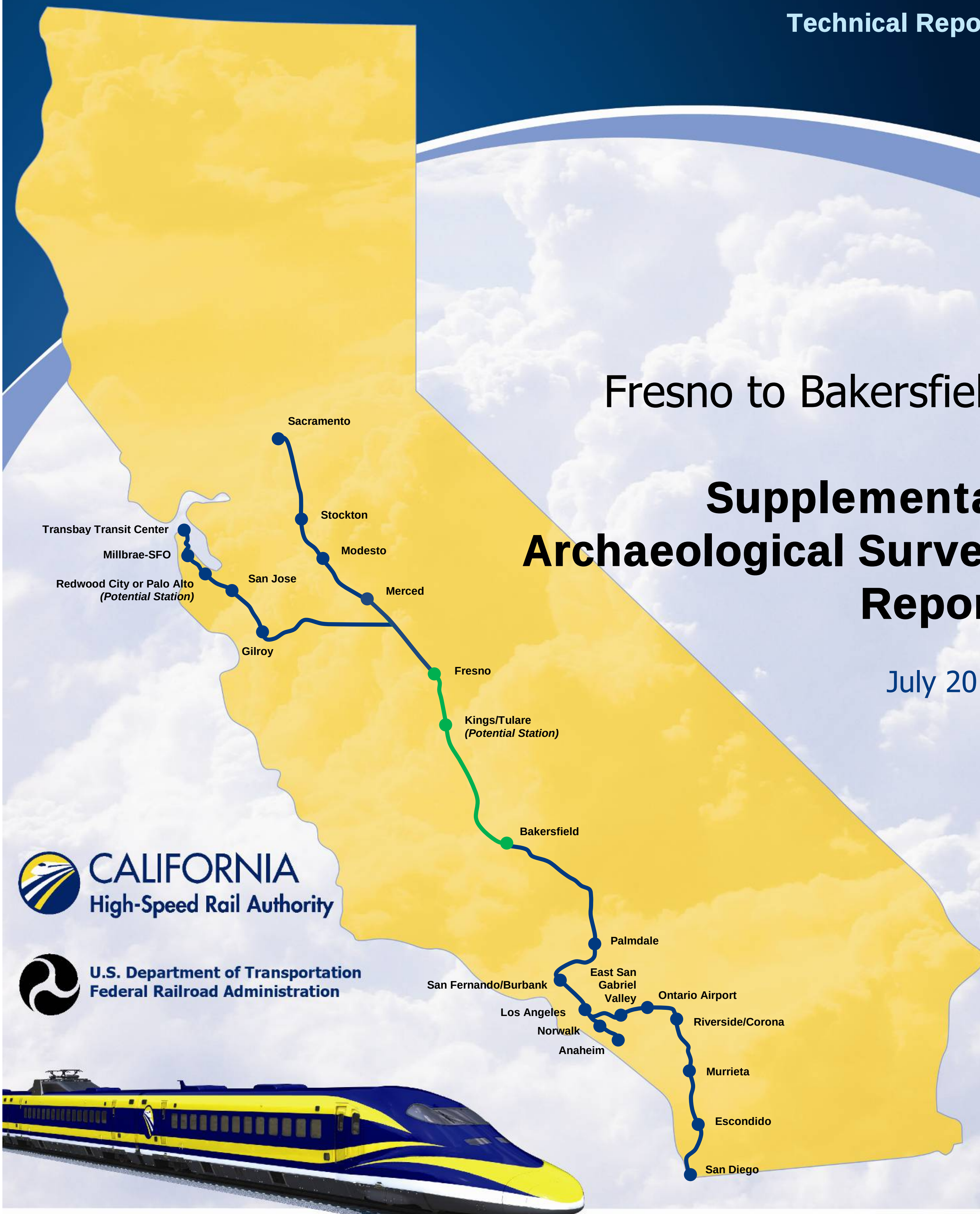
CALIFORNIA HIGH-SPEED TRAIN

Technical Report



Fresno to Bakersfield

Supplemental Archaeological Survey Report

July 2012

CALIFORNIA
High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

Fresno to Bakersfield

Supplemental Archaeological Survey Report

Prepared by:

URS/HMM/Arup Joint Venture

July 2012

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Acronyms and Abbreviations

AMSL	above mean sea level
APE	area of potential effects
ASR	Archaeological Survey Report
AT&SF	Atchison Topeka and Santa Fe Railroad
Authority	California High-Speed Rail Authority
B.P.	before the present
BNSF	BNSF Railway
ca.	circa
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CRHR	California Register of Historical Resources
CRI	Chinatown Revitalization Inc. of Fresno
CVP	Central Valley Project
EIR	environmental impact report
EIS	environmental impact statement
FRA	Federal Railroad Administration
GIS	geographical information system
GPR	ground-penetrating radar
GPS	global positioning system
HMF	heavy maintenance facility
HST	high-speed train
MOA	Memorandum of Agreement
NRHP	National Register of Historic Places
OHP	California Office of Historic Preservation
PA	Programmatic Agreement
PTE	permission to enter
RPA	Registered Professional Archaeologist
sASR	Supplemental Archaeological Survey Report

Section 106 PA	*Section 106 Programmatic Agreement among the Federal Railroad Administration, the Advisory Council on Historical 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*
SHPO	State Historic Preservation Office/Officer
SP	Southern Pacific
SR	state route
SSJVIC	South San Joaquin Valley Information Center
Statewide Program EIR/EIS	*Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System*
TPS	traction power substation
USGS	U.S. Geological Survey

Chapter 1.0
Introduction

1.0 Introduction

As per Section VI[C][4] of the Section 106 Programmatic Agreement (Section 106 PA) (Authority and FRA 2011d), a supplemental Historic Properties Survey Report and a supplemental Archaeological Survey Report (ASR) are required if there are changes to the Area of Potential Effects (APE) that either include properties not exempt from evaluation or that involve areas that may include additional historical properties within the APE. Therefore, the following supplemental report—henceforth referred to as the *California High-Speed Train Fresno to Bakersfield Supplemental Archaeological Survey Report (sASR)*—describes efforts to identify and evaluate cultural resources that may be affected by the California High-Speed Train (HST) Project, Fresno to Bakersfield Section, for alternatives that were introduced after the October 2011 distribution of the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report (ASR)* (Authority and FRA 2011b) to the State Historic Preservation Office (SHPO). The findings provided in the October 2011 ASR were reviewed and concurred with by the SHPO (Donaldson 2012). This sASR is being prepared in conjunction with the recirculation of the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), which also addresses the changes to the APE with respect to its potential to affect historic properties.

While the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report (ASR)* (Authority and FRA 2011b) addressed the overall project that consisted of a series of alternative alignment footprints from Fresno to Bakersfield (Figure 1-1; Appendix A), this particular document focuses on the addition of the revised BNSF Alternative, the Hanford West Bypass 1 and Hanford West Bypass 2 alternatives, and the Bakersfield Hybrid Alternative between Fresno to Bakersfield. The revisions to the project along the BNSF Alternative are manifold throughout the length of this alternative and represent a required shift in the distance between the BNSF Railway's existing infrastructure and the proposed HST to 102 feet. The following supplemental report only addresses cultural resources associated with those aspects of the project that have changed since the October 2011 version of the ASR. As such, this report will refer to the original ASR as appropriate for details covering the environmental, cultural, and geological settings.

Under the National Environmental Policy Act, the Federal Railroad Administration (FRA) is the federal lead agency. As a federal undertaking (defined at 36 CFR Part 800.16[y]), this project must comply with the requirements of the National Historic Preservation Act of 1966 Section 106 as well as with the California Environmental Quality Act (CEQA). The purpose of this document, therefore, is to support the FRA's request for concurrence from the SHPO with the FRA's determination of eligibility or non-eligibility of those properties within the APE for inclusion in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) and with the FRA's determination of the proposed undertaking's effect on those properties pursuant to 36 CFR 800.4 and 36 CFR 800.5.

Because the HST project is geographically extensive and is being developed in a series of sections, a programmatic agreement (Authority and FRA 2011d) was developed to coordinate all aspects of the cultural resources process and to provide a common format for resource identification, documentation, evaluation, mitigation, and consultation for the project as a whole (Authority and FRA 2011d:Appendix B). The Section 106 PA was signed on June 15, 2011.

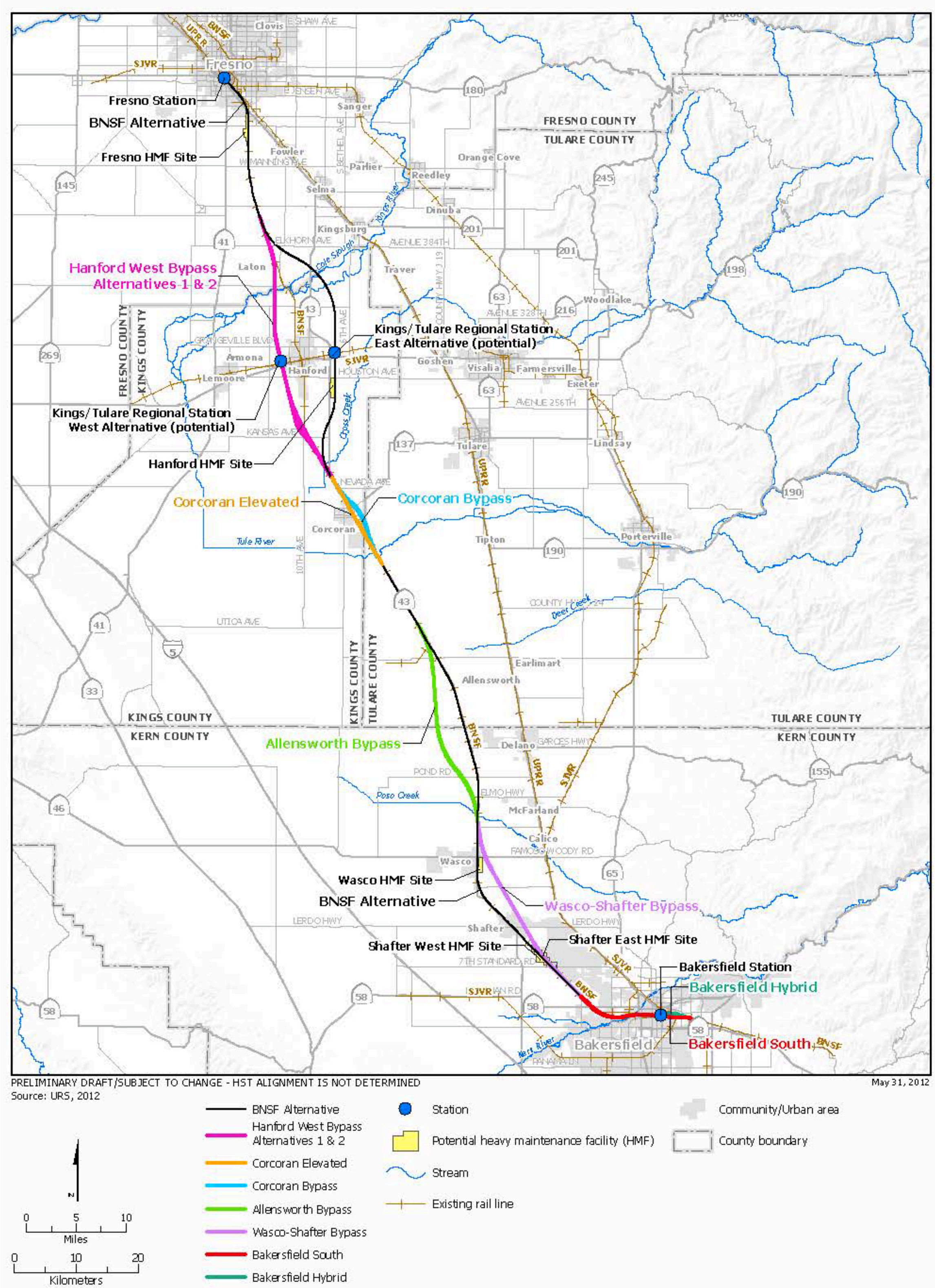

Figure 1-1
Fresno to Bakersfield HST alternatives

The provisions of the Section 106 PA include supervision of archaeological efforts by a professional archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards, conducting consultation with Native Americans and other parties such as local museums and historical societies, defining the Area of Potential Effects (APE), and identifying methods for the identification and evaluation of historic properties. These steps have been followed in the conduct of this investigation to date. However, despite multiple field sessions (February 2010, April 2010, August 2010, and December 2011), the lack of access to properties requiring field survey has prevented completion of some of the provisions in the Section 106 PA as of the date of this report. This document follows the outline and content for the Archaeological Survey Report (ASR) stipulated in Attachment C, Part B, of the Section 106 PA.

