

California High-Speed Rail Authority

Merced to Fresno Section: Central Valley Wye

**Final Supplemental Section 106
Findings of Effect Report**

May 2018

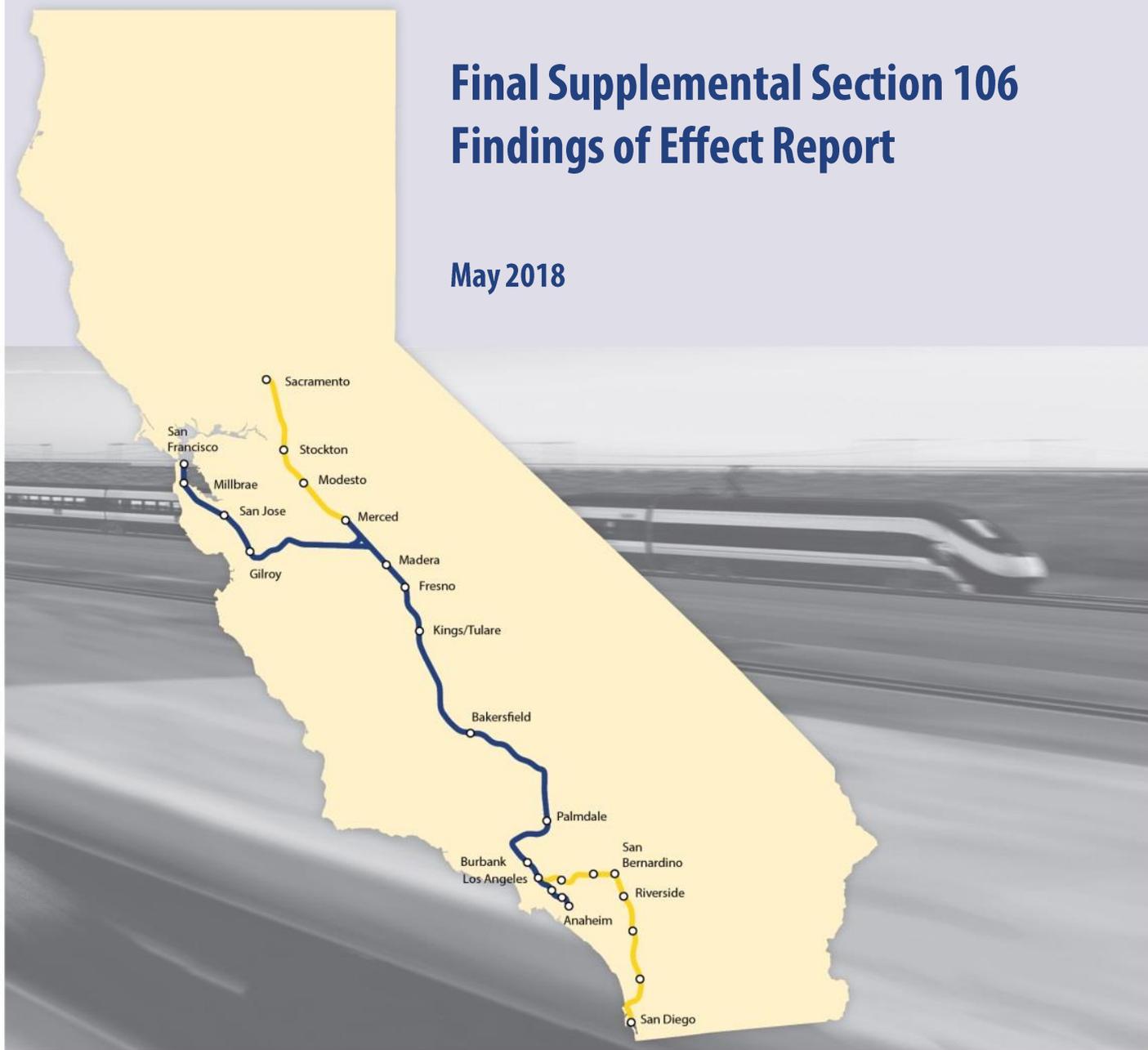


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ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effects
ASR	Archaeological Survey Report
ATP	Archaeological Treatment Plan
Authority	California High-Speed Rail Authority
BETP	Built Environment Treatment Plan
BNSF	BNSF Railway
CAL FIRE	California Department of Forestry and Fire Protection
Central Valley Wye	Merced to Fresno Section: Central Valley Wye
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CRHR	California Register of Historical Resources
CVP	Central Valley Project
EINU	electrical interconnections and network upgrades
EIR	environmental impact report
EIS	environmental impact statement
ESRI	Environmental Systems Research Institute
FOE	Finding of Effect
FRA	Federal Railroad Administration
HASR	Historic Architecture Survey Report
HPSR	Historic Properties Survey Report
HSR	high-speed rail
IAMF	Impact avoidance and minimization feature
kV	kilovolt
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PG&E	Pacific Gas and Electric
ROD	Record of Decision
Section 106 PA	Programmatic Agreement among the Federal Railroad Administration, Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historical Preservation Act as it Pertains to the California High-Speed Train Project
SHPO	State Historic Preservation Officer
SOI	Secretary of the Interior

SR	State Route
TPSS	traction power substation
U.S.C.	U.S. Code
WEAP	worker environmental awareness program

1 SUMMARY OF FINDINGS OF EFFECT

1.1 Findings for Section 106 Cultural Resources

This Merced to Fresno Project Section Supplemental Section 106 Findings of Effect (FOE), Central Valley Wye was prepared by the Federal Railroad Administration (FRA) and the High-Speed Rail Authority (Authority) to assess the effects from the California High-Speed Rail (HSR) Merced to Fresno Section: Central Valley Wye (Central Valley Wye) undertaking of the California HSR Program. The purpose of this FOE is to assist the FRA, as lead federal agency, in complying with Section 106 of the National Historic Preservation Act (NHPA) and the implementing regulations of the Advisory Council on Historic Preservation, as these pertain to federal undertakings and their impacts on historic properties. “Historic properties” are defined as any prehistoric or historic site, district, building, structure, or object that is listed in the National Register of Historic Places (NRHP), has been determined eligible for listing in the NRHP, or meets the criteria for listing in the NRHP (36 Code of Federal Regulations [C.F.R.] § 800.16(l)). This FOE follows the procedures and guidelines set forth in the *Programmatic Agreement among the Federal Railroad Administration, Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historical Preservation Act as it Pertains to the California High-Speed Train Project* (Section 106 PA) (Authority and FRA 2011).

The FRA and California High-Speed Rail Authority (Authority) prepared a Merced to Fresno Section Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) in 2012 (Authority and FRA 2012a), supported by findings from an Historic Architecture Survey Report (HASR) (Authority and FRA 2012b), an Historic Properties Survey Report (HPSR) (Authority and FRA 2012c), an Archaeological Survey Report (ASR) (Authority and FRA 2012d) and an FOE report (Authority and FRA 2012e). The Merced to Fresno Section included alignment alternatives for the Central Valley Wye, but at the time of approval of the Merced to Fresno Section EIR/EIS, a decision on the alignment of the wye connection was deferred for future environmental analysis. A Memorandum of Agreement (MOA) was prepared for the Merced to Fresno Section but did not include the Central Valley Wye alternatives (Authority and FRA 2013b). Since 2012, the Authority and FRA conducted additional studies of potential wye alternatives and outreach with the permitting agencies and the public resulting in a range of four wye alternatives analyzed in a supplemental EIR/EIS to the Merced to Fresno Section Final EIR/EIS. To support the findings of the supplemental environmental document, two supplemental ASR and two supplemental HASR reports (Authority and FRA 2016a; 2016b; 2016c; 2016d) and this FOE have been prepared specific to the four Central Valley Wye alternatives described in Section 2, Description of Undertaking. Table 1-1 below lists cultural resources compliance documentation associated with the Merced to Fresno Section and for the Central Valley Wye alternatives. Appendix A, SHPO Correspondence, provides the consultation letters from the State Historic Preservation Office (SHPO) regarding their review of the HASRs, ASRs, and this FOE.

As permitted under the Surface Transportation Project Delivery Program, the State of California has requested that FRA assign its responsibilities under the National Environmental Policy Act (NEPA) and related federal environmental laws to the Authority. The program is authorized by 23 U.S. Code (U.S.C.) section 327 and has been implemented by the Federal Highway Administration, FRA, and Federal Transit Administration through joint regulations defining project and applicant eligibility, the application requirements, and the requirements for a written Memorandum of Understanding (MOU) approving the assignment. During the application process, the public will be given two opportunities to review application materials and provide comments: one opportunity to review a draft application as part of a state public comment process, and another opportunity provided by FRA to review the final application and a draft MOU.

Because the Authority is still developing its application, the FRA remains the federal lead agency for purposes of compliance with NEPA and other federal environmental laws, including Section 106. However, if the Authority formally submits an application and the FRA approves the application prior to the Record of Decision (ROD) for the Wye, the Authority may issue the ROD

and finalize any related environmental reviews in lieu of the FRA, including compliance with Section 106. The FRA will retain responsibility for formal government-to-government consultation with federally recognized Native American tribes.

