del Monte Plant No. 68: APN 467-040-12 (#40) is located within the proposed footprint of the Kern Street Station and construction would result in the physical destruction, damage, or alteration of the resource. As a result, the proposed project would cause direct substantial adverse change under CEQA, and substantial impacts under NEPA.

- Hobbs Parsons Produce Building: APN 467-040-024 (#41) is located within the proposed footprint of the Kern Street Station and construction would result in the physical destruction, damage, or alteration of the resource. As a result, the proposed project would cause direct substantial adverse change under CEQA, and substantial impacts under NEPA.

Heavy Maintenance Facility Alternatives

There would be no anticipated construction-period impacts on documented historic architectural resources under any of the HMF alternatives.

Paleontological Resources

The paleontological sensitivity of the sediments that may be encountered within the study area during construction was discussed in Section 3.17.5.3, Construction Period Impacts. Excavations in sediments with low paleontological sensitivity are not expected to significantly affect paleontological resources. Disturbance of sediments with moderate to high paleontological sensitivity would have impacts that are significant under CEQA, but below significant with mitigation. Comparisons of the extent to which the different alternatives and other design elements affect sediments of low, moderate, and high paleontological sensitivity are presented in Table 3.17-8.

Common Adverse Effects on Paleontological Resources Due to Construction

Like archaeological resources, construction activities that may impact paleontological resources include excavation, heavy equipment usage and movement at depth, and drilling. Surficial activities such as staging and clearing usually do not affect paleontological resources because the associated disturbance does not extend deep enough to impact paleontologically sensitive sediment.

Table 3.17-8 shows the percentage of area underlain by sediments of low, moderate, and high paleontological sensitivity for each alternative, while the *Merced to Fresno Section Paleontological Resources Technical Report* (Authority and FRA 2011e) provides a detailed description of the analysis performed for each alternative. As can be seen, all three build alternatives have about the same proportion of their right-of-way occupied by sediment of moderate paleontological sensitivity, from about 84% to 96% of the right-of-way. This is due to the preponderance of middle to late Pleistocene age sediment near the surface; the Modesto and Riverbank Formations primarily. These alluvial deposits have yielded extinct Pleistocene vertebrates including ground sloths, mammoth, the extinct North American camel, and other large mammals that speak to a bygone ecosystem of ancient California. However, in the aggregate fossil sites yielding these remains are not common, so these near-surface alluvial deposits are assigned moderate and not high paleontological sensitivity. Potential effects on unique paleontological resources would be substantial under NEPA and significant under CEQA.

For discriminating among different alternatives' impacts on paleontological resources, contrasts may be found in the relative effects on sediment with high paleontological sensitivity. The proportion of area with low paleontological sensitivity is also important, particularly for more areally limited features, such as the HMFs and the stations (Table 3.17-8).

UPRR/SR 99 Alternative

The UPRR/SR 99 Alternative crosses geologic units ranging from low to high paleontological sensitivity. The majority of the alignment is underlain by the moderately sensitive Modesto and Riverbank Formations, but only a small portion (approximately 1%) is underlain by the highly sensitive Turlock Lake Formation. The remainder of the alignment (3% to 4%) crosses geological units with low paleontological sensitivity. In terms of the absolute (not relative) area of high paleontological sensitivity affected, this alternative would have the least effect, with less than 15 acres of high-sensitivity sediment crossed by the paleontological APE.

There would be negligible difference in the relative impacts on high and moderate sensitivity sediments among the West and East Chowchilla design options and, as noted for all alternatives, the Ave 24 Wye and the Ave 21 Wye also are predominantly underlain by the sediments with moderate paleontological sensitivity. A small portion of the Ave 21 Wye crosses the Turlock Lake Formation. Although the Turlock Lake Formation underlies less than 1% of the different rights-of-way of the design options, it has produced a diverse vertebrate fossil assemblage from the Fairmead Landfill nearby, and therefore impacts on paleontological resources could be substantive despite to apparently low value of 1% of the right-of-way.

If the West of Chowchilla design option were to be implemented, the number of acres of sediments of moderate paleontological sensitivity crossed by the project route would change slightly; however, the

change would not substantially alter the paleontological impacts of the UPRR/SR 99 Alternative options. The acres of sediment of high and low paleontological sensitivity crossed by the project would not change.