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Chapter 2.0
Summary of Findings

2.0 Summary of Findings

2.1 NRHP-Eligible Resources

No cultural resources that are considered NRHP-eligible resources have been identified by background research or field efforts within the current APE. As stipulated in the Section 106 PA, Section VIII [A][1], a phased identification effort will be necessary as access is granted and where adverse effects are likely to occur, and further evaluation of identified resources may be necessary at that time (Authority and FRA 2011d). This phasing will be coordinated through the establishment of a Memorandum of Agreement (MOA) and is not addressed further in the present document.

2.2 NRHP-Recommended Not-Eligible Resources

Table 2-1 lists those archaeological sites that have been identified in the entire APE as it is defined currently. Therefore, the table lists those sites addressed in the original ASR's APE that were previously submitted for eligibility determination as part of that document as well as the sites identified in the sASR APE. An asterisk in the table indicates that SHPO concurred with the eligibility determination presented in the original ASR

For the purposes of this sASR, three sites—CA-KIN-69H, CA-TUL-473, and HW-JR-1—were identified in the APE (either through background research or field efforts) that do not appear to contain values or conditions that would make them eligible for listing in either the NRHP or CRHR. These sites are considered not eligible for NRHP/CRHR listing for the following reasons:

- Lack of integrity and/or because they lack associations with events or people significant in California or national history.
- Lack the distinctive characteristics of a type, period, or method of construction.
- Do not represent the work of a master or possess high artistic values.
- Would not yield information important to prehistory or history.

Table 2-1
Summary of Findings for Archaeological Sites within the APE (Direct Impact Footprint)

Trinomial	Primary Number	Resource Name (by recorder)	Description	Basis of Recommendation	NRHP Eligibility Recommendation
CA-KER-2507	P-15-2507	Pro-3	Prehistoric/ethnographic village site	Site reported historically but recorded as destroyed	Not Eligible
CA-TUL-2950H	4737	Stoil Site	Early 20th-century Standard Oil Company pumping and rail station	Previous recording and determination adopted by CEQA lead agency	Not Eligible*
CA-KIN-69H	P-16-68	None	Historic trash scatter	Lack of significant associations	Not Eligible
CA-TUL-473		None	Sparse prehistoric artifact scatter	Site destroyed at time of recordation; inundated by irrigation district ponds	Not Eligible

Table 2-1
Summary of Findings for Archaeological Sites within the APE (Direct Impact Footprint)

Trinomial	Primary Number	Resource Name (by recorder)	Description	Basis of Recommendation	NRHP Eligibility Recommendation
N/A	N/A	HW-JR-1	Foundations/ Structure pads	Lack of significant associations	Not Eligible
N/A	N/A	HST-TUL-1	Sparse lithic scatter	Subsurface investigations determined that no additional resource types or features were present and that the site was heavily disturbed; no potential to yield data and no integrity.	Not Eligible*
N/A	N/A	HST-TUL-3	Sparse prehistoric artifact scatter dominated by thinning flakes, with one shell and one stone bead identified.	Subsurface investigations determined that no subsurface artifacts or features were present and that the site was heavily disturbed; no potential to yield data and no integrity.	Not Eligible*

Notes: *SHPO concurred with the finding of non-eligibility as part of the ASR (Authority and FRA 2011b; Donaldson 2012)

Acronyms and Abbreviations:

APE = Area of Potential Effects
N/A = not applicable
NRHP = National Register of Historic Places

2.3 Unevaluated Resources

No cultural resources that have been identified by background research or field efforts remain unevaluated within the current APE. As stipulated in the Section 106 PA, Section VIII [A][1], a phased identification effort for additional cultural resources will be necessary as access is granted and where adverse effects are likely to occur; further evaluation of identified resources may be necessary at that time. This phasing will be coordinated through the establishment of a MOA and is not addressed further in the present document.

Chapter 3.0
Project Description

3.0 Project Description

3.1 Project Introduction

The Fresno to Bakersfield Section of the HST project would be approximately 114 miles long, varying in length by only a few miles based on the route alternatives selected. To comply with the California High Speed Rail Authority's (Authority's) guidance to use existing transportation corridors when feasible, the Fresno to Bakersfield HST Section would primarily be located adjacent to the existing BNSF Railway right-of-way. The following three alternative alignments were introduced to avoid environmental, land use, or community impacts identified for portions of the BNSF Alternative: revised BNSF Alternative, Hanford West Bypass 1 and 2, and the Bakersfield Hybrid Alternative.

The additional alternatives reported herein for the Fresno to Bakersfield HST Section would cross both urban and rural lands, and include a station in both Fresno and Bakersfield, a potential Kings/Tulare Regional Station in the vicinity of Hanford, a potential heavy maintenance facility (HMF), and power substations along the alignment. The HST alignment would be entirely grade-separated, meaning that crossings with roads, railroads, and other transport facilities would be located at different heights (overpasses or underpasses) so that the HST would not interrupt or interface with other modes of transport. The HST right-of-way would also be fenced to prohibit public or automobile access. The project footprint would consist primarily of the train right-of-way, which would include both a northbound and southbound track in an area typically 100 feet wide. Additional right-of-way would be required to accommodate stations, multiple track at stations, maintenance facilities, and power substations.

These alternatives for the Fresno to Bakersfield Section would include at-grade, below-grade, and elevated track segments. The at-grade track would be laid on an earthen rail bed topped with rock ballast approximately 6 feet off the ground. Fill and ballast for the rail bed would be obtained from permitted borrow sites and quarries. Below-grade track would be laid in an open or covered trench at a depth that would allow roadway and other grade-level uses above the track. Elevated track segments would span long sections of urban development or aerial roadway structures, and consist of steel truss aerial structures or guideway structures with cast-in-place reinforced-concrete columns to support the guideway box girders and platforms. The height of elevated track sections would depend on the height of existing structures below, and would range from 40 to 80 feet. Columns would be spaced 60 feet to 120 feet apart.

Refer to the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report (ASR)* (Authority and FRA 2011b) for details regarding the project elements related to the Heavy Maintenance Facilities, Corcoran Bypass Alignment, Allensworth Bypass Alignment, Wasco-Shafter Bypass Alignment, and the Bakersfield South Alignment.

3.2 Project Alternatives

3.2.1 Alignment Alternatives

This section describes the additional alternative alignments of the Fresno to Bakersfield HST Section. The project EIR/EIS for the Fresno to Bakersfield HST Section examines alternative alignments, stations, and HMF sites within the general BNSF Railway corridor. Discussion of the HST project alternatives begins with a single continuous alignment (the BNSF Alternative) from Fresno to Bakersfield, which has been revised. Descriptions of the additional alternative alignments that deviate from the revised BNSF Alternative for portions of the route then follow. The alternative alignments that deviate from the revised BNSF Alternative were selected to avoid environmental, land use, or community issues identified for portions of the revised BNSF Alternative (see Figure 1-1).

3.2.1.1 Revised BNSF Alternative

An important objective of the project is to align HST tracks adjacent to existing transportation corridors. The BNSF Alternative is designed to follow the existing BNSF Railway corridor adjacent to the BNSF mainline right-of-way as closely as practicable. Minor deviations from the BNSF Railway route are necessary to accommodate design requirements; namely, wider curves are necessary to accommodate the speed of the HST compared to the existing lower-speed freight line track alignment. Where there would not be a shared right-of-way, the BNSF Alternative now includes a provision for a 102-foot separation of the HST track centerline from the BNSF Railway track centerline.

A 102-foot separation between the centerlines of BNSF Railway and HST tracks is provided wherever feasible and appropriate. In urban areas where a 102-foot separation could result in substantial displacement of businesses, homes, and infrastructure, the separation between the BNSF Railway and HST was reduced. The areas with reduced separation require protection to prevent encroachment on the HST right-of-way, in the event of a freight rail derailment. Protection consists of a swale, berm, or wall, depending on the separation.

3.2.1.2 Hanford West Bypass 1 and 2 Alternative

The Hanford West Bypass 1 Alternative would parallel the BNSF Alternative from East Kamm Avenue to approximately East Elkhorn Avenue in Fresno County. At East Conejo Avenue where the BNSF Alternative crosses to the eastern side of the BNSF Railway tracks to pass the city of Hanford to the east, the Hanford West Bypass 1 Alternative would continue south on the western side of the BNSF Railway tracks. The Hanford West Bypass 1 would diverge from the BNSF Railway corridor just south of East Elkhorn Avenue and ascend onto an elevated structure just south of East Harlan Avenue, crossing over the Kings River complex and Murphy Slough, and passing the community of Laton to the west. The elevated structure would be approximately 0.8 mile in length and reach a maximum height of approximately 40 feet to the top of the rail. The Hanford West Bypass 1 Alternative would return to grade just north of Dover Avenue. The alignment would continue at-grade, curve gently to the east, and travel between the community of Armona to the west and the city of Hanford to the east. The Hanford West Bypass 1 Alternative would rejoin the BNSF Railway corridor on its western side at about Lansing Avenue. The alignment would then ascend onto another elevated structure, traveling over Cross Creek and special aquatic features that exist north of Corcoran. The elevated structure would span approximately 3 miles and reach a maximum height of approximately 20 feet to the top of the rail. This alignment would return to grade just north of Nevada Avenue and would connect to the BNSF Alternative traveling through Corcoran at-grade, on the western side of the BNSF Railway corridor. The total length of the Hanford West Bypass 1 Alternative would be approximately 28 miles.

The Hanford West Bypass 1 Alternative includes a design option where the alignment would be below-grade between Grangeville Boulevard and Houston Avenue. The alignment would travel below-grade in an open cut with side slopes as it transitions to a retained-cut profile, approximately 40 feet below ground level. As the alignment transitions back to grade just north of Houston Avenue, the open-cut profile would be used once more. The alignment would cross State Route (SR) 198 and several local roads. South Peach Avenue, East Clarkson Avenue, East Barrett Avenue, Elder Avenue, and South Tenth Avenue would be closed at the HST right-of-way, while the other roads would be realigned and/or grade-separated from the HST with overcrossings/undercrossings. Grade separations at Grangeville Boulevard, 13th Avenue, and

West Lacey Boulevard would be determined based on the alignment design option selected (at-grade or below-grade).

The potential Kings/Tulare Regional Station–West Alternative would be located along this alignment, east of Thirteenth Avenue between Lacey Boulevard and the SJVR railroad spur. This potential station includes an at-grade and below-grade design option as well.

The Hanford West Bypass 2 Alternative would be the same as the Hanford West Bypass 1 Alternative from East Kamm Avenue to just north of Jackson Avenue where the Hanford West Bypass 2 would curve away from the Hanford West Bypass 1 to the east. The Hanford West Bypass 2 Alternative would then travel over Kent Avenue, the BNSF Railway right-of-way, and Kansas Avenue on an elevated structure approximately 1.5 miles in length. The structure would reach a maximum height of 55 feet to the top of the rail before returning to grade north of Lansing Avenue and continuing along the BNSF Railway corridor. Similar to the Hanford West Bypass 1 Alternative, the Hanford West Bypass 2 Alternative would travel over Cross Creek and the special aquatic features located north of Corcoran and return to grade north of Nevada Avenue; however, the Hanford West Bypass 2 would be located on the eastern side of the BNSF Railway tracks in order to connect to either the Corcoran Elevated Alternative or the Corcoran Bypass Alternative, described below. Like the Hanford West Bypass 1 Alternative, the total length of the Hanford West Bypass 2 Alternative would be approximately 28 miles.

The Hanford West Bypass 2 Alternative includes the same below-grade design option between Grangeville Boulevard and Houston Avenue as the Hanford West Bypass 1 Alternative, as well as the either at-grade or below-grade potential Kings/Tulare Regional Station–West Alternative. Similar to the Hanford West Bypass 1 Alternative, Hanford West Bypass 2 would cross SR 198 and several local roads. Road closures would be the same as those for the Hanford West Bypass 1, and roadway modifications at Grangeville Boulevard, 13th Avenue, and West Lacey Boulevard would depend on the alignment design option selected.