The Central Valley Wye alternatives would be constructed using a design-build procurement process, and the area of potential effects (APE) is based on the current level of design, approximately 15 percent. The Merced to Fresno Section APE overlaps with the Central Valley Wye APE adjacent to State Route (SR) 99 at Chowchilla. Cultural resources surveys conducted for the approved Merced to Fresno Section overlap with the Central Valley Wye APE, and one historic property, the Robertson Boulevard Tree Row, is common to both the Merced to Fresno Section APE and the Central Valley Wye APE. This historic property is further addressed by the Central Valley Wye studies. No known archaeological resources within the archaeological APE for the Merced to Fresno Section qualified as historic properties. For the purposes of the Central Valley Wye alternatives, the overlapping portions previously surveyed in 2012 were not resurveyed and the eligibility findings for built resources remains valid.

Per Stipulation V.D, of the Merced to Fresno Section MOA, the Authority may propose revisions to the BETP and the ATP without amending the MOA if they notify the MOA signatories and receive written concurrence from the SHPO. The Authority and FRA anticipate that only the treatment plans will be revised to incorporate the Central Valley Wye APE without formally amending the Merced to Fresno Section MOA because there are no additional known properties that would be adversely affected. While it is anticipated that the MOA will not need to be amended, this will be determined in consultation with SHPO.

The built environment treatment plan (BETP) and the archaeological treatment plan (ATP) prepared for the Merced to Fresno Section (Authority and FRA 2012f, 2013c, 2013d, 2013e) will be amended by the Authority to reflect information developed for the Central Valley Wye alternatives. As design advances post record of decision (ROD), the treatment plans may be further revised to address any new effects resulting from the completion of the design process and as access to unsurveyed parcels is granted. In accordance with the Section 106 PA and the Merced to Fresno Section MOA, the Authority and FRA, in consultation with the SHPO, affected tribes, interested parties, and other signatories and concurring parties to the MOA, will continue to identify historic properties within the project footprint of the preferred Central Valley Wye alternative, evaluate their eligibility for the NRHP, and resolve any adverse effects on built and archaeological properties. The BETP and/or the ATP will be amended as needed to address treatment for any previously unidentified built and unknown archaeological properties discovered during phased identification and construction, including survey, evaluation, effects findings, consultation, and mitigation if needed.

Table 1-1 Section 106 Activities in the Merced to Fresno Section, including the Central Valley Wye Alternatives

Report Title	Date	SHPO Concurrence Date
Merced to Fresno Section, Final Historic Property Survey Report	February 2012	March 13, 2012
Merced to Fresno Section, Final Historic Architectural Report	February 2012	March 13, 2012
Merced to Fresno Section, Final Findings of Effect	July 2012	July 26, 2012
Merced to Fresno Final Built Environment Treatment Plan	August 2012	Not Applicable
Merced to Fresno Memorandum of Agreement	August 2012	Not Applicable
Merced to Fresno Section, Final Findings of Effect Addendum No. 1	May 2013	Not Applicable
Merced to Fresno Final Built Environment Treatment Plan Addendum No. 1	May 2013a	Not Applicable

Report Title	Date	SHPO Concurrence Date
Merced to Fresno Final Built Environment Treatment Plan Addendum No. 2	May 2013a	Not Applicable
Merced to Fresno First Amendment to Memorandum of Agreement	June 2013	Not Applicable
Central Valley Wye Archaeological Survey Report	October 2016	November 18, 2016
Central Valley Wye Historic Architectural Survey Report	October 2016	November 18, 2016
Central Valley Wye Historic Architectural Survey Report, Addendum 1: Electrical Interconnections and Network Upgrades	October 2016	November 18, 2016
Central Valley Wye Archaeological Survey Report, Addendum 1: Electrical Interconnections and Network Upgrades	November 2016	November 18, 2016
Merced to Fresno Second Amendment to Memorandum of Agreement	January 2017	Not Applicable

Source: Author's compilation
SHPO = State Historic Preservation Officer

This FOE presents the effects analysis for historic properties identified in the Central Valley Wye APE, as documented in the *Merced to Fresno Section: Central Valley Wye Archaeological Survey Report* (Authority and FRA 2016a), the *Merced to Fresno Section: Central Valley Wye Historic Architectural Survey Report* (Authority and FRA 2016b), the *Merced to Fresno Section: Central Valley Wye Electrical Interconnections and Network Upgrades Historic Architectural Survey Report, Addendum 1* (Authority and FRA 2016c) and the *Merced to Fresno Section: Central Valley Wye Electrical Interconnections and Network Upgrades Archaeological Survey Report, Addendum 1* (Authority and FRA 2016d). The Central Valley Wye HASRs and ASRs, in accordance with the Section 106 PA and the MOA, were reviewed by the SHPO and the MOA signatories and concurring parties. The SHPO concurred with the adequacy of the identification efforts and eligibility determinations presented in the Central Valley Wye ASRs and HASRs on November 18, 2016 (Appendix A). The SHPO concurred with the findings presented in this FOE on April 6, 2018 (Appendix A).

This FOE follows the guidelines for documentation as required in the Section 106 PA and C.F.R. title 36, section 800.11. This FOE analyzes the undertaking's potential effects on five known historic properties (prehistoric site WW-01, Chowchilla Canal, Robertson Boulevard Tree Row, Delta-Mendota Canal, and California Aqueduct) in the Central Valley Wye APE. It also analyzes the potential effects on yet unsurveyed, or unknown, built, and archaeological historic properties that will be addressed during phased identifications.

This FOE concludes that the Central Valley Wye alternatives would cause adverse effects on unidentified or unknown built and archaeological historic properties; no adverse effect on one historic property, the Chowchilla Canal; direct adverse effects on one historic property, the Robertson Boulevard Tree Row; and no effect on three historic properties, prehistoric site WW-01, the Delta-Mendota Canal, and the California Aqueduct. Table 1-2 presents a findings summary for all properties subjected to the effects analysis in Chapter 4, Description of Historic Properties, Application of Criteria of Adverse Effect. Section 4.2, Archaeological Historic Properties, and Section 4.3, Built Environment Historic Properties, present conditions proposed for known properties with findings of adverse effects.

Table 1-2 Section 106 Effects Findings for Historic Properties within the APE for the Merced to Fresno Section: Central Valley Wye Alternatives

Map ID No.	Resource Name	City, County	Year Built	Effect Findings
None	Unknown archaeological historic properties	Merced and Madera Counties	N/A	Potential adverse effect
Various	Unknown built environment historic properties (67 parcels inaccessible for survey)	Merced and Madera Counties	N/A	Potential adverse effect
None	WW-01	Merced County	Prehistoric	No effect
197	Chowchilla Canal	Merced County	1872	No adverse effect
423	Robertson Boulevard Tree Row	Chowchilla, Madera County	1912	Adverse Effect - Direct
None	Delta-Mendota Canal	Merced County	1946-1951	No effect
None	California Aqueduct	Merced County	1960-1974	No effect

Source: Authority and FRA, 2016a 2016b, 2016c, 2016d; 2017

N/A = Not Applicable

2 DESCRIPTION OF UNDERTAKING

2.1 Project Description

This FOE evaluates four Central Valley Wye HSR alternatives and associated electrical interconnection and network upgrades (EINU), as well as upgrades to existing Pacific Gas and Electric (PG&E) network facilities (network upgrades) required to meet the projected power demands of the HSR system. The Central Valley Wye alternatives would cross Merced and Madera Counties near Chowchilla. PG&E network upgrades are located in Stanislaus, Merced, Madera, and Fresno Counties. Activities in Fresno and Stanislaus Counties relate only to the network upgrades and would not include any portion of the Central Valley Wye alternatives.

The HSR alignment would be entirely grade-separated, meaning that crossings of roads, railroads, and other transport facilities would use overpasses or underpasses so that the HSR would operate independently of other modes of transport. The HSR right-of-way would also be fenced to prevent public or vehicle access. The project footprint for each Central Valley Wye alternative would primarily consist of the train right-of-way, which would accommodate two sets of tracks in an area with a minimum width of 100 feet. Additional right-of-way would be required to accommodate grade separations, embankments, traction power facilities, and transitional portions of the Central Valley Wye alternatives that allow for bidirectional interface between north-south and east-west trending alignments.

The Central Valley Wye alternatives would include at-grade, below-grade, and above-grade (elevated) track segments. The at-grade track would be laid on an earthen rail bed raised between 6 and 10 feet off the ground level, set on ties with rock ballast; 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, if necessary. Elevated track segments would span some waterways, roadways, or other railroad and HSR tracks, and would consist of precast, pre-stressed concrete box girders, cast-in-place concrete box girders, or steel box girders. The height of elevated track sections would depend on the height of existing structures below, or clearances to existing roads or other HSR facilities, and would range from 35 to 90 feet above grade. Columns would be spaced approximately 100 to 150 feet apart on average. The following sections and tables summarize the design features for the four Central Valley Wye alternatives.