BNSF Alternative

The BNSF Alternative is divided into eight design option combinations for the sake of assessing impacts on paleontological resources (Table 3.17-8). From 84% to 87% of each crosses the moderate sensitivity Modesto and Riverbank Formations. A greater proportion of sediment with high paleontological sensitivity would be affected by the design options of the BNSF Alternative (9%) than would be the case for the UPRR/SR 99 and Hybrid alternatives (Table 3.17-8). The total acreage of high-sensitivity sediment crossed ranges from 170 to 190 acres depending on design option (Authority and FRA 2011e).

Paleontological impacts resulting from implementation of any BNSF Alternative design option would be higher than under the UPRR/SR 99 Alternative to the extent that the BNSF Alternative design options cross a larger proportion of sediment with high paleontological sensitivity (9% versus 1%; Table 3.17-8), or 170 to 190 acres for the BNSF Alternative versus only 14 acres for any of the UPRR/SR 99 Alternative design options.

Hybrid Alternative

Because the Hybrid Alternative is a blend of the UPRR/SR 99 and the BNSF Alternatives, it crosses the same geological units in about the same places, and therefore the effects on paleontological resources of this third alternative do not differ substantively from the other two alternatives. Sediment of moderate paleontological sensitivity underlies most of the paleontological APE, at just under 90% of the total right-of-way for the Hybrid route (Table 3.17-8). However, the area of high paleontological sensitivity sediment crossed by the Hybrid Alternative exceeds 100 acres (Authority and FRA 2011e). Therefore, implementation of this alternative would have greater effect on this resource than implementation of the UPRR/SR 99 Alternative, but somewhat less than that arising from implementation of the BNSF Alternative.

Downtown Merced Station

The substrate underlying Downtown Merced is mapped as predominantly moderate paleontological sensitivity. Holocene sediment of low sensitivity is also present and, as is typical of urban areas, fill and disturbed sediment lacking paleontological sensitivity is expected to extend to greater depth in the City of Merced than in the surrounding rural areas. This material is expected to entirely lack paleontological resources.

Downtown Fresno Station Alternatives

The area of the Downtown Fresno Station alternatives is underlain by Pleistocene nonmarine sediment (less than 10%) and the Great Valley Sequence (more than 90%). These are both designated as having moderate paleontological sensitivity for the purpose of this analysis. In the urbanized areas fill and disturbed sediment is expected to extend to greater depth than in rural areas. This material is expected to entirely lack paleontological resources.

Heavy Maintenance Facility Alternatives

Like the other project components, the proposed HMF sites overlie sediments possessing chiefly moderate paleontological sensitivity (94% to 100% of their areas; Table 3.17-8). The Gordon-Shaw site overlies the greatest proportion of high paleontological sensitivity sediment (3%), whereas the Castle Commerce Center, Fagundes, and Harris-DeJager sites overlie no sediment possessing high paleontological sensitivity (Table 3.17-8).

3.17.5.4 Project Impacts

Archaeological Resources

Archaeological sites would only be subject to adverse effects during construction activities. Increasing public access to archaeological sites can lead to their intentional or unintentional disturbance or destruction by people who previously would not have been able to enter the property where the site is located. The HST alternatives are not creating new access for any areas that contain archaeological resources. In remote areas, the guide way would be fenced; therefore, it would not provide access for persons to loot sites and would not expose sites to the adverse effects of compaction through pedestrian or vehicular traffic. Because the HST System would not allow anyone but maintenance persons or vehicles within the operating corridor, it is unlikely that operation of the HST would affect archaeological sites. The related roadway modifications would not cause more traffic near identified archaeological sites. There is a possibility for new sites to be discovered during construction, but these would be managed under supervision of a trained archaeologist to record sites and treat artifacts according to the PA and associated MOA and treatment plan. Therefore, project operation would not result in effects on archaeological resources under NEPA or CEQA.

Historic Architectural Resources

Adverse effects on historic architectural resources will largely occur during construction activities, but there is potential for both vibration and noise impacts generated during operation of the HST. HST projects typically generate significantly fewer vibration impacts as compared with noise impacts. Because of the low-vibration generating HST technologies, vibration impacts would be limited to within 45 to 50 feet of the HST corridor in urban environments. Because the proposed corridor is 100 feet wide, and it is anticipated that resources within the corridor would be removed, there would be no historic architectural resources subjected to vibration impacts. Therefore, there would be no effects on historic properties (Section 106) and less than significant impacts on historical resources (CEQA) (see Section 3.4, Noise and Vibration).