3.2.1.3 Bakersfield Hybrid Alternative

From Rosedale Highway (SR 58) in Bakersfield, the Bakersfield Hybrid Alternative would follow the Bakersfield South Alternative and parallel the BNSF Alternative at varying distances to its north. At approximately A Street, the Bakersfield Hybrid Alternative would diverge from the Bakersfield South Alternative, cross over Chester Avenue and the BNSF right-of-way in a southeasterly direction, then curve back to the northeast to parallel the BNSF Railway tracks towards Kern Junction. After crossing Truxtun Avenue, the alignment would curve to the southeast to parallel the UPRR tracks to its terminus at Oswell Street. As with the BNSF and Bakersfield South alternatives, the Bakersfield Hybrid Alternative would begin at-grade and become elevated starting at Country Breeze Place through Bakersfield to Oswell Street. Dedicated wildlife crossing structures would not be required because this alternative would be elevated to the north and south of the Kern River.

The Bakersfield Hybrid Alternative would be approximately 12 miles long and would cross many of the same roads as the BNSF and Bakersfield South alternatives. This alternative includes the Bakersfield Station–Hybrid Alternative.

3.2.2 Station Alternatives

The additional alternatives to the Fresno to Bakersfield HST Section would include a new station in Hanford and a new station in Bakersfield.

Stations would be designed to address the purpose of the HST, particularly to allow for intercity travel and connection to local transit, airports, and highways. Stations would include the station platforms, a station building, and an associated access structure, as well as lengths of bypass tracks to accommodate local and express service at the stations. All stations would contain the following elements:

- Passenger boarding and alighting platforms.
- Station head house with ticketing, waiting areas, passenger amenities, vertical circulation, administration and employee areas, and baggage and freight-handling service.
- Vehicle parking (short-term and long-term) and "kiss and ride."[1]
- Motorcycle/scooter parking.
- Bicycle parking.
- Waiting areas and queuing space for taxis and shuttle buses.
- Pedestrian walkway connections.

3.2.2.1 Kings/Tulare Regional Station Alternative

The potential Kings/Tulare Regional Station–West Alternative would be located east of 13th Avenue and north of the San Joaquin Valley Railroad on the Hanford West Bypass 1 and 2 alternatives. The station would be located either at-grade or below-grade depending on which Hanford West Bypass alignment design option is chosen.

The at-grade Kings/Tulare Regional Station–West Alternative would include a station building of approximately 100,000 square feet with a maximum height of approximately 36 feet. The entire site would be approximately 48 acres, including 6 acres designated for the station, bus bays, short-term parking, and kiss-and-ride areas. Approximately 5 acres would support a surface parking lot with approximately 700 spaces. An additional 3.5 acres would support two parking structures with a combined parking capacity of 2,100 spaces.

The below-grade Kings/Tulare Regional Station–West Alternative would include a station building of approximately the same size and height. The below-grade station site would include the same components as the at-grade station option on the same number of acres; however, the station platform would be located below-grade instead of at ground level. Approximately 4 acres would support a surface parking lot with approximately 600 spaces and an additional 4 acres would support two parking structures with a combined parking capacity of 2,200 spaces.

3.2.2.2 Bakersfield Hybrid Station Alternative

The Bakersfield Station–Hybrid Alternative would be in the same area as the North and South Station alternatives, and located at the corner of Truxtun and Union Avenue/SR 204 on the Bakersfield Hybrid Alternative. The station design includes an approximately 57,000 square-foot main station building and an approximately 5,500 square-foot entry concourse located north of the BNSF Railway right-of-way. The station building would have two levels with a maximum height of approximately 95 feet. The first floor would house the concourse, and the platforms and guideway would be on the second floor. Additionally, a pedestrian overcrossing would connect the main station building to the north entry concourse across the BNSF right-of-way.

The entire site would be approximately 24 acres, with 15 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride areas. Approximately 4.5 of the 24 acres would support three parking structures with a total capacity of approximately 4,500 cars. Each parking structure would be seven levels; one with a planned capacity of 1,750 cars, another with a capacity of 1,315 cars, and the third with a planned capacity of 1,435 cars. An additional 460 parking spaces would be provided in surface lots covering a total of approximately 4.5 acres of the station site. Access to the station site would be from Truxtun and Union avenues, as well as

[1] "Kiss-and-ride" refers to the station area where riders may be dropped off or picked up before or after riding the HST.

from Hayden Court. Under this alternative, the BNSF Railway track runs through the station site, and the main station building and majority of station facilities would be sited south of the BNSF Railway right-of-way.

3.3 Area of Potential Effects Defined

Section 106 of the National Historic Preservation Act requires that an APE be defined for the project. An APE is defined in 36 CFR Part 800.16(d) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking; it may be different for different kinds of effects caused by the undertaking.

For the HST project, the APE presented in the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report* (Authority and FRA 2011b) for archaeological resources was established in consultation with project engineers and the Authority. On June 28, 2010, the California SHPO concurred with the approach defined below regarding the delineation of the APE, in accordance with the Section 106 Programmatic Agreement (Authority and FRA 2011d; Donaldson 2010). As with the ASR version of the APE, the archaeological APE for the sASR is defined as the project footprint, which is the area of horizontal and vertical ground disturbance expected during construction of the undertaking. Ground-disturbing activities include grading, cut and fill, easements, staging areas, utility relocations, and biological mitigation areas. All subsequent changes to the alignment have been related to its lateral position on the landscape or to the addition or removal of certain elements of the alignment. The overarching approach to defining the APE, however, did not change from the version approved by the SHPO, as defined above.

The archaeological APE reported in this sASR document reflects the most current configuration of the project alignments. As mentioned in Section 1.0, the APE had been modified due to project engineering changes to the project footprint since the ASR was submitted to the SHPO in October 2011. The modifications to the APE were made in a manner consistent with the parameters for delineation discussed above.

The majority of the alignment footprint changes represent minor changes from the October 2011 ASR configuration, in terms of the BNSF alignment, but the changes occur up and down the length of the alignment (see Appendix A). On the other hand, the Hanford West alignment alternative is a new addition to the set of alignment alternatives that was not included in the October 2011 ASR (see Appendix A).

3.3.1 Subsurface APE

As with the ASR, the current project description indicates that the subsurface disturbance expected for the majority of the project alignment would be to a depth of less than 6 feet. In urban settings, road crossings would be undergrounded to avoid at-grade crossings; however, the exact depths of these undercrossings are unknown at this time. The aerial structures constructed in many areas along the alignment would require piles that would be driven into the subsurface, in some cases 40 to 100 feet below grade. In these instances, the extent of disturbance would be limited to the diameter of the piles, which is currently unknown. Other elements of the project are also likely to result in subsurface disturbance, such as utility corridors, access roads, and laydown areas. The depths of disturbance associated with these elements are not presently known. As planning proceeds, these definitions will be added to the overall APE description.

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Chapter 4.0
Summary of Identification Effort

4.0 Summary of Identification Effort

The details regarding the approach to the identification effort are presented in the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report* (Authority and FRA 2011b). The following section describes the efforts to update previous work and to identify cultural resources and provide context for any newly identified resource within the revised APE.

4.1 Archival Review and Research

This section describes the background literature review, the records search, the survey methods and implementation, the framework for identifying archaeological properties, and the communications with Native Americans.

4.1.1 Background Literature Review

An additional review of relevant literature and sources on San Joaquin Valley prehistory, ethnography, and history was undertaken to develop a broad context of the cultural evolution and archaeological record for the newly added project area. In addition, literature related to the natural and physiographic setting was reviewed as it pertained to the changes in the APE. This research involved library database searches, reviews of texts such as *California Archaeology* (Moratto 1984) and *California Prehistory: Colonization, Culture, and Complexity* (Rondeau et al. 2007), and archaeological reports more directly relevant to the southern San Joaquin Valley.

The geoarchaeological sensitivity assessment (Section 5.2.5) is based on a review of the inventory, compilation, and analysis of existing data on the geomorphology, sedimentology, pedology, and hydrology conducted for the purposes of the ASR. Refer to the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report* (Authority and FRA 2011b) for the details of this analysis.

Many of these existing data were recently compiled and synthesized in *A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9* (Meyer et al. 2009), which encompasses the entire California HST Fresno to Bakersfield project area and which deals with the problem of buried archaeological sites on a landscape scale directly relevant to the scale of the California HST project. Rather than attempt to duplicate the immense amount of time and effort, including original field studies, that went into creating the district-wide assessment, the California Department of Transportation (Caltrans) report is discussed and summarized in Section 5.2.4 with reference to the California HST archaeological APE, along with additional research and specificity where necessary.

4.1.2 Records Search

In the fall of 2009, URS Corporation (URS) performed a digital scan of the Southern San Joaquin Valley Information Center (SSJVIC) Resource and Reports U.S. Geological Survey (USGS) 7.5-minute quadrangles that intersect with the Fresno to Bakersfield Section. Each quad was geo-referenced to real-world coordinates and placed in a geographic information system (GIS) environment to allow for accurate digitization of the individual resources and reports recorded on the maps. In March 2011, each quadrangle used in the original records search was updated to ascertain whether any newly identified resources have been submitted to the SSJVIC since September 2009, when the quadrangles were originally scanned. The results of this update are incorporated into the results below. URS reviewed the digital quadrangles for resources and the survey reports of the newly added project area.

The following references were also reviewed:

- National Register of Historic Places – Listed Properties and Determined Eligible Properties.
- Directory of Properties in the Historic Property Data File for Fresno, Kings, Tulare, and Kern Counties (OHP 2009).
- *California Inventory of Historic Resources* (OHP 1976).
- *California Points of Historical Interest* (OHP 1992).
- *California Historical Landmarks* (OHP 1995).
- *Handbook of North American Indians*, Volume 8, California (Heizer 1978).
- Sanborn Maps in urban areas.
- Historic USGS quadrangles.
- Local General Plan Documents for Fresno, Kings, Tulare, and Kern counties.

The results of the records search are discussed in Section 6.1 (see also Appendix B).

4.2 Survey Methods

This section describes the field identification efforts conducted for the Fresno to Bakersfield Section of the California HST archaeological surveys, following the guidance set forth in the Section 106 PA (Authority and FRA 2011d). This section also discusses the parameters for exempting certain properties according to the guidance set forth in the Section 106 PA (Authority and FRA 2011d).

4.2.1 Survey Implementation

The principal constraint on the pedestrian survey was obtaining entry to private parcels of land that intersect with the APE. Prior to the survey, a third-party, right-of-way consultant, Bender Rosenthal, Inc., conducted a project-wide effort to secure permission to enter (PTE) privately held land. Lists of parcels for which PTE had been obtained, as well as any special conditions to access, were provided to URS by the Bender Rosenthal team. These lists were then integrated into both field mapping and global positioning system (GPS) units to provide field staff spatial information regarding where the survey was authorized. In many cases access was not granted. Those parcel owners who granted access for the surveying of the additional project area represented approximately 39% of the project footprint acreage (i.e., the APE). The remaining parcel owners either did not respond or did not grant access to their land.[2] Section 6.3 discusses the area that was subjected to the pedestrian survey relative to the total area within the APE.

Given differences in ground surface visibility across the APE, mainly due to factors such as vegetation cover or urban development (paving, etc.), field survey methods varied. The paramount objective was to perform the field survey efficiently, while maximizing the opportunity for observation of archaeological manifestations. In every instance, however, the actual field circumstances dictated the most appropriate survey technique that balanced efficiency and the potential for detecting archaeological phenomena (Banning et al. 2006). Every effort was taken to survey 100% of the accessible APE; however, as discussed below, there were exceptions in areas that were deemed unsafe or where visibility of the surface was minimal or nonexistent and precluded the discovery of cultural resources. These included areas of dense underbrush, stands of poison oak, heavy agricultural cover, areas recently dusted with pesticides, concentrated feeding operations, and areas that were paved or under water.

[2] In some instances, Bender Rosenthal, at the behest of the Authority, did not notify or request access to certain parcels along the project footprint because the parcel contained negligible acreage within the footprint or represented a heavy industrial facility.

The urbanized segments of the Fresno to Bakersfield Section were surveyed using a combination of techniques depending on the nature of the field condition. In some instances, areas of exposed ground within an otherwise heavily urbanized area were closely inspected. However, by and large, the urbanized areas provided little visibility with respect to surface manifestations of archaeological deposits, and pedestrian surveys were therefore not conducted.