2.2 SR 152 (North) to Road 13 Wye Alternative

The State Route (SR) 152 (North) to Road 13 Wye Alternative would follow the existing Henry Miller Road and SR 152 rights-of-way as closely as possible in the east-west direction, and the Road 13, SR 99, and BNSF Railway (BNSF) rights-of-way in the north-south direction. Deviations from these existing transportation routes or corridors would be necessary to accommodate design requirements; specifically, wider curves are necessary to accommodate the speed of the HSR compared to lower-speed roadway alignments. The SR 152 (North) to Road 13 Wye Alternative would not follow existing transportation rights-of-way where it transitions from following one transportation corridor to another.

The SR 152 (North) to Road 13 Wye Alternative would extend approximately 52 miles, mostly at-grade on raised embankment, although it would also have aerial structures and a segment of retained cut (depressed alignment). The wye configuration of this alternative would be located southwest of Chowchilla, with the east-west axis along the north side of SR 152 and the north-south axis on the east side of Road 13.

The EINU required for this alternative would include a 115 kilovolt (kV) traction power substation (TPSS) and switching station for Site 6—El Nido and a 230 kV TPSS and an approximately 2.3-mile double-circuit 230 kV transmission line for Site 7—Wilson.¹ To support this interconnection, PG&E would need to rebuild the existing Wilson 230 kV Substation to a 4-Bay Breaker-And-A-

¹ The 230 kV TPSS and approximately 0.5 mile of the 230 kV Tie-Line were previously analyzed in the Merced to Fresno Final EIR/EIS.

Half within the existing fence line. Network upgrades would include expanding the El Nido Substation and reconductoring (i.e., replacing existing conductor with more efficient conductor and replacing or modify existing poles/towers) approximately 30.2 miles of existing power lines.

Table 2-1 summarizes the design features of the SR 152 (North) to Road 13 Wye Alternative.

Table 2-1 Design Features of the SR 152 (North) to Road 13 Wye Alternative

Feature	SR 152 (North) to Road 13 Wye Alternative
Total length (linear miles) ¹	52
At-grade profile (linear miles) ¹	48.5
Elevated profile (linear miles) ¹	3
Below-grade profile (linear miles) ¹	0.5
Number of straddle bents	32
Number of railroad crossings	1
Number of major water crossings	12
Number of road crossings	62
Approximate number of public roadway closures	38
Number of roadway overcrossings and undercrossings	24
Traction power substation sites	1
Switching and paralleling stations	1 switching station, 8 paralleling stations
Signaling and train-control elements	18
Communication towers	9
Wildlife crossing structures	39

Source: Authority, 2016

¹ Lengths shown are based on equivalent dual-track alignments and are one-way mileages. For example, the length of single-track elevated structure will be divided by a factor of 2 to convert to dual-track equivalents.

2.3 SR 152 (North) to Road 19 Wye Alternative

The SR 152 (North) to Road 19 Wye Alternative would follow the existing Henry Miller Road and SR 152 rights-of-way as closely as practicable in the east-west direction and Road 19, SR 99, and BNSF rights-of-way in the north-south direction. Deviations from these existing transportation corridors would be necessary to accommodate design requirements; specifically, larger curves would be necessary to accommodate the high speed of the HSR compared to lower-speed roadway alignments. The SR 152 (North) to Road 19 Wye Alternative would not follow existing transportation rights-of-way as it transitions from following one transportation corridor to another.

The SR 152 (North) to Road 19 Wye Alternative would extend approximately 55 miles, mostly at-grade on embankment, although it would also have aerial structures, retained cut (depressed alignment), and depressed tunnel undercrossings of major railroad and highway corridors. The wye configuration of this alternative would be located southeast of Chowchilla and north of Fairmead, with the east-west axis along the north side of SR 152 and the north-south axis on the east side of Road 19.

As the alignment approaches Avenue 25, the San Jose to Merced and Merced to Fresno legs would converge, requiring the northbound track of the San Jose to Merced leg to rise on an aerial structure and cross over the tracks of the Merced to Fresno leg.

The EINUs required for this alternative would include a 115 kV TPSS and switching station for Site 6—El Nido and a 115 kV TPSS connected to a new switching station via a new approximately 2.6-mile double-circuit 115 kV power line for Site 7—Le Grand Junction/Sandy Mush Road. Network upgrades would include expanding the El Nido Substation and reconductoring 38.4 and 41.5 miles of existing transmission and power lines, respectively.

Table 2-2 summarizes the design features of the SR 152 (North) to Road 19 Wye Alternative.

Table 2-2 Design Features of the SR 152 (North) to Road 19 Wye Alternative

Feature	SR 152 (North) to Road 19 Wye Alternative
Total length (linear miles) ¹	55
At-grade profile (linear miles) ¹	48.5
Elevated profile (linear miles) ¹	3.5
Below-grade profile (linear miles) ¹	3
Number of straddle bents	31
Number of railroad crossings	3
Number of major water crossings	13
Number of road crossings	65
Approximate number of public roadway closures	36
Number of roadway overcrossings and undercrossings	29
Traction power substation sites	2
Switching and paralleling stations	2 switching stations, 7 paralleling stations
Signaling and train-control elements	21
Communication towers	6
Wildlife crossing structures	41

Source: Authority, 2016

¹ Lengths shown are based on equivalent dual-track alignments and are one-way mileages. For example, the length of single-track elevated structure will be divided by a factor of 2 to convert to dual-track equivalents.

2.4 Avenue 21 to Road 13 Wye Alternative

The Avenue 21 to Road 13 Wye Alternative would follow the existing Henry Miller Road and Avenue 21 rights-of-way as closely as practicable in the east-west direction and the Road 13, SR 99, and BNSF rights-of-way in the north-south direction. Deviations from these existing transportation corridors would be necessary to accommodate design requirements; specifically, larger curves would be necessary to accommodate the high speeds of the HSR compared to lower-speed roadway alignments. The Avenue 21 to Road 13 Wye Alternative would not follow existing transportation rights-of-way as it transitions from following one transportation corridor to another.

The Avenue 21 to Road 13 Wye Alternative would extend approximately 53 miles, mostly at-grade on embankment, although it would also have aerial structures and a short segment of retained cut (depressed alignment). The wye configuration of this alternative would be located approximately 4 miles southwest of Chowchilla, with the east-west axis along the north side of Avenue 21 and the north-south axis on the east side of Road 13.

The EINUs required for this alternative would include a 115 kV TPSS and switching station for Site 6—El Nido and a 230 kV TPSS and an approximately 2.3-mile double-circuit 230 kV transmission line for Site 7—Wilson.² To support this interconnection, PG&E would need to rebuild the existing Wilson 230 kV Substation to a 4-Bay Breaker-And-A-Half within the existing fence line. Network upgrades would include expanding the El Nido Substation and reconductoring approximately 30.2 miles of existing power lines.

Table 2-3 summarizes the design features of the Avenue 21 to Road 13 Wye Alternative.

Table 2-3 Design Features of the Avenue 21 to Road 13 Wye Alternative

Feature	Avenue 21 to Road 13 Wye Alternative
Total length (linear miles) ¹	53
At-grade profile (linear miles) ¹	48.5
Elevated profile (linear miles) ¹	4
Below-grade profile (linear miles) ¹	0.5
Number of straddle bents	32
Number of railroad crossings	1
Number of major water crossings	11
Number of road crossings	58
Approximate number of public roadway closures	30
Number of roadway overcrossings and undercrossings	28
Traction power substation sites	1
Switching and paralleling stations	1 switching station, 7 paralleling stations
Signaling and train-control elements	15
Communication towers	6
Wildlife crossing structures	44

Source: Authority, 2016

¹ Lengths shown are based on equivalent dual-track alignments and are one-way mileages. For example, the length of single-track elevated structure will be divided by a factor of 2 to convert to dual-track equivalents.

2.5 SR 152 (North) to Road 11 Wye Alternative

The SR 152 (North) to Road 11 Wye Alternative would follow the existing Henry Miller Road and SR 152 rights-of-way as closely as practicable in the east-west direction, and the Road 11, SR 99, and BNSF rights-of-way in the north-south direction. Deviations from these existing transportation corridors would be necessary to accommodate design requirements; specifically, wider curves are necessary to accommodate the speed of the HSR compared to lower-speed roadway alignments. The SR 152 (North) to Road 11 Wye Alternative would not follow existing transportation rights-of-way where it transitions from following one transportation corridor to another.

² The 230 kV TPSS and approximately 0.5 mile of the 230 kV Tie-Line were previously analyzed in the Merced to Fresno Final EIR/EIS.

The SR 152 (North) to Road 11 Wye Alternative would extend approximately 51 miles, mostly at-grade on raised embankment, although it would also have aerial structures. The wye configuration of this alternative would be located west-southwest of Chowchilla, with the east-west axis along the north side of SR 152 and the north-south axis on the east side of Road 11.

The EINUs required for this alternative would include a 115 kV TPSS and switching station for Site 6—El Nido and a 230 kV TPSS and an approximately 2.3-mile double-circuit 230 kV transmission line for Site 7—Wilson.³ To support this interconnection, PG&E would need to rebuild the existing Wilson 230 kV Substation to a 4-Bay Breaker-And-A-Half within the existing fence line. Network upgrades would include expanding the El Nido Substation and reconductoring approximately 30.2 miles of existing power lines.