Operational noise has the potential to cause adverse effects or substantial adverse change to historic properties and historical resources. Historic properties and historical resources that are sensitive to noise include resources such as residences, parks, libraries, museums and schools. These types of resources have an inherent quiet nature that is part of their identification as well as their significance. There is only one historic property which may be considered potentially sensitive to increases in noise and that is Roeding Park. It is anticipated that operational noise could cause a substantial adverse change (CEQA) and a substantial impact under NEPA (see Section 3.4, Noise and Vibration).

UPRR/SR 99, BNSF, and Hybrid Alternatives

One built environment resource would be adversely affected by noise activities associated with the UPRR/SR 99, BNSF, and Hybrid alternatives between Merced and Fresno, as shown in Table 3.17-9. Property No. 15, Roeding Park, is adjacent to the proposed alignment and according to FRA Noise Impact Criteria, would experience severe noise impacts (see Section 3.4, Noise and Vibration). As described in Section 3.4, Noise and Vibration, noise impacts are anticipated to be severe without mitigation, which would be decided on in consultation with the City of Fresno (see Section 3.15, Parks, Recreation, and Open Space).

Disturbance of Paleontological Resources

Because impacts on paleontological resources occur from excavations and similar deep ground disturbance, and because these activities are restricted to the construction phase, no impacts on paleontological resources would occur during the operational phase of the project.

3.17.6 Mitigation Measures

The HST project has considered avoidance and minimization measures consistent with the 2005 Statewide and 2008 Bay Area to Central Valley Program EIR/EIS commitments. There are several regulatory requirements that must be followed during construction of any federal- and state-funded project, including NEPA and Section 106. In addition, the following options for treatment of adverse effects are available to compensate for impacts that cannot be avoided. Cultural resources mitigation measures can occur prior to, during, and following construction. Protective measures, such as building stabilization or archaeological site capping, and recordation of resources would take place prior to construction; other protective measures such as vibration monitoring for built resources or monitoring for archaeological resources during ground-disturbing activities occur during construction. Mitigation that could take place after construction may include interpretive programs, including displays, interpretive signage, etc.

The PA establishes the framework for the development and implementation of measures to avoid, minimize, and/or mitigate adverse effects on historic properties caused by the HST System, in compliance with Section 106 and NEPA. The PA also establishes that a MOA will be prepared for the Merced to Fresno Section to detail the HST project commitments to implement these mitigations. The MOA for this section will be tiered from the PA and the Statewide and Bay Area to Central Valley Program EIR/EIS and is being developed in consultation with the SHPO and the ACHP. The MOA will be prepared in the Fall of 2011.

Per the PA, treatment plans will also be prepared for the Merced to Fresno Section: an Archaeological Treatment Plan (ATP) and a Built Environment Treatment Plan (BETP). The MOA and the treatment plans would describe the mitigation and treatment activities associated with the project. The MOA will include input from signatories, consulting and concurring parties and other interested members of the public in the development of appropriate treatment measures.

The ATP and BETP would provide a detailed description of mitigation measures for historic properties (Section 106) and historical resources (CEQA) adversely affected by the project. The plans would include descriptions of measures that would be implemented to mitigate adverse effects and impacts on historic properties and historical resources. The ATP would focus on the treatment of known buried historic properties and guidance in the event of unanticipated discoveries. The BETP would be based on preconstruction investigations that include, but are not limited to, conditions assessments; vibration analysis; and requirements for the moving, storing, shoring, stabilizing, monitoring, and rehabilitation or restoration of buildings. The ATP and BETP would also outline the provisions of the other mitigation measures to be carried out for this project, such as responses to inadvertent damage, or interpretation mitigation (see mitigation measures below). The treatment plans would be completed prior to construction activities that could adversely affect historic properties or historical resources, and would likely include one or more of the mitigation measures listed below.