To address the possibility of buried historic-era cultural deposits in urbanized settings, URS obtained a set of fire insurance maps (Sanborn Maps) for the historically urbanized areas that intersect with the project alignment. The map set, which has been fully georeferenced, serves as a digital map tool (EDR 2010). The map set was reviewed to determine the sensitivity/potential for buried historic-era deposits within the project footprint.

In areas under active cultivation, survey transects followed the direction of the rows, if feasible. A zigzagging approach was employed in areas where rows were planted obliquely to the direction of the APE. In general, planted and fallow agricultural fields were surveyed at 10- to 15-meter (33- to 49-foot) transect intervals. As discussed above, this was sometimes not feasible due to adverse conditions or variability in ground surface visibility. In these cases, the survey method that maximized ground surface inspection was employed.

Within the BNSF Railway right-of-way (which is considered 50 feet on either side of the track centerline) and other rail right-of-ways, the degree of disturbance within portions of the right-of-way precluded an examination of the native surface, and hence these areas were not surveyed as intensely as areas of open land. These heavily disturbed portions of the existing rail rights-of-way include the rail prism and ballast where the potential for archaeological deposits is assumed to be low enough not to warrant unnecessarily narrow transects. As discussed in the *California High-Speed Train Fresno to Bakersfield Archaeological Inventory and Evaluation Plan* (Authority and FRA 2011a), substantial historic-era archaeological deposits were assumed not to exist within the rail right-of-way, given that habitations or activities producing either surface manifestations or buried features, other than evidence of original construction, were unlikely to exist in these areas.

4.2.2 Framework for Identifying Archaeological Properties

The field procedures that guided the identification of archaeological sites relied on the *California High-Speed Train Fresno to Bakersfield Archaeological Identification and Evaluation Plan* (Authority and FRA 2011a) and the Section 106 PA (Authority and FRA 2011a), as well as the standards of professional practice of archaeology. The following served as the overarching approach to resources encountered in the field for the purposes of the Fresno to Bakersfield Section and also served as the guidance for establishing historical property exemptions, the criteria for what constitutes an "isolate" and a "site," and the process for the initial evaluation of a given resource (Authority and FRA 2011d).

Archaeological Properties (Prehistoric and Historic) Exempt from Evaluation

The following properties are exempt from evaluation, as specified in the Section 106 PA, Attachment D, based on the professional judgment of Qualified Investigators qualified in the area of archaeology (Authority and FRA 2011d: D-1):

- Isolated prehistoric finds consisting of fewer than three items per 100 square meters (1,076 square feet).
- Isolated historic finds consisting of fewer than three artifacts per 100 square meters (1,076 square feet) (e.g., several fragments from a single glass bottle are one artifact).

- Refuse scatters less than 50 years old (scatters containing no material that can be dated with certainty as older than 50 years old).
- Features less than 50 years old (those known to be less than 50 years old through map research, inscribed dates, etc.).
- Isolated refuse dumps and scatters over 50 years old that lack specific associations.
- Isolated mining prospect pits.
- Placer mining features with no associated structural remains or archaeological deposits.
- Foundations and mapped locations of buildings or structures more than 50 years old with few or no associated artifacts or eco-facts and with no potential for subsurface archaeological deposits.
- Building and structural ruins and foundations less than 50 years old.

Qualified Investigators in California archaeology applied professional judgment as to the level of identification effort. This exemption process does not include archaeological sites, traditional cultural properties, or other cultural remains or features that may qualify as contributing elements of districts or landscapes. The lead archaeological surveyor was authorized to exempt these archaeological property types and features. Sites or deposits exempted were documented in the field and were retained as field notes.

In all other cases, the survey crews sought to identify historic properties that exist in the archaeological APE in accordance with 36 CFR Part 800.4(a)(2-4) and 36 CFR Part 800.4(b). This process followed the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44716), and was consistent with the SHPO's guidance and other guidance, methods, agreements, or protocols that the FRA, Caltrans, the Authority, and SHPO agreed should be used to identify historic properties.

In addition to the above methods, all identified archaeological sites or concentrations were entered into an overall database of properties using a GPS-enabled handheld device. The entire database was designed to link photos, coordinates, and records to each property identified.

4.2.3 Native American Communication

The FRA and Authority, adhering to the requirements of the Section 106 PA, continue to consult with Native Americans who have expressed interest in the California HST. Tribes that are currently consulting with the FRA and Authority for the Merced to Fresno Section of the HST and that have expressed interest in the Fresno to Bakersfield Section are the Santa Rosa Rancheria Tachi Tribe (Lalo Franco) and Eshom Valley Band of Indians (Ken Woodrow). The Santa Rosa Rancheria Tachi Tribe indicated they were interested in consultations with the FRA and Authority for the Fresno to Bakersfield Section in a meeting on April 17, 2012. The Eshom Valley Band of Indians expressed interest in consultations during an email exchange and follow-up phone call between Ken Woodrow and the Authority on January 10 and January 11, 2012. Mr. Woodrow's primary concern pertains to the treatment and disposition of human remains, if they are encountered in the project area. He is also interested in entering into a confidentiality agreement for resources that he is aware of that are currently not documented. Mr. Woodrow does not want the locations of sites he reveals to be divulged to other tribes, to the public, or to information centers. The Authority asked to discuss this when they meet with the Eshom Valley Band of Indians. The FRA and Authority are expected to continue these consultations through the completion of the Section 106 process.

Adhering to the requirements of the Section 106 PA for the California HST, the FRA and the Authority have initiated consultation with the Native American Heritage Commission for purposes of conducting a search of its Sacred Lands File and obtaining lists of Native American contacts. Given the changes to the project alignment since the original Sacred Lands File request was submitted, the FRA and the Authority initiated consultation with these contacts by letter on June 22, 2012. Those contacted were provided with information about the proposed project alternatives, and they were asked to supply information about any traditional cultural properties that could be affected by the project. The FRA and Authority are expected to continue consultation with these contacts through the completion of the Section 106 process.

4.2.4 Local Agency Communication

URS initiated communication with the City of Fresno after comments from the general public were made in response to the *Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the Proposed California High-Speed Train System* (Authority and FRA 2011c) regarding concerns over the alleged "tunnels" in Fresno's Chinatown neighborhood. Documentation of previous studies of the area was provided to URS for analysis, and further research, including a review of Sanborn Maps of downtown Fresno, was conducted. A review of the maps and relevant literature and the results of the research are discussed in Section 6.2.

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Chapter 5.0

Historic and Geomorphic Setting

5.0 Historic and Geomorphic Setting

This chapter describes the environmental and cultural setting for the area that represents the Hanford West Bypass area (see Figure 1-1). The remaining geographic area that represents the majority of the project, including the revised BNSF Alternative and the Bakersfield Hybrid Alternative, has already been addressed in the *California High-Speed Train Fresno to Bakersfield Archaeological Survey Report* (Authority and FRA 2011b). In addition, the analysis of the geoarchaeological potential for the entire project area is covered in the ASR. The following provides a brief discussion for the purposes of addressing the geoarchaeological forecasts for the Hanford West Bypass.

5.1.1 Natural Setting

The study area for the Hanford West Bypass area and the corresponding area of the BNSF Alternative is at the southern end of California's San Joaquin Valley. The San Joaquin Valley is bounded by the Sacramento–San Joaquin River Delta to the north, the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the Coast Range to the west. The western slope of the Sierra Nevada is the source for rivers and streams that cross the San Joaquin Valley (Gronberg et al. 1998). The San Joaquin Valley is divided into two hydrologic sub-basins: the San Joaquin sub-basin to the north and the Tulare sub-basin to the south. Rivers of the San Joaquin sub-basin join the San Joaquin River as it drains into the Sacramento River and flows into San Francisco Bay. The rivers of the Tulare sub-basin, from the Kings River south, have no natural perennial surface outlet, and in the past these drainages formed large, shallow, semi-permanent inland lakes. Only in years of exceptional rainfall did water cross the divide and enter the San Joaquin sub-basin.

During the Pleistocene era, alluvial fans of the Kings River and Los Gatos Creek formed a ridge that impounded waters to the south of the ridge and formed the Tulare Lake basin. As late as the 1840s, Tulare Lake measured 44 by 22 miles in diameter at high water and covered an area of 760 square miles (Gifford and Schenck 1926:7–8; Miller 1957:171–172). The other major lakes within the basin were Buena Vista and Kern lakes.

At low water levels, Tulare and Buena Vista lakes were historically separated by a slough, but at higher water levels they were connected into one lake. Buena Vista Slough connected the basins of Buena Vista Lake, Kern Lake, and Tulare Lake (Gifford and Schenck 1926:11). The slough extended from Tulare Lake for 40 miles to Buena Vista Lake. The northern 35 miles of the slough had an average width of 2 to 5 miles, while the lower 5 miles were 80 to 100 feet wide. Generally, the slough followed the western margins of the southern San Joaquin Valley and the eastern base of the South Coast Range foothills, and the swampy areas spread out to the east into the valley floor (Gifford and Schenck 1926:11).

5.2 Geomorphic Setting and Geoarchaeological Assessment

The central area and eastern side of the San Joaquin Valley are dominated by a complex intermingling of basin deposits that dominate the valley floor and by large alluvial fans that issue from the foothills of the Sierra Nevada and extend across the valley. This geomorphic contact is a geologically and seismically active area, and this activity has had a direct effect on the surface geomorphology, deposition, and soils.

The San Joaquin Valley is a deep structural trough that was a large marine embayment (i.e., open to the ocean) during much of its geologic history. The trough became progressively closed off during Pliocene times (ca. 5 million years ago) as a result of the uplift and movement along the San Andreas fault zone, causing a transition from a marine to terrestrial depositional environment. This trend continued until the Pleistocene, when the valley was finally completely closed off from its outlet through Priest Valley (near Coalinga) and alluvial fan deposits like the Tulare Formation and Kern River Formation (see below) completed the infilling of the valley. Episodic alluvial sedimentation in the San Joaquin Valley throughout the Quaternary probably has been controlled more by climatic fluctuations than by tectonic activity, though both have played a role (Bartow 1991:7–9).

5.2.1 Project Area Soils and Geoarchaeology

Through correlation of mapped surface soil units, field observations, soil profile descriptions, and radiocarbon dates—compiled from existing studies as well as from original fieldwork conducted for Caltrans—Meyer et al. (2009) established a relational database of mapped soil series and landform age for the southern San Joaquin Valley. Their study is largely based on soils data obtained through the Soil Survey Geographic Database, which is a digital duplication of various original Soil Conservation Service soil survey maps. A re-creation of this landform age map, based on the published soil-age database (Meyer et al. 2009), is included here in Figure 5-1.

The database is predicated on the theory that specific soils types are typically associated with specific depositional environments and landforms of a particular age. The degrees of soil profile development provided by official soil series descriptions were used to make initial relative-age estimates. In addition to relative soil development, age estimates were also based on the geomorphic position of associated landforms, crosscutting relationships, degree and extent of erosional dissection, radiocarbon dates, and correlations with other dated deposits (Rosenthal and Meyer 2004:76).

In cases where there was disagreement on landform age assignments between soil surveys and/or other geomorphic studies, a combination of soil profile development, horizontal crosscutting relationships, and radiocarbon dating was used to place similar soil series and landforms into particular temporal groups. This cross-comparison effort eventually resulted in Soil Survey Geographic Database soil map units that were consistently associated with landforms that occupy similar geomorphic positions on the landscape. These units could then be grouped into major temporal periods that could be assigned a relative sensitivity for buried archaeological resources. (For a complete description of methodology used to create the soil-age database, see Meyer et al. 2009:3, 123-128).

The Meyer et al. (2009) database and the relative acreages of a particular level of sensitivity was calculated in GIS to determine the amount of acres (or generally the amount of area) of a given sensitivity within each of the alignment alternatives' APE. The results are presented in Table 5-1. The relative levels of sensitivity were ranked by Meyer et al. (2009) using a weights of evidence analysis. For example, areas with surface slopes of 10 degrees or less, which are near water and associated with late Holocene surface deposits, were calculated by adding the slope and distance to water score of 2 to the latest Holocene score of 4, for an overall score of 6, or Very High. On the other hand, to calculate the score for areas with surface slopes greater than 10 degrees that are not near water and are associated with pre-Quaternary surface deposits, the slope and distance to water score of -2 was added to the pre-Quaternary score of -1 for an overall score of -3, or Very Low. As indicated in Table 5-2, it appears that the Hanford West alternatives have a "very high" sensitivity for just over half of the area, whereas the Corcoran Bypass Alternative exhibits a "very high" rating for more than 90% of the area.