Table 2-4 summarizes the design features of the SR 152 (North) to Road 11 Wye Alternative.

Table 2-4 Design Features of the SR 152 (North) to Road 11 Wye Alternative

Feature	SR 152 (North) to Road 11 Wye Alternative
Total length (linear miles) ¹	51
At-grade profile (linear miles) ¹	46.5
Elevated profile (linear miles) ¹	4.5
Below-grade profile (linear miles) ¹	0
Number of straddle bents	27
Number of railroad crossings	1
Number of major water crossings	13
Number of road crossings	57
Approximate number of public roadway closures	33
Number of roadway overcrossings and undercrossings	24
Traction power substation sites	1
Switching and paralleling stations	1 switching station, 7 paralleling stations
Signaling and train-control elements	19
Communication towers	9
Wildlife crossing structures	37

Source: Authority, 2016

¹ Lengths shown are based on equivalent dual-track alignments and are one-way mileages. For example, the length of single-track elevated structure will be divided by a factor of 2 to convert to dual-track equivalents.

2.6 Avoidance and Minimization Features

The undertaking has incorporated features that would avoid or minimize effects on historical properties. The avoidance and minimization features (IAMF) inform the design of each of the Central Valley Wye alternatives in order to reduce potential adverse effects on historic properties. Measures to avoid or minimize adverse effects include steps taken in both the design and construction phases. Avoidance measures implemented during the design phase consist of identifying, and then applying conditions that would eliminate effects through redesign of components, characteristics, or construction activities that could adversely affect historic

³ The 230 kV TPSS and approximately 0.5 mile of the 230 kV Tie-Line were previously analyzed in the Merced to Fresno Final EIR/EIS.

properties. Minimization measures implemented at the design or construction phases are treatments that would reduce the degree of adverse effect or effects on historic properties.

The IAMFs that are part of the undertaking are described in Appendix B, Impact Avoidance and Minimization Features.

3 PUBLIC PARTICIPATION

3.1 Public Participation and Identification of Consulting Parties

Stipulations IV and V of the Section 106 PA set forth the procedures for public participation and involvement and for identification of consulting parties in the Section 106 process for all HSR sections. Public participation and Native American consultation is facilitated and recorded by the Authority, and is ongoing.

3.2 Public Involvement

As prescribed by Stipulation V of the Section 106 PA (Authority and FRA 2011), the public, local agencies, and other interested parties will be given the opportunity to comment on the findings of the historic properties surveys at public meetings and through review of the *California High-Speed Rail Merced to Fresno Section: Central Valley Wye Draft Supplemental Environmental Impact Report/Environmental Impact Statement* (Draft Supplemental EIR/EIS), which will be included as cultural resources appendices.

For the purposes of the Central Valley Wye, the Authority hosted community open houses and information meetings on March 20th and 21st, 2013, and January 20th and 21st, 2015. These community meetings provided the public opportunities to voice concerns regarding the Central Valley Wye alternatives, including historic resources that may be affected. Letters regarding the project section were also sent to parties potentially concerned with historic built resources. For copies of all interested and consulting parties' letters and responses, please refer to Appendix B of the ASR (Authority and FRA 2016a), and Appendix C of the HASR (Authority and FRA 2016b). Full information on the meetings and consultations that were undertaken to satisfy Section 106 and NEPA requirements can be found in Section 3.17, Cultural and Paleontological Resources, of the 2012 *Merced to Fresno Section Final EIR/EIS* (Authority and FRA 2012a) and Section 3.17, Cultural Resources, of the Draft Supplemental EIR/EIS.

3.3 Native American Consultation

Stipulation IV of the Section 106 PA identifies a separate and more formal consultation process for federally recognized Native American Tribes; however, the same level of outreach and consultation has been afforded to both federally recognized and non-federally recognized tribes. For a complete record of correspondence, see the ASR Appendix B: Correspondence (Authority and FRA 2016a).

The Authority and FRA consulted with the following tribes and will continue consultation to provide updates and information about the Central Valley Wye alternatives and to seek tribal input regarding any concerns about potential effects on important tribal cultural resources.

- Amah Mutsun Tribal Band
- Big Sandy Rancheria of Mono Indians
- California Valley Miwok Tribe
- Central Valley Yokuts
- Choinumni Tribe
- Chowchilla Tribe of Yokuts
- Cold Springs Rancheria of Mono Indians
- Dumna Wo Wah Tribal Government
- North Fork Mono Tribe
- North Fork Rancheria
- North Valley Yokuts Tribe
- Picayune Rancheria of the Chukchansi Indians (Coarsegold faction)
- Picayune Rancheria of the Chukchansi Indians (Fresno faction)
- Santa Rosa Rancheria Tachi Tribe
- Sierra Nevada Native American Coalition
- Southern Sierra Miwok Nation

- Table Mountain Rancheria
- Tule River Indian Tribe
- Wuksache Indian Tribe/Eshom Valley Band

3.4 Identification of Other Consulting/Concurring Parties

As prescribed by Stipulation V.B. of the Section 106 PA, consulting parties may include other federal, state, regional, or local agencies that may have responsibilities for historic properties and may want to review reports and findings for an undertaking within their jurisdiction. Letters were sent to local historic organizations on June 28, 2013 and on May 26, 2015, inviting them to participate as consulting parties during identification efforts. This information is summarized in Table 3-1. For a complete record of correspondence, see the Central Valley Wye HASR Appendix C: Correspondence (Authority and FRA 2016b).

Table 3-1 Efforts to Identify Other Consulting/Concurring Parties

Entity	Date of Invite Letter from Authority	Response
Merced County		
The Milliken Museum Society of Los Banos	June 28, 2013 and May 26, 2015	None
Merced County Historical Society/ Merced County Courthouse Museum	May 26, 2015	None
Madera County		
Madera County Historical Society	May 26, 2015	None
Heritage Preservation Commission, Chowchilla	June 28, 2013 and May 26, 2015	None

Source: Authority and FRA, 2016b

4 DESCRIPTION OF HISTORIC PROPERTIES, APPLICATION OF CRITERIA OF ADVERSE EFFECT, AND CONDITIONS PROPOSED

4.1 Methods

This FOE describes potential effects on unknown historic properties and effects on five known historic properties. Adverse effects were identified for unknown built and archaeological historic properties and for the Robertson Boulevard Tree Row. *Unknown historic properties include historic-age built resources that could not be surveyed because they were not accessible or visible from the public right-of-way.* These are tracked for phased identification in accordance with the PA, as well as archaeological resources that may be identified through phased identification once archaeological surveys are conducted within those portions of the APE that are not currently accessible. The Authority and FRA have developed methods that would avoid, minimize, or mitigate adverse effects on historic properties. These methods seek to address potential effects first through avoidance conditions, and then through minimization if an effect cannot be avoided (see 36 C.F.R. § 800.6). The undertaking's IAMFs are included in Appendix B.

Sections 4.2 and 4.3 include descriptions of each property, the application of the criteria of adverse effect for each property, and a description of the proposed mitigation measures for those historic properties that would be adversely affected. The undertaking's general Mitigation Measures are included in Appendix C, Mitigation Measures.

4.1.1 Description of Historic Properties

Five known historic properties are located within the APE and have the potential to be affected by the proposed undertaking. These properties have been determined eligible for inclusion in the NRHP and CRHR, or are archaeological sites that have not been evaluated and are potentially eligible for inclusion in the NRHP and CRHR. The five known historic properties are in Madera and Merced Counties, and represent prehistoric flaked stone technology, historic-era state and regional irrigation projects, and community development features. Sections 4.2 and 4.3 provide descriptions of each historic property, including character-defining features, period of significance, and a summary of significance. Representative photographs of the known built environment historic properties are also included.

Of the properties in the APE that contained buildings or structures built in 1965 or earlier, 37 properties contain historic architectural resources that were previously evaluated by the Authority and coordinated with SHPO in the Merced to Fresno Section HASR (Authority and FRA 2012b) and in the Merced to Fresno Section HPSR (Authority and FRA 2012c). A total of 180 properties were newly evaluated for the Central Valley Wye HASRs (Authority and FRA 2016b and 2016c). Four properties are eligible for listing in the NRHP and California Register of Historical Resources (CRHR): the Chowchilla Canal, the Robertson Boulevard Tree Row, the Delta-Mendota Canal, and the California Aqueduct. Of the newly evaluated resources for the Central Valley Wye alternatives, 176 built environment resources have been determined ineligible for listing in the NRHP or CRHR.

The prehistoric archaeological site WW-01 has not been evaluated due to a lack of parcel access, and is being treated as potentially eligible for inclusion in the NRHP and CRHR for the purposes of assessing Central Valley Wye alternatives effects.

In addition to known historic properties, there are archaeological and built resources that have not been evaluated because they were not accessible or visible from the public right-of-way. They are potentially eligible for inclusion in the NRHP and CRHR. These properties are also addressed in Sections 4.2 and 4.3.

Table 4-1 summarizes the historic properties and includes their CRHR Status Codes (see Appendix D, California Historical Resource Status Codes).