For paleontological resources, Society of Vertebrate Paleontology guidelines (SVP 1995) establish a basic framework for mitigation of impacts on paleontological resources that are widely adopted. These include selection of a qualified paleontologist to supervise mitigation activities and the development of a project- or phase-specific Paleontological Resources Monitoring and Mitigation Plan that would include protocol for monitoring of construction excavations in paleontologically sensitive sediment. In addition, there are procedures to follow should a paleontological discovery be made, including evaluation to establish the scientific significance of the find, construction-avoidance during recovery, scientific recovery, and recording and curation of the find.

3.17.6.1 Archaeological Resources

Arch-MM#1: Conduct Archaeological Training

Prior to ground-disturbing activities within the project alternatives, a qualified professional archaeologist, who meets the SOI's Standards for Archaeology, will develop a training program and printed material to

be presented to construction personnel. The purpose of this training and accompanying materials will be to familiarize construction personnel with the relevant legal (Section 106/NEPA/CEQA) context for cultural resources of the project and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. These training sessions will be conducted prior to commencing construction within discrete portions of the project alternatives or as needed as construction personnel crews and supervisors may change.

Arch-MM#2: Halt Work in the Event of an Archaeological Discovery

If any cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resources would halt, and the project proponent would consult with a qualified archaeologist to assess the significance of the find, according to CEQA Guidelines Section 15064.5, and any work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is being carried out. If any find is determined to be significant, the project proponent and the archaeologist will meet to determine the appropriate avoidance measures or other appropriate mitigation in conjunction with the SHPO. All significant cultural materials recovered would be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards as determined in the project MOA. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts on historical resources or unique archaeological resources, determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations.

If in consultation with the consulting archaeologist, it is determined that a significant archaeological resource is present and that the resource could be adversely affected by the proposed project, the following actions may be followed, as feasible:

- If prudent and feasible, redesign the project to avoid any adverse effect on the significant archaeological resource.
- Implement Arch-MM#3, Intentional Site Burial for Site Preservation.
- Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive use than research significance and that interpretive use of the resource is feasible). If the circumstances warrant an ADRP, such a program will be conducted. Together with a project archaeologist, determine the scope of the ADRP. The archaeologist would prepare a draft ADRP. The ADRP would identify the scientific/historical research questions that are applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Pursuant to Section VIII(C)(1) of the PA, the Authority shall provide the ADRP, as an element of the treatment plan prepared for the section, to the MOA signatories and MOA concurring parties for review and comment. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods will not be applied to portions of the archaeological resources if nondestructive methods are practical.

Arch-MM#3: Plan an Intentional Site Burial Preservation In-Place

If project engineering concludes that avoidance is not feasible, a process to determine whether the site can be preserved through intentional site burial would be considered. When complete avoidance is not possible, preservation in-place is the preferred form of mitigation for an “historical resource of an archaeological nature” because it retains the relationships between artifact and context, and may avoid conflicts with groups associated with the site, pursuant to PRC 15126.4(b)(3)(A).

To intentionally bury a site, it will be necessary to conduct test excavations to determine the vertical and horizontal extent of the identified resources discovered as planning proceeds or through accidental discovery. If excavations have not yet been conducted for the purposes of evaluating the sites for eligibility in accordance with the Section 106 PA, the Authority will contract with a qualified archaeologist

to conduct a formal excavation of the site to delineate the site boundaries as well as determine the site's eligibility for the CRHR or NRHP.

If found to be eligible and avoidance is not possible, consideration will be given to intentional site burial. The contracted archaeologist will, in addition to the formal delineation of the site boundaries, prepare and implement a design plan to dictate the conditions of the intentional site burial according to the recommendations discussed in the *National Park Service Technical Brief Number 5, Intentional Site Burial: A Technique to Protect Against National or Mechanical Loss* (Thorne 1991).

Among the requirements of an effective capping, the mechanical process of burying the site must be designed in a manner that will ensure that the site matrix is protected during the placement process and during the operation of the HST. Preconstruction testing can be used to determine the construction equipment and fill-material load limits that are allowable without causing compression or warpage of the artifact and feature components of the site.

If the preconstruction testing determines that compression or warpage of the site is probable and this mitigation will not effectively reduce the effects of the project to less than significant levels, additional mitigation, such as data recovery, will be necessary. Furthermore, if it is determined that the engineering requirements of the construction and operation of the HST at the location of the site prohibit the effective avoidance of the site, or if the surrounding conditions prohibit the protection or preservation of the archaeological components, the mitigation of data recovery would be the only feasible mitigation (see Arch-MM#2 above). In addition, the Authority will make provisions with the contracted archaeologist to monitor the site after the burial process is completed.