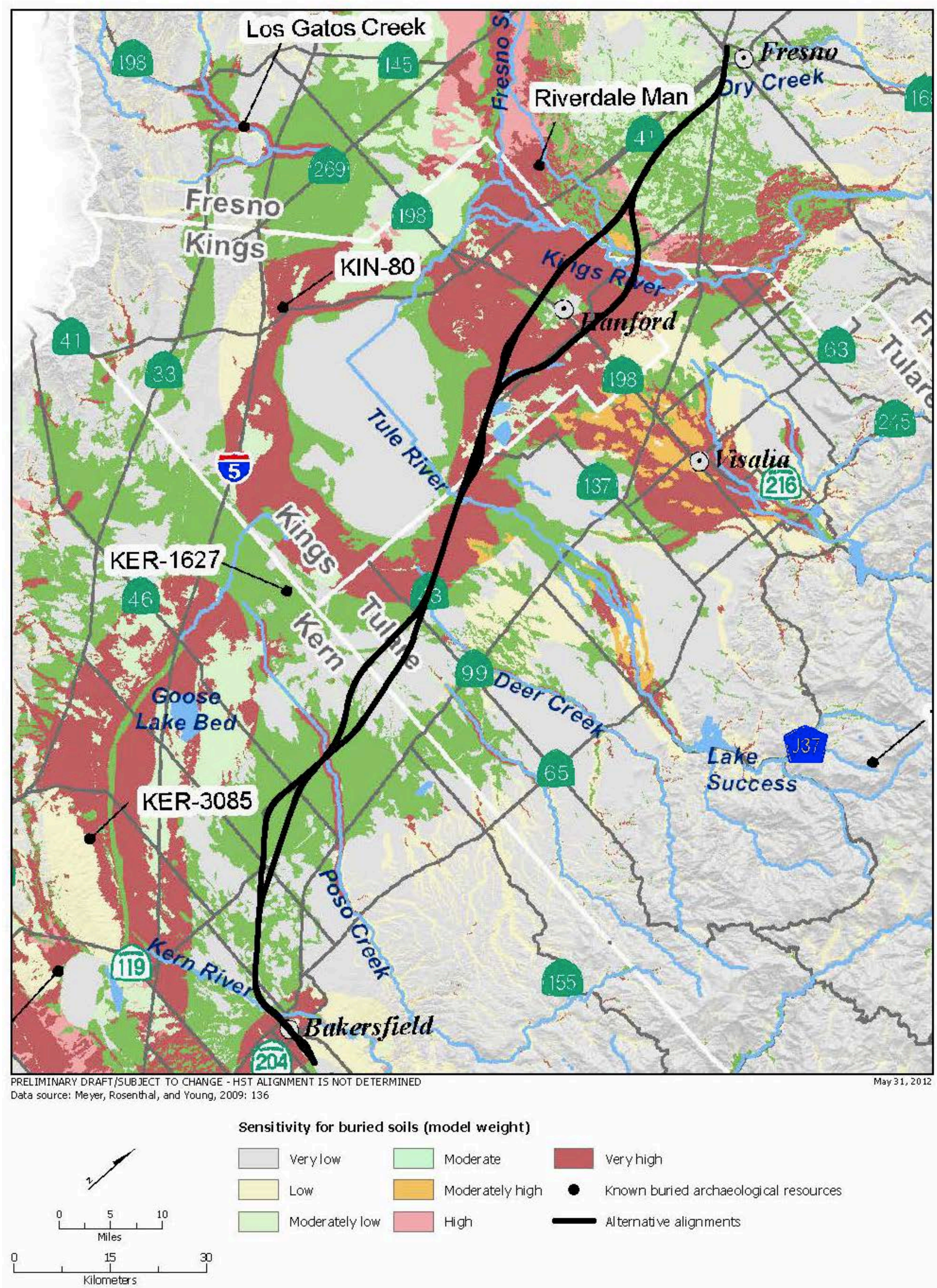

Figure 5-1
Geoarchaeological sensitivity

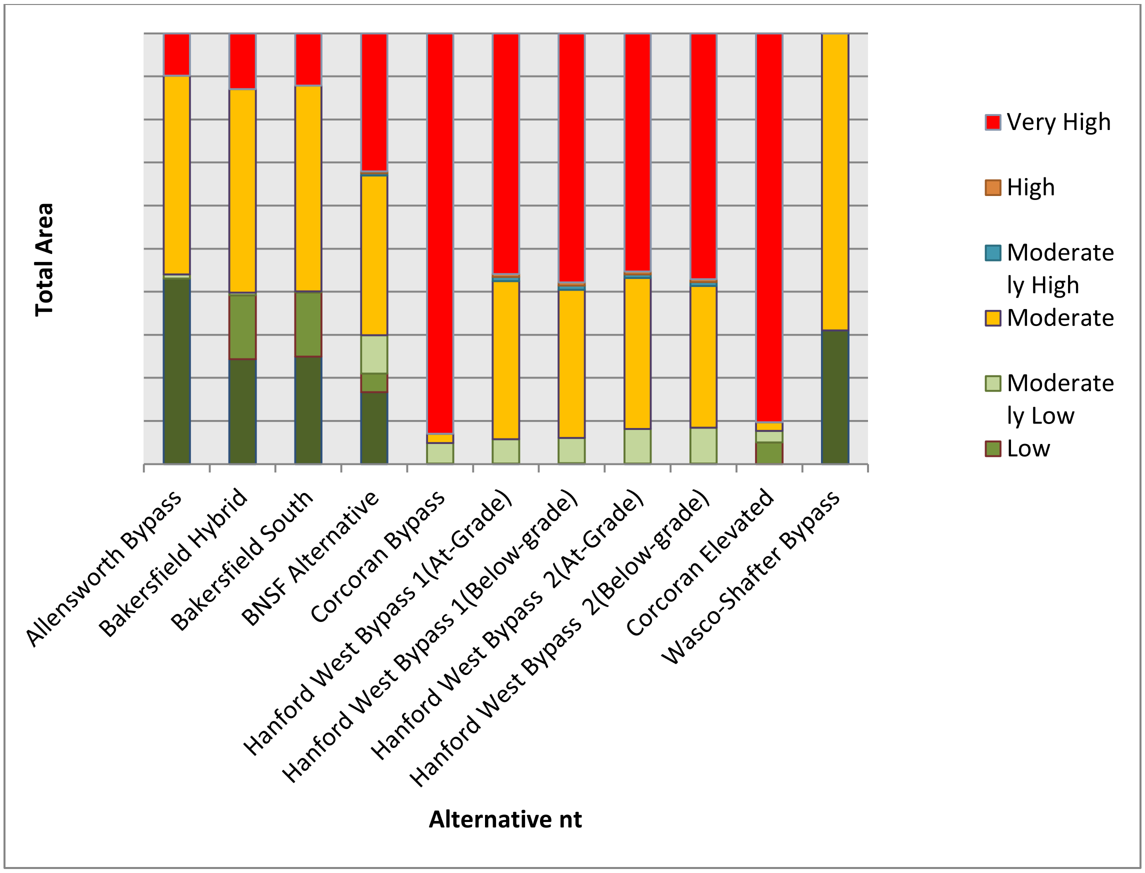

Figure 5-2
Geoarchaeological sensitivity by alternative (proportion of area)

5.3 Cultural Setting

5.3.1 Prehistoric Setting

A long history of archaeological research in the southern San Joaquin Valley informs the present understanding of the prehistory of the region. Much of the early research was focused on the material remains of the late prehistoric and ethnographic periods. In the last decade of the nineteenth century, professional and amateur archaeologists began investigating the numerous "Indian mounds" of the region. C.H. Merriam collected a large coiled basket that contained the mummified body of a child from within a rock shelter near Bakersfield (Heizer 1951:30). Other materials collected by Merriam from the rock shelter included another basket, a net manufactured from the fibers of the milkweed, hemp cordage, portions of a rush mat, and fragments of a rabbit-skin blanket. In February 1909, N.C. Nelson of the University of California Archaeological Survey recovered a cache of baskets and other artifacts from a dry arroyo in the Elk Hills (Moratto 1984:174).

In 1899, 1909, 1923, 1924, and 1925, test excavations took place at more than 20 different sites around [redacted], all focusing on the recovery of burials and grave goods from large village sites (Gifford and Schenck 1926; Hartzell 1992:122). Gifford and Schenck, of the University of California, published their volume on the archaeology of the southern San Joaquin Valley in 1926. The report included the documentation of approximately 40 sites, the results of their excavation of 9 sites, and the examination of private collections. They concluded that the only discernible change in or addition to the culture of the southern San

Joaquin Valley is represented by steatite in the "slough and lake regions" (Gifford and Schenck 1926:118). This apparent lack of change in material culture resulted in their claim that the cultural remains recovered seemed to be as readily assignable to the "last century as to the last millennium" (Gifford and Schenck 1926:118). These early assumptions regarding the lack of change over time in the archaeological record were, in part, the result of poor dating techniques as well as sampling bias resulting from over-dependence on large, highly visible recent archaeological sites that dominate surface contexts in the region. (See the geoarchaeological discussion in the ASR.)

This work was followed in the 1930s through 1960s by limited excavations in the southern San Joaquin Valley, [redacted], by various researchers, including the Smithsonian Institute, Wedel, von Werlhof, Warren, and Fredrickson; these excavations also focused on larger village and burial sites (Schiffman and Garfinkel 1981:3-4). During the Depression years of 1933 and 1934, the Civil Works Administration excavated five sites (two middens, two cemeteries, and a small grave site) next to the southwestern shore of Buena Vista Lake. The midden sites, CA-KER-39 and CA-KER-60, exhibited stratified deposits that represented both prehistoric and protohistoric/ethnographic occupations. Materials recovered from the two cemeteries, CA-KER-40 and CA-KER-41, appeared contemporaneous with materials from the upper deposits of CA-KER-39 and CA-KER-60, suggesting that they may have been the burial grounds for the inhabitants of the midden sites. Reported upon by Wedel (1941), this investigation stands as the "most intensive scientific excavation work so far in the southern San Joaquin Valley" (Moratto 1984:188).

CA-KER-39 and CA-KER-40 were subsequently found to be components of a much larger site, CA-KER-116. Excavated in the mid-1960s by Fredrickson and Grossman (1977), CA-KER-116 was found to contain a deeply buried component that was not identified by Wedel. Situated at depths of greater than 2.8 meters (9.2 feet), this component was dated to circa 6250 B.C. (Moratto 1984:99, 188).

From an archaeological perspective, research conducted within the southern San Joaquin Valley has resulted in the identification and definition of a number of temporal components, periods, or phases that reflect prehistoric human lifeways and land use patterns. This research has predominately focused on sites situated along the ancient shoreline of [redacted] (Fredrickson and Grossman 1977; Gifford and Schenck 1926; Hartzell 1992; Riddell 1951; Walker 1947; Wedel 1941) and in the [redacted] (Angel 1966; Hewes 1941; Siefkin 1999). As shown in Figure 5-3, the early comprehensive surveys of the San Joaquin Valley revealed clusters of sites in areas near wetland, river, or lacustrine resources.

Wedel's (1941) investigations resulted in the definition of a general chronological framework based on stratigraphic analyses and comparison of artifact assemblages. A two-phase sequence, composed of a pre-European late occupation and an earlier cultural complex, was proposed (Wedel 1941). The early complex was correlated to the Oak Grove Culture of the Santa Barbara Coast, dated alternately at 2,000 to 4,000 years ago (Meighan 1955) and 4,000 to 7,000 years ago (Heizer 1964). The late complex was clearly separated from the earlier one by both stratigraphy and artifact types. Wedel (1941) subdivided the late complex into two phases: the early late phase and the later protohistoric period. Wedel suggested that the early late phase began about A.D. 1400, and that it reflected a simple culture complex with similarities to the Tulare Basin to the north. The later protohistoric period, dating to after A.D. 1500, revealed a strong influence from Santa Barbara coastal cultures.

Additional investigations were conducted in the mid-1960s along the [redacted] at CA-KER-116 (Fredrickson and Grossman 1977), a small part of an extensive occupation zone that parallels the shoreline for about 2 miles (Fredrickson 1986). Incorporating data from both Wedel's (1941) study and his own work from the 1960s, Fredrickson (1986) has since proposed a four-phase cultural sequence for the Buena Vista Lake area.