Table 4-1 Historic Properties and Effects Findings

Map ID No.	Resource Name	Year Built	CRHR Status Code	NRHP Criteria	Effect Findings
None	WW-01	Prehistoric	7R	D	No Effect
None	Unknown archaeological historic properties	N/A	N/A	N/A	Potential adverse effect
197	Chowchilla Canal	1872	3S	A	No Adverse Effect
423	Robertson Boulevard Tree Row	1912	2S2	A / C	Adverse Effect - Direct
None	Delta-Mendota Canal	1946 to 1951	2B	A	No Effect
None	California Aqueduct	1960 to 1974	3	A	No Effect
Various	Unknown built environment historic properties (67 parcels inaccessible for survey)	N/A	N/A	N/A	Potential adverse effect

Source: Authority and FRA, 2016b, 2016c
 CRHR = California Register of Historical Resources
 NRHP = National Register of Historic Properties

4.1.2 Criteria of Adverse Effect

In accordance with Stipulation VII of the Section 106 PA, the Authority and FRA applied the Criteria of Adverse Effect (36 C.F.R. § 800.5) to the actions that have the potential to affect the historic properties within the APE. An “adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.”

Application of the criteria of adverse effect is an assessment of an undertaking’s changes to the character or use of a historic property and about how an undertaking will affect those features of a historic property that contribute to its eligibility for listing in the NRHP. Effects can be direct, indirect, and cumulative. Direct effects include such actions as physical destruction or damage. Indirect effects include the introduction of visual elements or noise or vibration and can include the neglect of a historic property or cumulative effects. Cumulative effects are the effects of the current undertaking taken into account with known past, present, or foreseeable future projects.

4.1.3 Conditions Proposed for Avoiding, Minimizing, or Mitigating Adverse Effects on Historic Properties

The general conditions and treatments (avoidance, minimization, and mitigation), presented in this FOE were stipulated in the Merced to Fresno Section MOA. Most treatment measures will be implemented before the commencement of construction activities; however, depending on the nature of the selected measures, some treatments may not be completed until after construction of the undertaking is completed.

The ATP and BETP identify conditions and treatments for as yet unsurveyed built and archaeological resources. The ATP prepared for the Merced to Fresno Section directs the additional identification and effects assessment and outlines mitigation for adverse effects. It will be amended to include archaeological sensitivity mapping for the Wye APE. The BETP for the Merced to Fresno Section includes detailed direction for implementation of conditions and

treatments for the Robertson Boulevard Tree Row (Map ID 423). It will be amended to include the requirement that the Authority direct the design-builder to make efforts to reduce the number of trees affected as much as possible. This minimization effort will be described in detail in the BETP, including design review requirements in consultation with the SHPO. Additionally, should any of the built resources requiring phased identification be found to be eligible and adversely affected by the project, the Authority will amend the BETP. Associated property-specific mitigation will be developed in consultation with SHPO. The Central Valley Wye alternative IAMFs are presented in Appendix B and mitigation measures in Appendix C.

4.2 Archaeological Historic Properties

4.2.1 Archaeological Site WW-01

Map ID: None

Location: Merced County

4.2.1.1 Property Description

WW-01 is a very sparse prehistoric lithic scatter of eight percussion flakes distributed across a 38-meter by 10-meter area at the edge of an orchard. Per the Section 106 PA (Stipulation VI. C.1, Authority and FRA 2011), WW-01 is assumed eligible for listing in the NRHP under Criterion D and the CRHR under Criterion 4.

The landform is part of a dune complex to the north of the Merced River, and soils consist of fine sand with sparse grasses growing between the orchard rows. The site overlooks an undeveloped grassland and a small drainage approximately 100 meters to the north, and has a 5-6° slope with good ground surface visibility (80%). Four of the recorded flakes are primary reduction flakes (three quartzite and one meta-volcanic), one is a secondary flake (quartzite), one is a simple interior percussion flake (meta-volcanic), one is an early biface thinning flake (chert), and one is a flake fragment (quartzite). These materials are consistent with early-stage lithic reduction. No other prehistoric artifacts or features (e.g., groundstone, midden, fire-affected rock, hearths, housepits) were noted at WW-01, and the site may represent a short-term lithic activity area. An unnamed dirt access road lies immediately to the north of the site, and an existing PG&E tower stands approximately 10 meters to the southeast. The transmission alignment passes over the site and trends northwest into the grassland. The previous construction and maintenance of the transmission alignment and dirt road, coupled with agricultural activities, have likely disturbed or redistributed cultural materials at WW-01.

The location of archaeological site WW-01 is confidential.

4.2.1.2 Application of Criteria of Adverse Effects: No Effect

The property is located in an area proposed for the EINU. WW-01 intersects the APE at the Warnerville–Wilson 230 kV reconductor alignment as well as an existing dirt access road. Improvements to the road in the immediate vicinity of the site are not anticipated, and a pole or structure work area within the reconductor alignment was relocated during planning to avoid the resource.

Archaeological site WW-01 is located within the Central Valley Wye archaeological APE in all alternatives. None of the Central Valley Wye alternatives would affect this historic property. Specifically, proposed reconductoring would not cause ground disturbance within the boundaries of the resource, therefore the undertaking would not affect the potential for the resource to yield data important to the prehistory of the region.

4.2.2 Unknown Archaeological Historic Properties

Map ID: None

Location: Merced and Madera Counties

4.2.2.1 Property Description

Although only one archaeological site was identified in the APE during the field survey or through the record search, fully half of the APE remains unsurveyed due to lack of access, and sensitive for archaeological resources. Based on geoarchaeological analysis, 50 percent of the archaeological APE is within areas that are defined as having high archaeological sensitivity and 50 percent is within areas considered as having low archaeological sensitivity. Numerous water crossings—notably the Chowchilla River and Ash Slough—indicate favorable locations for villages and more temporary encampments. Potential resources may be surface deposits, visible within ploughed fields or along dried drainages.

Unknown or unrecorded archaeological resources may exist in unsurveyed areas, within the urbanized or rural areas, where permission to enter has not been granted. Additionally, buried archaeological resources may be located on lands that were surveyed, but the resources were not visible during survey as no artifacts or other cultural constituents were visible on the ground surface. Unknown archaeological sites might represent the full range of prehistoric or historic activities conducted over time, including prehistoric lithic scatters and village sites, historic-era homestead remains, and human burials. The potential for encountering archaeological resources is the same for all alternatives, since the survey coverage and the cultural sensitivity for all four is the same. All alternatives would have similar amounts of ground disturbance; therefore, each alternative has the same potential to disturb or damage unknown archaeological resources during construction.

4.2.2.2 Application of Criteria of Adverse Effects: Potential Adverse Effect

The undertaking could cause physical destruction of or damage to all or part of unknown historic properties pursuant to NHPA (36 C.F.R. § 800.5). Unknown archaeological resources are potentially eligible for inclusion in the NRHP. The *California High-Speed Train Merced to Fresno Section Memorandum of Agreement (MOA)* and *California High-Speed Train Merced to Fresno Section Memorandum of Agreement Attachment 2 Archaeological Treatment Plan (ATP)* (Authority and FRA 2013b, 2013c) stipulate and describe approved procedures for phased identification and treatment of unknown historic properties.

As described in the Central Valley Wye alternatives project description, the undertaking includes impact avoidance features that limit the potential for adverse effects to occur on unknown archaeological sites. The Authority anticipates that the Merced to Fresno Section ATP will be amended for the Central Valley Wye alternatives. The Authority and SHPO will use the existing MOA and the amended ATP to enforce the implementation of required actions that arise from consultation for the undertaking. The Authority will also conduct pre-construction surveys of all areas not previously surveyed as access is granted, prior to any ground disturbing activities. These surveys would identify surface evidence of archaeological resources that may be analyzed for avoidance, therefore reducing the potential for impact on historic properties. This effort would include creation of a geospatial layer to identify the locations of all known archaeological and built historic architectural resources, which would be used to develop an archaeological monitoring plan and allows for the relocation of access areas and laydown sites if their proposed location has the potential to affect newly discovered archaeological sites or historic architectural resources.

Additionally, a worker environmental awareness program (WEAP) requires that a training session and printed material to be presented to construction personnel to familiarize the workforce with the relevant legal context for cultural resources and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. These training sessions are intended to enable construction personnel to identify a resource that may be archaeological and follow procedures for facilitating resource determinations and treatment plan applications, thereby reducing the potential effect on resources identified during construction. Monitoring requirements include preparation and implementation during construction of an Archaeological Monitoring Plan for archaeologically sensitive areas that would further reduce the potential to disturb archaeological materials. However, even with these measures, the undertaking could disturb and damage archaeological materials.