Arch-MM#4: Conduct Archaeological Monitoring in Proximity to Identified Sites or Areas of Sensitivity

Ground-disturbing activities that have the potential to affect archaeological remains may occur in areas that have been identified as either the location of a known archaeological site, or as an area known to be sensitive for the presence of buried cultural resources. The Authority shall retain the services of a qualified archaeological monitor who shall be present during all ground-disturbing construction activities occurring in native sediments/soils.

In the event that cultural resources are exposed during construction, the monitor shall be empowered to temporarily halt activities in the immediate vicinity of the discovery while it is evaluated for significance. If the archaeologist determines that the cultural resources exposed are unique archaeological resources as defined by Section 21083.2 of CEQA, then the archaeologist shall conduct additional excavations to avoid impacts on these resources by the development. If they are not "unique," then no further mitigation would be required. Unique cultural resources shall be determined based on the criteria set forth in Section 21083.2 of CEQA. Where necessary, the Authority would seek Native American input and consultation.

3.17.6.2 Historic Architectural Resources: Avoidance, Minimization, and Mitigation Measures

Hist-MM#1: Avoid Adverse Vibration Effects

The HST project will develop construction methods to avoid indirect adverse effects or indirect substantial adverse change to any historic properties (Section 106) or historical resources (CEQA) from vibration caused by construction activities. Vibration from impact pile-driving during construction is anticipated to reach up to 0.12 peak particle velocity of one inch per second (PPV in/sec) at 135 feet from the project centerline, a level that would could cause the physical destruction, damage, or alteration of historic properties or historical resources, if the pile-driving were within 80 to 140 feet of the building. Because this impact pile-driving could cause adverse effects or substantial adverse changes, alternative construction methods causing less than 0.12 PPV in/sec measured at the receptor will be developed for construction activities near historic properties or historical resources if they are determined to be extremely susceptible to vibration damage (Authority and FRA 2011f). The development of alternative construction methods at

these locations would avoid indirect adverse vibration effects on historic properties (Section 106) and would avoid substantial adverse vibration changes to historical resources (CEQA).

Hist-MM#2: Develop Protection and Stabilization Measures

The BETP will identify historic properties/historical resources that will require protection and/or stabilization prior to the start of construction of the project. Properties subject to this mitigation activity will include any properties physically affected, and/or relocated, and/or in close enough proximity to require protection. This mitigation will ensure that adverse effects on historic properties/historical resources will be either avoided entirely, or minimized to the extent possible. This mitigation will be developed in consultation with the landowner, land-owning agencies, as well as SHPO and the MOA signatories, as required by the PA. Such measures will include, but are not necessarily limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off resources from construction activities such as traffic, equipment storage, and personnel; shielding resources from dust or debris; and stabilization of buildings adjacent to construction. For buildings that are to be moved, such measures will include stabilization of buildings and structures before, during, and after relocation; protection of buildings and structures during temporary storage; and relocation at a new site and during subsequent rehabilitation. Moving buildings could result in minor impacts on air emissions from equipment and vehicles and minor effects on developed or undeveloped sites.

Hist-MM#3: Minimize Adverse Effects through Relocation of Historic Structures

The BETP will identify historic properties/historical resources that will be relocated to help avoid destruction and minimize the direct adverse effect of their physical damage or alteration. The plan for relocation and implementation of relocation will take place prior to construction. The relocation of the historic properties/historical resources will take into account the historic site and layout (i.e., the orientation of the buildings to the cardinal directions), as well as their potential re-use. All structures will be thoroughly recorded in a Historic Structure Report (HSR) (see below), and the relocation plan will provide for stabilization of the structures before, during, and after the move.