The earliest occupation is represented by a meager inventory of distinctive artifacts, which include a ground stone atlatl spur, three crescents, and fragments of several crude, leaf-shaped projectile points (Fredrickson 1986). Radiocarbon age determinations provided three dates of suggested cultural association: two dates were 6250 B.C., and the third was 5650 B.C. (Fredrickson 1986; Fredrickson and Grossman 1977). Fredrickson (1986) notes that while similar style artifacts were recovered from Paleo-Indian period contexts at [redacted] (Riddell and Olsen 1969), similar conclusions regarding such antiquity at CA-KER-116 should not be made in the absence of corroborative stratigraphic data.

The ensuing phase is represented by sparse remains that reflect an early milling stone assemblage with a possible cultural relationship to the Oak Grove and other milling stone complexes of Southern California (Fredrickson 1986). Hallmark attributes include handstones, milling stones, flake scrapers, and extended burial posture. This phase remains undated, but inferences may be drawn from the milling stone horizon elsewhere in Southern California, which began as early as 5000 B.C. and persisted for 3,000 years or more (Fredrickson 1986).

The next cultural phase, the late period (ca. A.D. 900 to A.D. 1500), is separated from the milling stone complex by millennia, as no assemblage has been found along the southwestern lakeshore to fill in the presumed occupational gap (Fredrickson 1986). Based on stylistic and technological differences in artifact forms, Fredrickson (1986) has tentatively divided the late phase into two subphases: the earlier subphase and the later subphase. The earlier subphase is distinguished by split-punched and whole spire-lopped *Olivella* beads and crudely made leaf-shaped points. The later subphase is defined by more finished and rough disk *Olivella* beads and by a local bead-making industry, which may have used rare whole-shell *Olivella* (Fredrickson 1986). Small quantities of asphaltum[3] are noted, as are hopper mortars, and clay-lined roasting ovens filled with freshwater clamshell; steatite is rare.

REDACTED FROM THIS VERSION

Figure 5-3
San Joaquin Valley archaeological site distribution (after Hewes 1941)

The final period at [redacted] is considered to represent the ancestral Yokuts' continuous use of the lakeshore environment. This protohistoric period, dating perhaps from A.D. 1500 to the ethnographic period, is represented by abundant use of asphaltum and steatite, the presence of baked-clay objects, triangular projectile points, an elaborate bone technology, bowl hopper mortar, disk *Olivella* beads, *Haliotis* beads and ornaments, marine clam-shell disk beads, and small pendants and carvings of steatite (Fredrickson 1986).

Recent archaeological research conducted by Hartzell (1992) at sites along the southwestern margin of [redacted] (Wedel Site #1 and #2; CA-KER-116) and near [redacted] (CA-KER-180 and CA-KER-1611) has resulted in the refinement of the lakeshore's chronological sequence as it relates to the Holocene epoch. A similar approach was taken by Siefkin and colleagues (Siefkin et al. 1996) for the neighboring [redacted]. Cumulatively, these studies provide definition of three broad temporal periods for the larger southern San Joaquin Valley area: (1) Early Holocene [12,000 to 7,000 B.P.; 10,000 to 5000 B.C.], (2) Middle Holocene [7000 to 4000 B.P.; 5000 to 2000 B.C.], and (3) Late Holocene [4000 to 150 B.P.; 2000 B.C. to A.D. 1850]. (See the Prehistoric Setting, Sections 1.1.1 through 1.1.3 in the ASR for more information.)

[3] A naturally occurring tar used as a binding agent.

5.3.2 Ethnographic Setting

The southern San Joaquin Valley is in the homeland of the Southern Valley Yokuts (Wallace 1978:448, 449), a geographic division of the much larger Yokuts linguistic group who occupied the entire San Joaquin Valley and adjoining Sierra Nevada foothills (Kroeber 1907, 1925, 1963; Latta 1949; Newman 1944). Yokutsan is one of four Penutian linguistic stocks, which included Costanoan (Ohlonean); Miwok (Utian); Wintu, Nomlaki, and Patwin (Wintuan); and Maidu, Nisenan, and Konkow (Maiduan) (Shipley 1978).

In contrast to the typical California cultural grouping known as the tribelet, the Yokuts were organized into "true tribes" in that each had "a name, a dialect, and a territory" (Heizer 1971: 370). Kroeber (1925:474) estimated that as many as 50 Yokuts tribes may have originally existed, but that only 40 were "sufficiently known to be locatable" at the time of his survey. Each tribe inhabited an area averaging "perhaps 300 square miles," or about the distance one could walk in any direction in half a day from the center of the territory. Some Yokuts tribes only inhabited a single village, while others occupied several (Kroeber 1925: 474–475).

The Southern Valley Yokuts territory was centered near the basins of Tulare, Buena Vista, and Kern lakes, their connecting sloughs, and the lower portions of Kings, Kaweah, Tule, and Kern rivers. Sixteen subgroups, each speaking a different dialect of the Yokuts language, made up the Southern Valley Yokuts; the Nutunutu was the dialect in the vicinity of Hanford and recently revised areas of the APE. The Nutunutu inhabited the swampy area north of Tulare Lake, south of Kings River.

Subsistence strategies focused on fishing, hunting waterfowl, and collecting shellfish, seeds, and roots. Fish species commonly hunted included lake trout, chubs, perch, steelhead, salmon, and sturgeon. Waterfowl were mainly caught in snares and nets. Plant foods played a key part in the Yokuts diet; the most important resource was tule, whose roots and seeds were eaten. Other plant foods included various species of grasses, clover, fiddleneck, and alfilaria. Acorns were not readily available, and groups often journeyed into foothill zones to trade for the nut (Wallace 1978:450).

Southern Valley Yokuts generally placed their settlements on top of low mounds near major watercourses and constructed two types of permanent residences. The first was an oval, single-family dwelling with wooden framing covered by tule mats. The second type was a long, steep-roofed communal residence that housed at least 10 families. Other structures included granaries and a communally owned sweathouse (Wallace 1978:450, 451).

Southern Valley Yokuts relied heavily on tule reeds for making woven baskets and mats. Basketry tools such as awls were manufactured from bone (Wallace 1978:451, 452). Flaked stone implements included projectile points, bifacial and unifacial tools, and edge-modified pieces. Ground stone tools consisted of mortars, pestles, handstones, and millingstones.

5.3.3 Historic Setting

Spanish exploration of the San Joaquin Valley did not occur until 1806 when Spanish explorer Gabriel Moraga and Father Pedro Muñoz led a party of 25 soldiers from Mission San Juan Bautista into present-day Fresno County. In 1808, Moraga led a second party through the San Joaquin Valley in search of suitable Franciscan mission sites. However, permanent settlement of the region was delayed until after the Mexican Independence of 1822. As a way to encourage settlement, the Mexican government between 1833 and 1846 granted large tracts of lands to prominent citizens for ranching. In Fresno and Kings counties, two land grants, *Pancha Grande* and *Laguna de Tache*, were established; *Laguna de Tache* was renamed *Rancho del Rio San*

Joaquin, which was accepted by the U.S. Land Commission in 1866 (Cowan 1977; Hiigel 2008:104).

Cattle had been raised during the Mexican Period primarily for the hide and tallow trade, as there was no market for large quantities of beef. However, with the discovery of gold at Sutter's Mill near Coloma in 1848, thousands of prospectors and other fortune seekers flocked to California, and the need for meat and other food sources soared. After several years, the easy placer gold was played out; placer mining made way for hydraulic mining, which required a heavy investment in equipment in addition to the already required investment of labor. It was then that many "49ers" became disillusioned and reverted to farming and ranching.

After California became a state in 1850, cattle ranching was the primary activity in the San Joaquin Valley. However, torrential rains that resulted in horrendous flooding, followed by severe droughts between 1862 and 1877, brought unanticipated cattle losses throughout the region (Pulling 1965). Due to this hardship, the new state laws requiring ranchers to fence in their livestock, and the coming of the railroad in 1872, cultivation crops became the principal economic interest in the San Joaquin Valley Hoover et al. 2002:94). The rich fertile lands of the San Joaquin Valley provided an ideal location for dry farming wheat. Wheat was a perfect crop for California: it required little to no irrigation, benefited from the dry summers, and could be transported profitably to distant markets via sailing ships (Rice, Bullough, and Orsi 1996:281). Growers hauled wheat in wagons to railroad platforms where long trains converged on San Francisco Bay and transported the non-perishable crop via ship to China, Australia, and the British Isles (Rice, Bullough, and Orsi 1996:282). The wheat boom of the 1870s gave way to an overproduction of wheat, making the grain only a minor crop in California by 1890.

The successful production of wheat, sold in a global market, resulted in the most mechanized and structured form of agriculture in the world. Despite the overproduction of wheat, the system was in place in California's Central Valley for continued agricultural dominance and for switching to specialty crops such as grapes, citrus, cotton, and rice. The one limiting factor was a year-round supply of water. Intensive agriculture in the arid San Joaquin Valley would not be possible without regulating the limited water sources to provide a more consistent supply (Hoover et al. 2002:94; Igler 2001:34). Successful ranchers and farmers in the valley were those who sought protection from nature's unpredictability and who supported the development of irrigation canals.

In 1870 only 60,000 acres, a small fraction of California's cultivated land, was being irrigated (Rice, Bullough, and Orsi 1996:288). The acreage increased to nearly 400,000 acres by 1880 (JRP Historical Consulting 2000:12). Fresno County alone had canals that irrigated over 600,000 acres of land by 1887 (Hoover et al. 2002:95). Private organizations—commercial irrigation companies, land colonies, and mutual water companies—led the water development projects in the 1860s, 1870s, and early 1880s. By the late 1880s, public entities (including irrigation districts, county water districts, and later, water storage districts) assumed a greater role in designing, building, and administering irrigation systems in the San Joaquin Valley (Adams 1929:204; Harding 1960:83–90; JRP Historical Consulting Services 2000:19–24).

The early resourcefulness in securing water for private and public purposes that was refined during the late 1800s was expanded on a grander scale by the mid-twentieth century with the Central Valley Project (CVP). Operating in Fresno, Tulare, and Kings counties, the CVP was approved in the 1920s and implemented in October 1937 as a joint Bureau of Reclamation and U.S. Army Corps of Engineers federal water project that built dams, hydropower plants, and canals (Beck and Haase 1974:77; Hundley 2001:253). The Friant-Kern Canal (1945-1951) was a CVP project that carried water over 150 miles south from Millerton Lake in San Joaquin County to the Kern River, 4 miles west of Bakersfield. Previously constructed canals were enlarged to accommodate the CVP water supply. Most of the post-World War II irrigation projects brought water to the Central Valley on a large scale, encouraging agricultural development and other manufacturing industries such as cotton production and sugar beet refining (JRP Historical Consulting 2000). Today, the water collected irrigates hundreds of miles of crops in the Central Valley and beyond.

Besides the distribution of water, railroads were instrumental in the settlement and economic development of the Central Valley. The first railroad to invest in the valley was the Central Pacific Railroad, which merged in 1870 with the Southern Pacific (SP) Railroad. The SP constructed its first rail line from Sacramento to Modesto in May 1870, and progressed southerly to Fresno, Goshen, Hanford, and eventually Bakersfield (Orsi 2005:109-110). The Pacific Railroad Acts of 1862 authorized government bonds and land grants to the railroad companies to encourage homesteading by settlers along the 12,800 acres that paralleled the companies' rights-of-way (Beck and Haase 1974:67). This 20-mile easement enabled the development of many large towns, such as Fresno and Bakersfield, as well as smaller communities like Hanford and Tulare.

Hanford

The city of Hanford is located west of SR 99 near Visalia in Kings County between the rural towns of Lucerne and Guernsey. Established in 1852 as a sheepherder's camp, Hanford was historically located in Tulare County. Farming became prominent in the early 1870s as unexploited land was developed for agricultural purposes; farmsteads were established and irrigation ditches were constructed to distribute water to fields (JRP Historical Consulting 2000; Rice, Bullough, and Orsi 1996). The area was known regionally as the Mussel Slough, a 10- to 30-square-mile area,that was situated in a natural drainage sink between the Kings River and Tulare Lake. Lots soon were platted and actively sold in the new settlement, making Hanford an ideal location for a railroad hub in agriculture-rich Tulare County.