4.3 Built Environment Historic Properties

4.3.1 Chowchilla Canal



South of SR 152; view north
Map ID: 197

Taken: 4/27/2012
Location: Vicinity of Chowchilla

Figure 4-1 Chowchilla Canal

4.3.1.1 Property Description

The Chowchilla Canal (Figure 4-1) was built in 1872 by Miller & Lux and W. S. Chapman. The entire canal is approximately 24 miles long, 8 feet wide at the top, and 5 feet deep, with a bottom surface that is V-shaped. The Chowchilla Canal was one of the first large-scale canals constructed in the region and was central to an extensive water conveyance system managed by Miller & Lux. The canal carries water northward from the San Joaquin River at Mendota to its terminus just shy of the Chowchilla River. Originally constructed as an earthen canal, large segments of the Chowchilla Canal were later lined with concrete.

The Chowchilla Canal is eligible for listing in the NRHP at the local level of significance under NRHP Criterion A and, consequently eligible for listing in the CRHR under Criterion 1 for its association with an extensive, early irrigation system that transformed the development of agriculture in the San Joaquin Valley. The canal's character defining features are its historic alignment, its agricultural setting, and its historic function as a water conveyance feature. The segment of the canal in the APE is concrete-lined and is approximately 3 miles long, of which approximately 1 mile has been converted to underground pipe. This segment of the canal largely maintains its historic alignment, despite changes to its materials and form. The NRHP and CRHR historic property boundary is the canal structure and its right-of-way (which varies along the length of the system but generally includes the canal structure plus adjacent maintenance access roads).

Overall, this segment of the canal system continues to convey its significance as one of the first large-scale canals constructed in the region through its on-going function as a water conveyance system that is located in historical alignment within an agricultural setting. As such, the historic property's integrity of association, location, and setting have been retained.

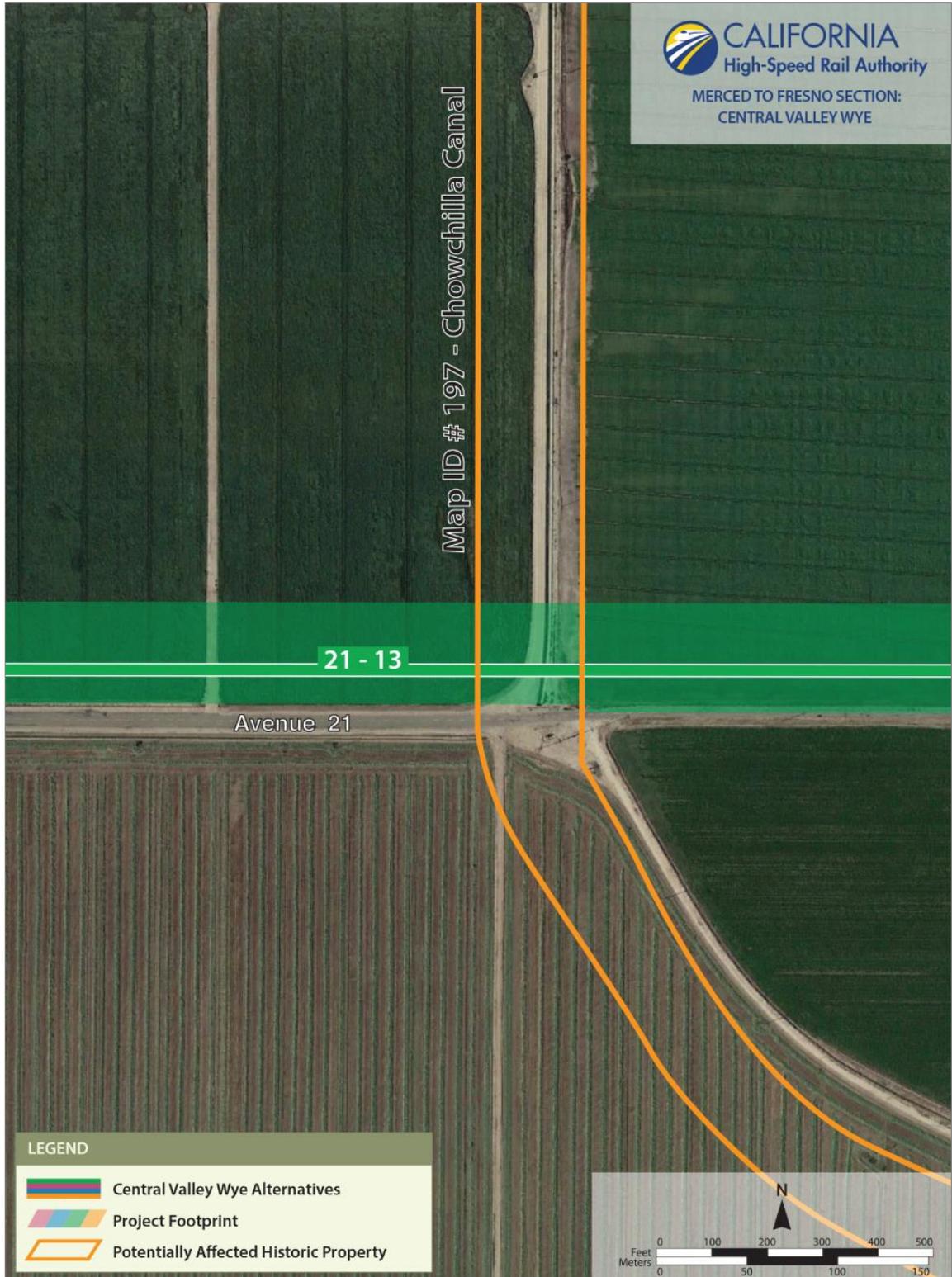
Figures 4-2a and 4-2b depict the Chowchilla Canal in relationship to the project footprint of each of the Central Valley Wye alternatives. The resource occurs within the project footprint for all Central Valley Wye alternatives.



Source: Authority and FRA, 2016c

FINAL- JUNE 15, 2017

Figure 4-2a Chowchilla Canal



Source: Authority and FRA, 2016c

FINAL - JUNE 15, 2017

Figure 4-2b Chowchilla Canal

4.3.1.2 Application of Criteria of Adverse Effects: No Adverse Effect

All of the Central Valley Wye alternatives would be constructed across the Chowchilla Canal, a significant historic architectural resource, and would require modification of the canal. While each alternative would cross the canal in a different place, the types of construction activities would be the same, and each alternative would result in approximately the same types of effects. The result of construction would not cause an adverse effect on this existing historic architectural resource or its setting under any of the alternatives because the modification of this historic property would not impair its ability to convey its historical significance.

SR 152 (North) to Road 13 Wye Alternative

Construction of the SR 152 (North) to Road 13 Wye Alternative would result in the removal of the existing culvert under SR 152 and installation of a new culvert to carry the Chowchilla Canal segment under both the road and the proposed adjacent rail alignment. The Chowchilla Canal would not be realigned, but rather the existing culverted section would be extended to accommodate the HSR and would continue to convey water along its historical alignment.

Historic canals can be adversely affected by activities such as reconstruction of an earthen feature into a channelized feature, relocation of a segment of canal, or decommissioning a segment from continued use. The Chowchilla Canal is already culverted at the road crossing because of previous reconfigurations of the system. The new rail alignment would parallel the existing road and the reconfiguration of the canal would simply be another modification of the existing culverted section. Therefore, the Chowchilla Canal would retain its character-defining features that enable the resource to convey its historic significance including its historical alignment, its ability to transport water and maintain its association with its historical use, and its agricultural setting.

SR 152 (North) to Road 19 Wye Alternative

The SR 152 (North) to Road 19 Wye Alternative would cross the Chowchilla Canal in the same location as the SR 152 (North) to Road 13 Wye Alternative and would require the same construction activities. The alternative would involve the reconfiguration of a culvert that currently carries the Chowchilla Canal under SR 152 to accommodate both the road and the proposed rail alignment. The effects would be the same as the SR 152 (North) to Road 13 Wye Alternative.

Avenue 21 to Road 13 Wye Alternative

Construction activities for this alternative would be the same as the construction activities described for the SR 152 (North) to Road 13 Wye Alternative, although the location of the crossing would be different. The Avenue 21 to Road 13 Wye Alternative would involve the reconfiguration of a culvert that currently conveys the Chowchilla Canal under Avenue 21 to accommodate both the road and the proposed rail alignment. The effects would be approximately the same as those for the SR 152 (North) to Road 13 Wye Alternative due to the same activities taking place but would occur in a different location.

SR 152 (North) to Road 11 Wye Alternative

The SR 152 (North) to Road 11 Wye Alternative would cross the Chowchilla Canal in the same location as the SR 152 (North) to Road 13 Wye Alternative and would require the same construction activities. To accommodate both the road and the proposed rail alignment, the alternative would involve the reconfiguration of a culvert that currently carries the Chowchilla Canal under SR 152. The effects would be the same as for the SR 152 (North) to Road 13 Wye Alternative.

Electrical Interconnections and Network Upgrades

The Chowchilla Canal is located in the APE in an area proposed for the EINU. Within the historic architectural APE, there is no potential for direct or indirect effects on historic properties associated with all of the Central Valley Wye alternatives. The proposed reconductoring consists of overhead utilities installation and upgrades at the Chowchilla Canal, and therefore the

reconductoring would not affect the alignments or appearances of this built resource and it would retain its character-defining features that enable the resource to convey its historic significance.