Hist-MM#4: Minimize Adverse Noise Effects

The BETP will identify historic properties/historical resources that will be subject to treatment to help minimize indirect adverse effects caused by operational noise of the HST project. Properties subject to this mitigation will be identified in the BETP and will be identified and treated in consultation with the landowner, or land-owning agencies, and the CEQA lead agency. Project design options will be developed to help reduce noise impacts and will follow FRA methodologies for noise abatement. These options will be developed during project design and will be implemented during construction. Historic properties/ historical resources subject to this mitigation measure will be thoroughly recorded in the appropriate format of the Historic American Building Survey (HABS)/Historic American Engineering Record (HAER)/ Historic American Landscape Survey (HALS) programs (see Hist-MM#7, below) prior to construction of the HST project.

Hist-MM#5: Prepare and Submit NRHP Nominations

The BETP will identify specific historic properties/historical resources for nomination to the NRHP Program of the NPS. Properties subject to this mitigation will be identified in the BETP and will be identified and treated in consultation with the landowner, or land-owning agencies, and the CEQA lead agency. Current photographs of the property used in the nomination(s) will be made prior to the start of project construction. The nomination document may also use other current and/or historic images prepared as part of other mitigation activities.

Hist-MM#6: Prepare and Submit CRHR Nominations

The BETP would identify specific historical resources for nomination to the CRHR Program at the State Office of Historic Preservation. Current photographs of the resource used in the nomination(s) would be

made prior to the start of construction. The nomination document may also use current and/or historic images prepared as part of other mitigation activities.

Hist-MM#7: Prepare and Submit Historic American Building Survey (HABS)/Historic American Engineering Record (HAER)/Historic American Landscape Survey (HALS) Documentation

Historic properties/historical resources that would be physically altered, damaged, relocated, or destroyed by the project may be documented in compliance with the HABS/HAER/HALS programs. Prior to the start of construction, in consultation with the Western Regional Office of the NPS, Oakland, California, large-format (4 x 5 inch, or larger, negative-size) black and white photographs would be taken of these historic properties/historical resources showing them in context, as well as details of character-defining features. The photographs would be processed for archival permanence in accordance with HABS/HAER/HALS photographic specifications. Each view would be fully captioned, and if necessary, perspective corrected. Oblique aerial photography would be considered as a photographic recordation option in these coordination efforts.

The recordation would follow the NPS HABS/HAER/HALS guidelines; the report format, views, and other documentation details would be coordinated with the NPS. It is anticipated that the recordation of historic properties would be completed to Level II HABS written data standards, and would include archival and digital reproduction of historic images, plans, and drawings, if available. Copies of the documentation would be offered to the appropriate local governments, historical societies and agencies, and libraries. The documentation would also be offered in printed and electronic form to any repository or organization upon which SHPO, the Authority, and local agency with jurisdiction over the property, through consultation, may agree. The electronic copy of the report may also be placed on an agency or organization's web site.

Hist-MM#8: Prepare Historic Structure Reports

The BETP would identify historic properties/historical resources that would be physically altered, damaged, or relocated that would be subject to an HSR. The HSR would be prepared prior to the start of construction. The HSR would follow the general guidelines for such reports as described in the California Office of Historic Preservation (OHP) publication, "Historic Structure Report Format" (OHP n.d.). The scope of each HSR would be developed in consultation with the land-owning agencies, and copies of the reports would be provided to the same. The HSR would include, if appropriate, documentation of existing landscaping. The HSRs may be used in the ongoing planning process and re-use of the properties, and may be coordinated with the other mitigation documentation activities, such as HABS/HAER records.

Hist-MM#9: Prepare Interpretive Exhibits

Some historic properties/historical resources may be identified in the BETP for historic interpretation. Interpretive exhibits would provide information regarding the specific historic property or historical resource. The interpretive exhibits would utilize images, narrative history, drawings, or other material produced for the mitigation described above, including the HABS/HAER reports, NRHP and CRHR nominations, or other archival sources. The interpretive exhibits may be in the form of, but are not necessarily limited to, interpretive display panels and/or printed material for dissemination to the public. The interpretive exhibits may be installed at local libraries, historical societies, or public buildings.

All historic properties/historical resources demolished by the project would be the subject of informative permanent metal plaques that will be installed at the site of the demolished historic property, or at nearby public locations. The plaques would provide a brief history of the property, its engineering/architectural features and characteristics, and the reasons for and date of its demolition.