In 1877, the route of the SP was planned through the settlement, which was officially named for railroad auditor James Madison Hanford. However, on May 11, 1880, Hanford became the heart of a national news story known as the Mussel Slough Tragedy (Orsi 2005:441-442, 468). When the SP came through private properties, the settlers were titled "squatters" along the railroad's 20-mile right-of-way. This stirred up antagonism among the settlers who felt the wealthy railroad magnates were depriving them of the "American dream." After repeated but failed negotiation attempts between the parties, eviction notices were hand-delivered to a few resistant settlers on May 11, 1880; the gunfire that erupted between armed U.S. Marshals, the SP representatives, and settlers resulted in seven people dead (Orsi 2005:99-100). The Mussel Slough Tragedy made national headlines, bolstering anti-railroad sentiment as a "war against monopoly" and making heroes of the squatters who had protected their property rights (Orsi 2005:102-103; Rice, Bullough, and Orsi 1996:251-252).

After the Mussel Slough incident, fires devastated Hanford in both July 1887 and June 1891. The city was rebuilt, and on August 12, 1891, Hanford was incorporated in Tulare County; however, two years later it was transferred to and became the seat of the newly formed Kings County (Hoover et al. 2002:138-140).

Bakersfield

The city of Bakersfield is located on SR 99 between the towns of Oildale and Lamont in Kern County. In 1861, Colonel Thomas Baker founded Bakersfield by reclaiming tule swampland along the Kern River. Baker, a civil and hydraulic engineer as well as U.S. Senator (1861-62), purchased over 89,000 acres in 1869. He created waterways around Kern Lake and built a 27-mile-long toll road that connected the city to the Kern County seat of Havilah (Gudde 1998:24). In addition to Baker, James Ben Ali Haggin and Lloyd Tevis founded the Kern County Land Company, acquiring hundreds of acres and building a network of irrigation canals in the area.

Approximately 600 people resided in Bakersfield in 1870. This led to the town's incorporation in 1873 and its evolution into a transportation hub for stock and farm products on the SP line (Hoover et al. 2002:134). As the town solidified itself as the center of activity at the southern end of the Central Valley, the county seat moved from Havilah to Bakersfield in 1874 (Hoover et al. 2002:134). In 1889, a "great fire" devastated the town, destroying 15 city blocks and over 200 buildings. Nevertheless, Bakersfield recovered, and by the 1890s incorporated nearby Kern City, which was enjoying an oil boom, into its city limits, thereby increasing Bakersfield's population to roughly 2,620 (Hoover et al. 2002:136). By 1897, the Atchison, Topeka & Santa Fe (AT&SF), currently the BNSF Railway, arrived in Bakersfield and built a large rail yard outside of the city limits for both the AT&SF and the SP lines, which strengthened the town as a center for both the area's oil and railroad industries.

By the turn-of-the-century, the population of Bakersfield was over 4,000 and included a diverse ethnic community of French, Basque, Mexican, and other immigrants. Neighborhoods were formed and named appropriately for geographical cardinal directions, such as North Bakersfield, Northeast Bakersfield, and East Bakersfield. The California State University at Bakersfield opened in 1970, and since that year, the population has grown 400%—from 70,000 to 347,000 (California Department of Finance 2012).

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Chapter 6.0

Findings

6.0 Findings

6.1 Records Search Results

To identify the locations of previously recorded cultural resources and prior inventory surveys, a digital scan was performed of the SSJVIC USGS 7.5-minute quadrangles that intersect with the HST alignment. The quadrangles housed at the SSJVIC contain the plotted locations of sites and surveys for a particular region of California. Each quadrangle was georeferenced to real-world coordinates and placed in a GIS environment to enable accurate digitization of the individual resources and survey reports hand-plotted on the original maps. The resource and survey content, as of September 2009, on each quadrangle was then digitized to create a geodatabase of known resources and surveys. As a result of this effort, it was determined that 80 previous surveys have been conducted in areas that intersect the original archaeological APE (Authority and FRA 2011b). Appendix B, Records Search Results, provides the list of survey reports that intersect the APE. An update of the original records search was conducted in March 2011 to obtain any sites or surveys submitted to the SSJVIC since the quadrangles were scanned in September 2009. The changes to the APE that were provided in December 2011 were reviewed against the records search information obtained as of March 2011. Because the previous records searches encompassed the entire USGS quadrangle, the current changes to the APE were covered by these earlier records searches and no additional surveys were identified.

A total of 23 previously recorded archaeological resources are within 0.25 mile of the APE (see Table 6-1). Table 6-1 lists these previously recorded resources. The changes to the APE resulted in changes to the resources, with the identified sites presented in the ASR, as shown in Table 6-1. Of these sites, four previously recorded sites are in the current (March 30, 2012) APE (see Table 6-2), and two were not previously recorded in the ASR as being within the APE. P-16-000084 was recorded as an isolate and therefore will not be considered further (see Appendix B).

Table 6-1
Archaeological Resources Recorded within 0.25-mile of the APE (May 2012)

Number	Site Identifier (P#)	Resource Name (by recorder)	Site Constituents	Description	Comment/ Evaluation From Recording	In ASR?
1	P-16-000084	ISO-DM303	Prehistoric	Isolated obsidian biface	Isolate	Y
2	P-54-004285	Isolate 67	Prehistoric	Ground stone fragment	Isolate	N
3	P-54-004248	AN-7	Prehistoric	Lithic scatter	Agricultural field; disturbed	N
4	P-54-004293	Isolate 81	Prehistoric	Bowl mortar fragment	Isolate	N
5	P-54-004292	Isolate 80	Prehistoric	Cobble fragment	Isolate	N
6	P-54-004346	LSA-DEL-430-S-1	Historic	Structural remains and refuse of a possible home site	None provided	Y
7	P-54-004347	LSA-DEL-430-S-2	Historic	Dense refuse deposit, dating 1914-1945	None provided	Y

Table 6-1
Archaeological Resources Recorded within 0.25-mile of the APE (May 2012)

Number	Site Identifier (P#)	Resource Name (by recorder)	Site Constituents	Description	Comment/ Evaluation From Recording	In ASR?
8	P-15-11454	IF#2	Prehistoric	Chalcedony flake found during cultural resource assessment of Rosedale Ranch	None provided	Y
9	P-15-11453	IF#1	Prehistoric	Obsidian biface found during cultural resource assessment of Rosedale Ranch	None provided	Y
10	P-15-12881	1586 JL Site 1	Prehistoric	Site contains a moderately dense scatter of highly fragmented and burned faunal remains	None provided	Y
11	P-15-003072	unused field on T	Prehistoric	An unused field on Texaco Refinery property; has been disked and plowed. Flakes found out of context	None provided	Y
12	P-15-002243	Caltrans Highway	Prehistoric	Chalcedony core shatter and obsidian flake	Site destroyed	Y
13	P-15-009016	Centennial Garden	Historic	Historic trash pits associated with houses on the property; dating 1890-1940	None provided	Y
14	P-54-000020	Site Tul-20	Prehistoric	Human burial 1-19	None provided	Y
15	P-10-00568	None provided	Prehistoric	Suspected site; no artifacts	A mound only; no other site evidence	Y
16	P-10-00569	None provided	Prehistoric	Suspected site; no artifacts	A mound only; no other site evidence	Y
17	P-54-003382	ISO-DM304	Prehistoric	Stage 5 biface was found near BNSF tracks	None provided	Y
18	P-54-003383	ISO-DM305	Prehistoric	Chert Flake found near BNSF rails	None provided	Y
19	P-16-000012	None provided	Prehistoric	Lithics, bone, obsidian	Site destroyed	Y

Table 6-1
Archaeological Resources Recorded within 0.25-mile of the APE (May 2012)

Number	Site Identifier (P#)	Resource Name (by recorder)	Site Constituents	Description	Comment/ Evaluation From Recording	In ASR?
20	P-54-000473	None provided	Prehistoric	Sparse scatter of lithic debitage and other artifacts	None provided	Y
21	P-15-02507	Pro-3	Prehistoric	Anecdotal description of willow huts, habitation debris	Site destroyed	Y
22	P-15-03029	Rosedale town center	Historic	Site is a flat open field designated as original Rosedale town site	None provided	Y
23	P-16-000068 (CA-KIN-69H)		Historic	Trash scatter	Disturbed	N

Acronyms:

APE = Area of Potential Effects
ASR = Archaeological Survey Report

SR = State Route

Table 6-2
Archaeological Resources within the APE

Resources	Description	National Register Eligibility*	Alternatives						In ASR?
			[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Newly Recorded Resources									
HST-A-TUL-1	Prehistoric deposit	Ineligible	[redacted]						Y
HST-A-TUL-3	Prehistoric deposit	Ineligible	[redacted]						Y
HW-JR-1	Historic foundations	Ineligible					[redacted]		N
Previously Recorded Resources									
CA-KIN-69H/ P-68	Historic deposit	Appears ineligible					[redacted]		N
P-16-84	Prehistoric isolate	Exempted under PA	[redacted]						N

Table 6-2
Archaeological Resources within the APE

Resources	Description	National Register Eligibility*	Alternatives						In ASR?
			[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
CA-TUL-473	Prehistoric deposit	Appears ineligible				[redacted]			N
CA-TUL-2950H/ P-54-4737 (Stoil Site)	Historic settlement	Appears ineligible				[redacted]			Y
CA-KER-2507	Prehistoric deposit	Appears ineligible		[redacted]				[redacted]	Y

* Eligibility determination was concurred with by SHPO, February 2012.

** All references to the Hanford West Bypass in this section refer to the combined footprints of all four Hanford West Bypass alternatives. See Chapter 3.0 for a discussion of the individual alternatives.

Acronyms:

APE = Area of Potential Effects
ASR = Archaeological Survey Report
BNSF = BNSF Railway
PA = Section 106 Programmatic Agreement (Authority and FRA 2011d)
SHPO = State Historic Preservation Office

CA-TUL-473, recorded by Davis and Cursi (1977), is described as a “sparse scatter of lithic debitage and artifacts spread over a plowed field.” [redacted] it was probably a large site that has been disturbed and re-deposited over a large area. CA-KIN-69H was recorded as a sparse scatter of historic trash that is highly disturbed and of “questionable integrity” (Tang and Ballester 2001).

6.2 Historic Research and Map Analysis

To supplement the historic map research and map analysis provided in the ASR (Authority and FRA 2011b), a review of the historic maps on file, including Sanborn Maps, was conducted for the newly revised areas of the APE. This research sought to identify areas where previously unrecorded historic-era archaeological resources might be found in order to identify areas in the APE where historic-era resources may be encountered during construction.

6.2.1 Chinatown “Tunnels”

Public comments on the *Draft Environmental Impact Report/Environmental Impact Statement for the Proposed California High-Speed Train System* (Authority and FRA 2011c) made by a member of Chinatown Revitalization Inc. of Fresno (CRI) and others make mention of “extensive underground tunnels and block-long basements that run the entire length and depth of Chinatown” on both sides of the existing BNSF railroad tracks (CRI 2011). The City of Fresno’s Planning and Development Department website indicates an investigation of the Chinatown “tunnels” using ground-penetrating radar (GPR) was conducted in 2008 and reported in the *Fresno Chinatown Project Extended Phase I Study* (J & R Environmental Services 2008), along with a neighborhood survey of Chinatown called the “Chinatown Historic Resources Survey” (Architectural Resources Group 2006; City of Fresno 2012).

Although information regarding the tunnels appears anecdotal, additional research was conducted to determine whether substantial evidence of the tunnels existed. A request to the SSJVIC was issued in November 2011 to determine if any formal reports on the tunnels in Fresno had been submitted; no new information regarding Fresno's Chinatown was identified by SSJVIC staff.

In addition, Sanborn Fire Insurance Maps of Fresno's Chinatown were reviewed for any evidence of "tunnels" or underground anomalies. Sanborn Maps were created for the City of Fresno for the years 1885, 1888, 1898, 1906, 1918, 1948, and 1950. The only evidence of a tunnel in any of the maps reviewed is associated with the Pacific Coast Seeded Raisin Company, which shows a "tunnel for raisin conveyer under street to Plant No. 5" from Plant No. 6 that crossed Tulare Street north of G Street (Sanborn 1918: Sheet 62).

The City of Fresno's Planning and Development Department was contacted regarding the alleged "tunnels" in Chinatown and the reports mentioned on the website. The response was that the GPR investigation was "inconclusive" and the report was "never released to the public" (Hattersley-Drayton 2012); however, a letter report by J & R Environmental Services (2007), which summarized its preliminary findings, was provided to URS by the City of Fresno. A copy of the Chinatown Historic Survey was obtained from the City of Fresno's website.