4.3.2 Robertson Boulevard Tree Row



Robertson Boulevard south of SR 152; view south west
Map ID: 423

Taken: 7/18/2016
Location: Chowchilla

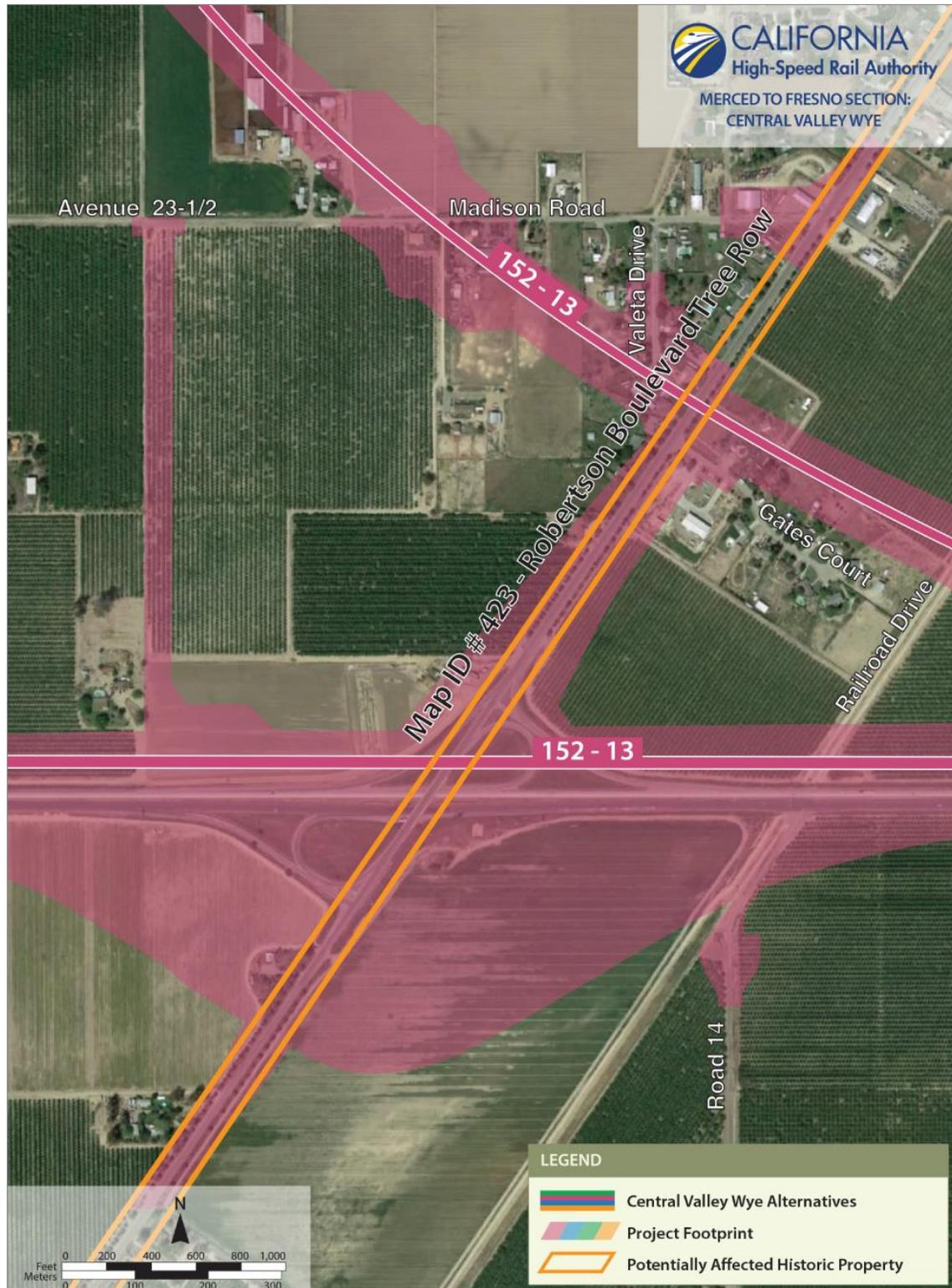
Figure 4-3 Robertson Boulevard Tree Row

4.3.2.1 Property Description

The Robertson Boulevard Tree Row (Figure 4-3) was designated a California Point of Historical Interest in 1989. On March 13, 2012, the resource was determined eligible for listing in the NRHP and CRHR by the FRA and received concurrence from the SHPO, as part of the Merced to Fresno Section of the HSR system. The tree row consists of Canary Island palms, short Mexican fan palms, and oleanders that Orlando Robertson, founder of Chowchilla, planted in 1912 as part of the marketing efforts to attract settlers, specifically farmers, to the area. The row of trees is a recognizable landmark and has a direct association with the initial development of Chowchilla. As such, this resource meets NRHP Criterion A and CRHR Criterion 1 in the area of community development and NRHP Criterion C and CRHR Criterion 3 in the area of landscape architecture. Essential character-defining features of the Robertson Boulevard Tree Row that enable the resource to convey its significance are its historical alignment, the combination of plant types, and its visibility as a recognizable landmark in Chowchilla. The NRHP and CRHR historic property boundary is the tree row and the public right-of-way of Robertson Boulevard.

The 1989 documentation of the Robertson Boulevard Tree Row characterized the length of the resource as 11 miles. Recent investigations on the existing tree row reveal that it extends along both sides of a 9.4-mile stretch of Robertson Boulevard (SR 233) which is an approximately 100-foot-wide two-lane road. The northern portion of the tree row begins at the intersection of Robertson Boulevard and SR 99 (SR 233 exit off SR 99). From that point, the tree row runs through the downtown core of Chowchilla and continues for several miles southwest through a more rural area of the town until its terminus at Avenue 18 1/2. The expansion of SR 152 in the mid-1960s resulted in creating an approximate 1,700-foot gap in the tree row. Although a visually prominent feature of the Chowchilla landscape, including roughly 1,000 trees, the row of palms is not contiguous, and fluctuates between dense stretches of evenly spaced trees, and more sporadic unevenly spaced trees.

Figures 4-4a through 4-4f depict the Robertson Boulevard Tree Row in relationship to the project footprint for each of the Central Valley Wye alternatives. The resource occurs within the project footprint for all Central Valley Wye alternatives.



Source: ESRI, 2013; CAL FIRE, 2004; ESRI/National Geographic, 2015; Google Earth, 2015

FINAL - JUNE 15, 2017

Figure 4-4a Robertson Boulevard Tree Row



Source: ESRI, 2013; CAL FIRE, 2004; ESRI/National Geographic, 2015; Google Earth, 2015

FINAL - JUNE 15, 2017

Figure 4-4b Robertson Boulevard Tree Row



Source: ESRI, 2013; CAL FIRE, 2004; ESRI/National Geographic, 2015; Google Earth, 2015

FINAL - JUNE 15, 2017

Figure 4-4c Robertson Boulevard Tree Row



Source: ESRI, 2013; CAL FIRE, 2004; ESRI/National Geographic, 2015; Google Earth, 2015

FINAL - SEPTEMBER 10, 2017

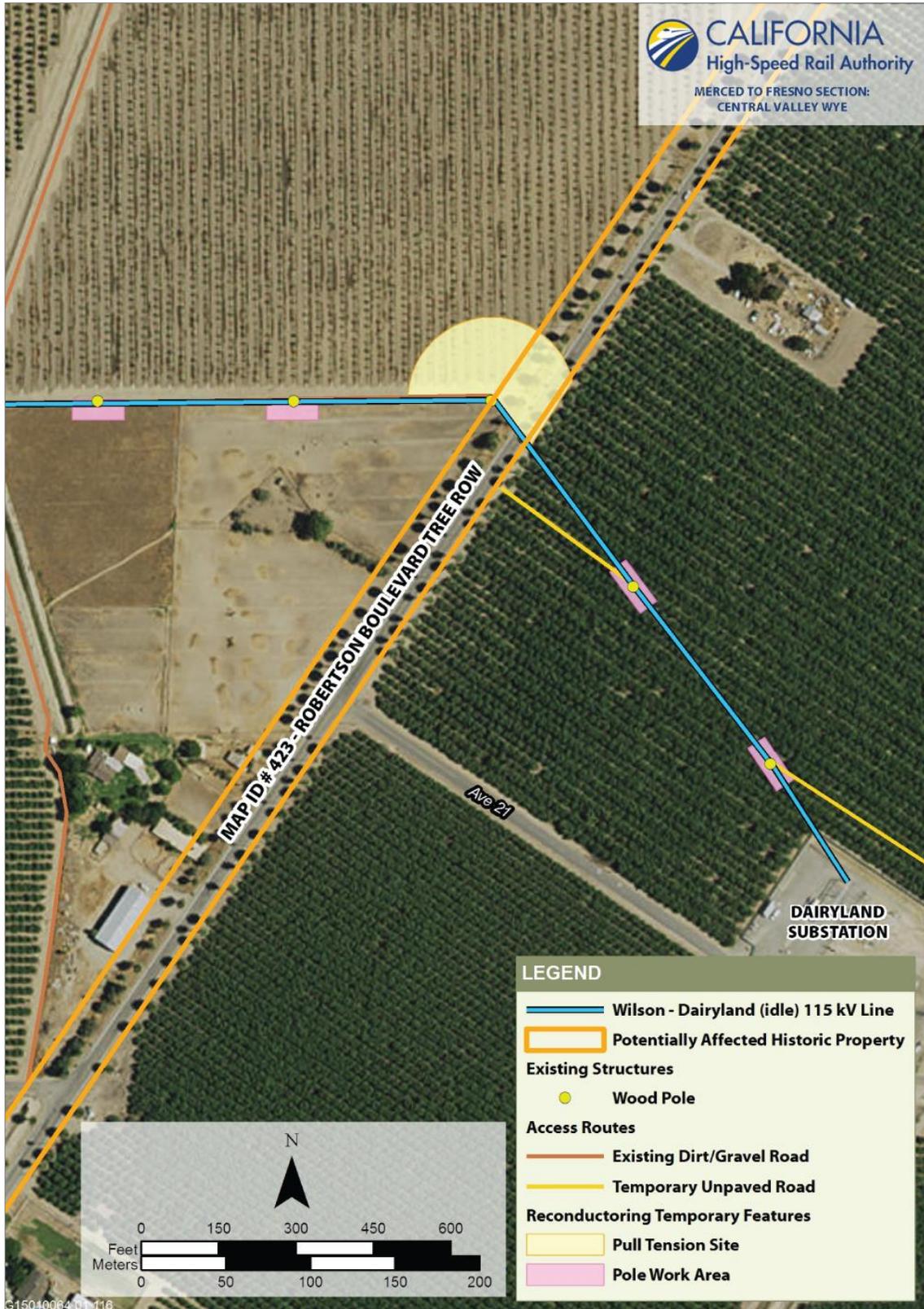
Figure 4-4d Robertson Boulevard Tree Row