Hist-MM#10: Plan Repair of Inadvertent Damage

The BETP would provide a plan for the repair of inadvertent damage to historic properties/historical resources. The plan would be developed prior to construction so damage resulting from the project to

any of the historic properties/historical resources near construction activities would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation. The HSR, and/or HABS/HAER recordation would photographically document the condition of historic properties/historical resources prior to the start of construction to establish the baseline condition for assessing damage. A copy of this photographic documentation would be provided to the landowner or land-owning agencies. Prior to implementation, provide the plans for any repairs to historic properties for SHPO review and comment to ensure conformance with the SOI's Standards for Rehabilitation.

3.17.6.3 Paleontological Resources

Pale-MM#1: Engage a Paleontological Resources Specialist to Direct Monitoring during Construction

At least 120 days prior to construction, designate a paleontological resources specialist (PRS) for the project, the responsibility of whom it is to determine where and when paleontological resources monitoring should be conducted. Paleontological resources monitors (PRMs) would be selected by the PRS based on their qualifications, and the scope and nature of their monitoring would be determined and directed based on the Paleontological Resource Monitoring and Mitigation Plan (PRMMP). The PRS would be responsible for developing and implementing the Worker Environmental Awareness Program Training. All management and supervisory personnel and construction workers involved with ground-disturbing activities would be required to take this training prior to beginning work on the project and would be provided with the necessary resources response in case paleontological resources are found during construction. The PRS would document any discoveries, as needed, evaluate the potential resource, and assess significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5.

Pale-MM#2: Prepare and Implement a Paleontological Resource Monitoring and Mitigation Plan (PRMMP)

Paleontological monitoring and mitigation measures are restricted to those construction-related activities that would result in the disturbance of paleontologically sensitive sediments. The PRMMP would include a description of when and where construction monitoring would be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; preconstruction coordination procedures; and procedures for reporting the results of the monitoring and mitigation program.

In general, the monitoring program would reflect site-specific construction of the selected option. The PRMMP would be consistent with Society of Vertebrate Paleontology guidelines (SVP 1995) for the mitigation of construction-related impacts on paleontological resources. The PRMMP would also be consistent with the SVP (1996) conditions for receivership of paleontological collections and any specific requirements of the designated repository for any fossils collected.

Pale-MM#3: Halt to Construction when Paleontological Resources Are Found

If fossil or fossil-bearing deposits are discovered during construction, regardless of the individual making a paleontological discovery, construction activity in the immediate vicinity of the discovery will cease. This requirement will be spelled out in both the PRMMP and the Worker Environmental Awareness Program. Construction activity may continue elsewhere provided that it continues to be monitored as appropriate. If the discovery is made by someone other than a PRM or the PRS, a PRM or the PRS will immediately be notified.

3.17.7 NEPA Impact Summary

3.17.7.1 Cultural Resources

Soil excavation or compaction resulting from the use of heavy machinery on the construction site itself or in staging areas may affect the integrity of artifact-bearing deposits associated with known and as yet undiscovered archaeological sites. This would be a substantial adverse impact.

Creating the potential for archaeological deposits to be revealed, exposing them to potential looting, more traffic, and compaction would also be a substantial adverse impact.

Construction effects can result in reduced use of historic structures, which in turn might allow them to deteriorate. These effects can diminish the eligibility of the resources for the NRHP, which is a substantial adverse impact under NEPA.

Material or physical alteration, especially demolition of an NRHP-listed or eligible property would be a substantial adverse effect under NEPA. Alteration of the visual setting when it is part of the property's significance would result in a moderate adverse effect under NEPA. Other permanent effects, such as those that could directly alter the physical integrity, use, or setting of historic architectural resources, also result in moderate to substantial adverse effects and would occur if specific HST alternatives are implemented. The UPRR/SR 99, BNSF, and Hybrid alternatives would cause an adverse effect on six of the Section 106 historic properties. The UPRR/SR 99 Alternative would cause an adverse effect on two additional Section 106 properties that are located exclusively in that alignment.

To the extent that visual effects and vibration could degrade the elements that make the resource eligible, these long-term effects would be moderate and adverse.

Noise effects that could degrade the elements that make the resource eligible would also result in an indirect adverse impact. The UPRR/SR 99, BNSF, and Hybrid alternatives would only cause noise effects on one historic property, Roeding Park.

As discussed in Section 3.17.3.4, although actions determined to have an adverse effect under NEPA may be mitigated and have a lesser effect, for Section 106, the effect determination remains adverse even when mitigated.