The Chinatown Historic Resources Survey obtained from the City of Fresno's website encompasses the blocks bounded by Mariposa, Inyo, E, and G Streets (Architectural Resources Group 2006). The survey was undertaken to develop an accurate inventory of the existing historic resources for management purposes, as the area has been "particularly impacted by demolition and redevelopment projects" (Architectural Resources Group 2006:2). Research for the project was extensive; however, the investigation produced "no evidence…to substantiate the existence of tunnels" in Fresno's Chinatown (Architectural Resources Group 2006:58).

The letter report summarizing the preliminary results of the GPR investigations appears to dispel the accounts of "tunnels" in Fresno's Chinatown (J & R Environmental Services 2007). While the GPR survey showed underground anomalies in various locations, archaeological investigations of these anomalies showed "no true tunnels or doorways suggesting tunnels" (J & R Environmental Services 2007:6). Instead, the anomalies are expansive partitioned basements (such as at F and Kern streets) or appear to be the 4- to 10-inch water pipe running the length of China Alley, as depicted on various Sanborn Maps (for example, 1906: Sheet; 1918: Sheet 62). The results appear to have been characterized "inconclusive" because J & R Environmental Services was not able to access the anomalies on China Alley encountered during the GPR survey to confirm they are remnant water pipes (J & R Environmental Services 2007:6).

6.3 Field Inventory

For the purposes of the sASR, an intensive pedestrian survey to inventory archaeological resources within the areas of the revised APE was conducted in December 2011. The acres surveyed during this field session were incorporated into the total acres surveyed from the Spring and Summer 2010 surveys submitted as part of the ASR.

Therefore, the current APE encompasses a total of 10,640 acres. PTE was obtained for approximately 39%, or 4,172-acres, of this area. In addition to restrictions on entry, portions of the APE could not be surveyed because of crop cover, vegetation, or urbanization. As a result, 52%, or 2,186 acres, of the PTE area were surveyed. In terms of the total footprint of the APE, as currently configured, this acreage represents 21% of the total area. The remaining acreage was not surveyed for several reasons: (1) PTE received from landowners was conditional and could not be obtained at the time of the survey; (2) there was no way to ingress specific parcels (e.g., the only access to a parcel was across property for which PTE had not been obtained); or

(3) ground visibility was completely obscured and parcels were completely paved, otherwise developed, or currently under cultivation with a dense non-row crop.

Table 6-3 indicates the amount of the area surveyed where access was granted (i.e., PTE) against the total area that represents the APE. The table also shows the total amount of area accessible as a percentage of the total APE. Figure 6-1 conveys the surveyed area by alignment alternative and in terms of parcel accessibility.

Table 6-3
Summary of Survey Effort by Alternative

Alternative	Acreage in APE (Footprint)	Acreage with PTE		Acreage Surveyed		
		Total	Percentage of APE	Total	Percentage of Land with PTE*	Percentage of Total APE
Allensworth Bypass	578	57	10%	57	100%	10%
Bakersfield Hybrid	167	14	9%	1	4%	0%
Bakersfield South	67	0	0%	0	0%	0%
BNSF Alternative	7,159	3,206	45%	1,778	55%	25%
Corcoran Bypass	219	67	31%	59	88%	25%
Hanford West Alternatives Combined	1,242	61	5%	50	81%	4%
Through Corcoran - East BNSF	153	16	10%	13	81%	8%
Wasco-Shafter Bypass	1,055	750	71%	229	31%	22%
Totals	**10,640**	**4,172**	**39%**	**2,186**	**52%**	**21%***

Note: Where the alternative alignments diverge and converge with the BNSF Alternative, the survey acreage contained within the construction footprint is reported for both alternatives. The calculations presented above are not affected by this overlap area since these areas are counted toward both the alternative alignment and the BNSF Alternative.

Acronyms and Abbreviations:

APE = area of potential effects
PTE = permission to enter

*Includes land that was surveyed when initial denial of access was granted.

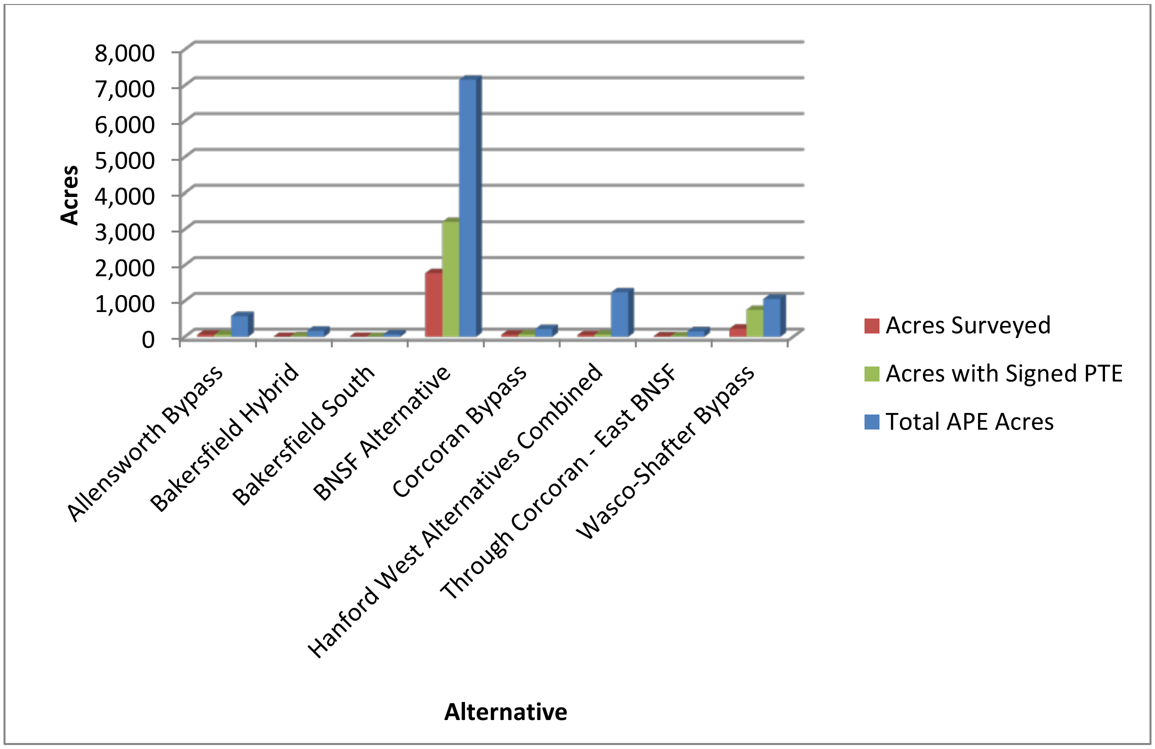

Figure 6-1
Total surveyed area by alternative through December 2011

Recorded Resources

The surveys conducted for the revised APE resulted in the identification of one historic archaeological site, which is discussed in greater detail below (see Appendix C). In addition, one isolate was identified within the Hanford West Bypass, which is exempted from consideration as an historical property per the Section 106 PA (see Figure 6-2).

REDACTED FROM THIS VERSION

Figure 6-2
Newly recorded cultural resources identified through December 2011

HW-JR-1 [redacted]

This resource consists of an unreinforced-concrete, raised perimeter foundation (stem wall) with several associated structural features and sparse domestic and agricultural artifacts. The primary foundation is made of poor-quality aggregate and cement, and measures 28 feet (north/south) by 37.5 feet (east/west), with approximately 9 inches exposed above the ground surface. No foundation bolts are present, and only a small section of 2- by 4-inch mudsill is present, with 16 penny wire-cut nails. Along the western edge of the foundation are two low, finished concrete steps that indicate the entrance to the structure. Also present is a sash weight that indicates the structure had double-hung wood windows. In the northeast corner of the interior space of the structure is a concrete-lined depression measuring 11 feet square and at least 4 feet deep. This may represent a cellar or tank. At the back (east) of the structure is a small, raised brick pad (measuring 7 feet square), and a well/water pump. One olive, one persimmon, and one orange tree are adjacent to the structural remnants. Few diagnostic artifacts are located in the vicinity of the structural remains, but these include bedsprings, casters, and other domestic debris. A building is shown on the location of the site on the 1926 and 1954 Hanford 7.5-minute quadrangle maps. Given the lack of discrete artifact concentrations and a lack of association with significant persons or events, the site is considered ineligible for the NRHP/CRHR.

CA-KIN-69H (P-54-68) [redacted]

This site was recorded as a sparse scatter of historic-era refuse, such as fragments of aqua and sun-colored amethyst glass that had no clear associations to important research questions or individuals of importance in California history. The recorder indicated that the site was not a significant site, with no demonstrable associations, and that it has been substantially disturbed by roadwork and levee work. Therefore, this site is considered exempted from evaluation under the PA as an isolated refuse dump and scatter that may be over 50-years old that lacks specific associations. Therefore, this site is not considered a historical property under the NHPA or CEQA.

CA-TUL-473 [redacted]

This site was recorded by Davis and Cursi (Davis and Cursi 1977), and is described as a "sparse scatter of lithic debitage and artifacts spread over a plowed field." [redacted] it was probably a large site that has been disturbed and re-deposited over a large area. Due to the amount of re-deposition or spreading the site has experienced, no intact or discrete deposit at this location is currently recorded. The area that was delineated by the site recorders was not accessible for survey due to lack of permission. Even if access was granted, the site area is currently flooded as part of the [redacted] activities and would not have been subject to a pedestrian survey. This site is therefore considered destroyed. As such, this site is not considered a historical property under the NHPA or CEQA.

6.4 Conclusions

This sASR discussed the results of additional efforts to identify and evaluate archaeological resources within the area representing changes to the APE for the Fresno-Bakersfield Section of the HST. Given the rate of landscape change in the San Joaquin Valley and the proximity of the proposed alignment to areas of urban, railroad, and agricultural activities, the lack of substantial and intact surface manifestations of cultural activity is not unexpected. However, as indicated by the results of the research on the geomorphic setting and the overall sensitivity of the Tulare Lake region, as well as the paucity of accessible area available to survey, additional efforts to examine these areas in more detail will be required as planning proceeds. Indeed, as mandated by the PA, the process of establishing a preferred alignment and the subsequent development of a MOA and archaeological treatment plans will address the details of the research design, types of field methods, and scopes of possible mitigation procedures for resources potentially affected by future changes to the APE and changes prior to the construction of the project.

Section 7.0
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Section 8.0
Preparer Qualifications

8.0 Preparer Qualifications

The survey efforts were supervised by archaeologists who meet the professional qualification standards in Archaeology and Historic Preservation, Secretary of Interior's Standards and Guideline (Federal Register, Volume 48, No. 190, September 29, 1983).

The FRA managed the implementation of the survey plan, while specific functions were carried out by qualified consultants who performed the field studies described in the survey plan as well as laboratory activities and reporting. All decisions on level of effort or discretionary actions described in the survey plan were approved by the FRA prior to their implementation.

The following staff performed fieldwork or contributed to the Supplemental ASR for the Fresno to Bakersfield Section.

Karin Goetter Beck holds a bachelor's degree in Anthropology from the University of California, Los Angeles, and a master's degree in Cultural Resources Management from Sonoma State University. Ms. Beck is a Registered Professional Archaeologist (RPA) and a Registered Professional Historian. She has 16 years of experience in both prehistoric and historical archaeology, with 14 years of experience in cultural resources management.

Dean Martorana, RPA, holds a master's degree in Anthropology from California State University, Long Beach. He served as the lead archaeologist on the project. Mr. Martorana has 13 years of experience in both prehistoric and historical archaeology, including 10 years of experience in cultural resources management in Northern California. Mr. Martorana specializes in GIS and geophysical techniques applied to archaeology.

Vance G. Benté, RPA, provided peer review of the ASR. Mr. Benté holds a master's degree in Anthropology from California State University, Northridge, and has over 30 years of professional experience in archaeology and cultural resources management in California.

Jay Rehor, RPA, holds a bachelor's degree in Anthropology from the University of California, Santa Cruz, and a master's degree in Cultural Resources Management from Sonoma State University. He has 14 years of experience in California archaeology, with 12 years of experience in cultural resources management. Mr. Rehor specializes in geoarchaeological studies and landscape evolution as it relates to archaeology.

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Appendix A
Area of Potential Effects Mapping

(Provided separately)

Appendix B
Records Search Results

REDACTED

Appendix C

DPR Forms of Identified Archaeological Resources

REDACTED