3.17.7.2 Paleontological Resources

Absent appropriate mitigation measures, the destruction of a fossil deposit as a result of construction-related activities could be a significant adverse effect on non-renewable paleontological resources that possess both scientific as well as educational values. Because fossils have scientific and educational values, those values can be largely recovered by the controlled collection and investigation of fossils after discovery, and by their curation into a qualified museum. Therefore, mitigation measures Pale-MM#1 through Pale-MM#3 will reduce potential adverse impacts on paleontological resources to a less than significant level. With these measures, the resources would be available for subsequent scientific study and educational use, and the values of the resources largely realized. Therefore, implementation of mitigation measures Pale-MM#1 through Pale-MM#3 will reduce potential adverse impacts on paleontological resources to a level well below that of significant.

3.17.8 CEQA Significance Conclusions

Table 3.17-10 summarizes cultural- and paleontological-related impacts, associated mitigation measures, and the level of significance after mitigation. After mitigation, impacts related to cultural resources would be significant and unavoidable under CEQA when historic structures are demolished.

Table 3.17-10
Summary of Significant Cultural and Paleontological Impacts and Mitigation Measures

Impact	CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Arch#1: Effect on Significant Prehistoric and Historic-Era Archaeological Resources During Construction The HST alternatives would affect archaeological resources as follows: UPRR/SR 99: 11 resources; BNSF: 6 resources; HMF 3 resources; and Hybrid: 6 resources.	Significant	**Arch-MM#1:** Conduct Archaeological Training; **Arch-MM #2:** Halt Work in the Event of an Archaeological Discovery; **Arch-MM#3:** Plan an Intentional Site Burial Preservation In-Place; **Arch-MM#4:** Conduct Archaeological Monitoring in Proximity to Identified Sites or Areas of Sensitivity	Less than Significant
Pale#2: Effect on Paleontological Resources during Construction The HST alternatives have the potential for significant impacts due to excavations in sediments with moderate and high paleontological sensitivity (Table 3.17-7) Hybrid: Less than BNSF and more than UPRR/SR 99.	Significant	**Pale-MM#1:** Engage a Paleontological Resources Specialist to Direct Monitoring during Construction; **Pale-MM#2:** Prepare and Implement a PRMMP; **Pale-MM#3:** Halt to Construction when Paleontological Resources Are Found	Less than Significant
Hist#1: Effect on Historically Significant Built-Environment Resources During Construction The UPRR/SR 99 Alternative would adversely affect up to 8 resources listed or eligible for the NRHP (Section 106) and 5 historical resources (CEQA). The BNSF alternative would adversely affect up to 6 resources listed or eligible for the NRHP (Section 106) and 5 historical resources (CEQA). The Hybrid alternative would adversely affect up to 6 resources listed or eligible for the NRHP (Section 106) and 5 historical resources (CEQA).	Significant	**Hist-MM#1:** Avoid Adverse Vibration Effects; **Hist-MM#2:** Develop Protection and Stabilization Measures; **Hist-MM#3:** Minimize Adverse Effects through Relocation of Historic Structures; **Hist-MM#4:** Minimize Adverse Noise Effects; **Hist-MM#5:** Prepare and Submit NRHP Nominations; **Hist-MM#6:** Prepare and Submit CRHR Nominations; **Hist-MM#7:** Prepare and Submit HABS/ HAER/ HALS Documentation; **Hist-MM#8:** Prepare Historic Structure Reports; **Hist-MM#9**: Prepare	Significant and Unavoidable

Impact	CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
		Interpretive Exhibits; **Hist-MM#10:** Plan Repair of Inadvertent Damage	
Hist#2: Effect on Historically Significant Built-Environment Resources During Operation The UPRR/SR 99, BNSF and Hybrid Alternatives would indirectly adversely affect 1 resource listed or eligible for the NRHP (Section 106) and 0 historical resources (CEQA).	Significant	**PK-MM#4:** Address Noise at Roeding Park with City of Fresno	Less than Significant with mitigation. It is possible that the City of Fresno would view the projected noise levels as acceptable and preferable to the implementation of mitigation measures. In this case, the impacts on Roeding Park, both as a park and a historic resource, would remain significant under CEQA.