Source: ESRI/National Geographic, 2015

FINAL - SEPTEMBER 10, 2017

Figure 4-4e Robertson Boulevard Tree Row



Source: ESRI/National Geographic, 2015

FINAL - JULY 6, 2017

Figure 4-4f Robertson Boulevard Tree Row

4.3.2.2 Application of Criteria of Adverse Effects: Adverse Effect

The original Merced to Fresno Final EIR/EIS (Authority and FRA 2012a) concluded that the Robertson Boulevard Tree Row would be adversely affected as a result of each of the alternatives analyzed as part of that evaluation. Both the Avenue 21 Wye and Avenue 24 Wye alternatives analyzed in that document would cross the tree row perpendicularly, resulting in the physical demolition, destruction, damage, or substantial alteration of the Robertson Boulevard Tree Row.

As part of the undertaking's analysis for the Central Valley Wye alternatives, the Robertson Boulevard Tree Row was analyzed for potential impacts under each of the Central Valley Wye alternatives under consideration. The analysis determined that the impacts would be comparable to those disclosed in the Merced to Fresno Final EIR/EIS. Although the alignments of the wye alternatives analyzed in the Merced to Fresno Final EIR/EIS and the Central Valley Wye alternatives differ, the effects resulting from the Robertson Boulevard Tree Row crossing would be similar. Consequently, the adverse effect finding for the current undertaking would be the same.

SR 152 (North) to Road 13 Wye Alternative

Under the SR 152 (North) to Road 13 Wye Alternative, the alignment would cross Robertson Boulevard at two locations—the San Jose to Fresno leg would cross Robertson Boulevard just north of the SR 152 interchange, while the Merced to Fresno leg would cross Robertson Boulevard on an aerial structure at the Valeta Drive intersection approximately 0.4 mile north of SR 152. Effects on the Robertson Boulevard Tree Row resulting from the placement of HSR track would include removing approximately six trees for the Merced to Fresno leg of the Central Valley Wye alternative, and no trees exist along SR 152 near the San Jose to Fresno leg. However, because the San Jose to Fresno leg would be placed at-grade in this location, Robertson Boulevard would be grade-separated by building an underpass below the Central Valley Wye track to maintain circulation along Robertson Boulevard. Because a substantial number of trees were previously removed to construct the existing Robertson Boulevard grade separation at SR 152, a portion of the area that would be affected by this Central Valley Wye alternative is already absent of trees. However, construction of the grade-separated Robertson Boulevard would result in the removal of additional trees of the Robertson Boulevard Tree Row.

In total, the SR 152 (North) to Road 13 Wye Alternative would result in the removal of approximately 170 individual trees associated with 6,250 linear feet of the project footprint. Because a portion of the Robertson Boulevard Tree Row would be permanently incorporated into the project footprint for this Central Valley Wye alternative, resulting in the destruction of a portion of this historic resource, the SR 152 (North) to Road 13 Wye Alternative would result in an adverse effect on the Robertson Boulevard Tree Row for the undertaking.

SR 152 (North) to Road 19 Wye Alternative

The SR 152 (North) to Road 19 Wye Alternative would result in similar impacts on the Robertson Boulevard Tree Row to those of the SR 152 (North) to Road 13 Wye Alternative. Specific to the SR 152 (North) to Road 19 Wye Alternative, an electrical network upgrade would traverse Robertson Boulevard Tree Row.

The key difference between the SR 152 (North) to Road 19 Wye Alternative and SR 152 (North) to Road 13 Wye Alternative is that the Merced to Fresno leg of this alternative would not cross Robertson Boulevard. However, the San Jose to Fresno leg and associated grade separation of Robertson Boulevard would still result in the removal of a substantial number of palm trees and the overall number of trees removed would be approximately identical to that of the SR 152 (North) to Road 13 Wye Alternative. In total, the SR 152 (North) to Road 19 Wye Alternative would result in the removal of approximately 170 trees associated with 6,175 linear feet of the project footprint. Because a portion of the Robertson Boulevard Tree Row would be permanently incorporated into the project footprint of this Central Valley Wye alternative, resulting in the destruction of a portion of this historic resource, the SR 152 (North) to Road 19 Wye Alternative would result in an adverse effect on the Robertson Boulevard Tree Row for the undertaking.

Avenue 21 to Road 13 Wye Alternative

The Avenue 21 to Road 13 Wye Alternative would have similar impacts on the Robertson Boulevard Tree Row to those of the SR 152 (North) to Road 13 Wye Alternative. Specifically, the San Jose to Fresno and Merced to Fresno legs of this alternative would cross Robertson Boulevard and the associated historic tree row, but in a different location, approximately 0.9 mile south of SR 152. The Merced to Fresno leg would cross Robertson Boulevard on an aerial structure just north of Avenue 22 and would result in the removal of approximately two or three trees associated with the Robertson Boulevard Tree Row. As with the other alternatives, the San Jose to Fresno leg would cross Robertson Boulevard perpendicularly and would require grade separating Robertson Boulevard, resulting in the removal of a substantial number of trees. This portion of the existing Robertson Boulevard Tree Row is more intact than the portions that would be affected under the SR 152 (North) to Road 13 and SR 152 (North) to Road 19 Wye Alternatives because there have been fewer trees removed by previous projects, and therefore a greater number of trees would be affected. No portion of Robertson Boulevard is grade separated in this area, as is the case at the SR 152 interchange.

Accordingly, the Avenue 21 to Road 13 Wye Alternative would result in the removal of approximately 260 trees associated with 5,500 linear feet of the project footprint. Because a portion of the Robertson Boulevard Tree Row would be permanently incorporated into the project footprint of this Central Valley Wye alternative, resulting in the destruction of a portion of this historic resource, the Avenue 21 to Road 13 Wye Alternative would result in an adverse effect on the Robertson Boulevard Tree Row for the undertaking.

SR 152 (North) to Road 11 Wye Alternative

The SR 152 (North) to Road 11 Wye Alternative would result in similar effects on the Robertson Boulevard Tree Row to those of the SR 152 (North) to Road 19 Wye Alternative. Under both alternatives, the San Jose to Fresno leg and associated grade separation of Robertson Boulevard would result in the removal of a substantial number of palm trees, although the SR 152 (North) to Road 11 Wye Alternative would disturb slightly fewer linear feet of tree row because of the grade separation. The SR 152 (North) to Road 11 Wye Alternative would result in the removal of approximately 160 trees associated with 5,825 linear feet of the project footprint. Because a portion of the Robertson Boulevard Tree Row would be permanently incorporated into the project footprint of this Central Valley Wye alternative, resulting in the destruction of a portion of this historic resource, the SR 152 (North) to Road 11 Wye Alternative would result in an adverse effect on the Robertson Boulevard Tree Row for the undertaking.

Electrical Interconnections and Network Upgrades

Reconductoring/rebuilding of the existing Site 7—Le Grand Junction/Sandy Mush Road, Wilson–Dairyland (idle) 115 kV power line (which crosses the Robertson Boulevard Tree Row near Avenue 21 approximately 4 miles southwest of Chowchilla), would require a temporary pull and tension site. This pull and tension site area bisects a small portion of the Robertson Boulevard Tree Row. This could require the removal of one or more of the trees associated with the Robertson Boulevard Tree Row. However, the actual footprint of the pull and tension sites would be smaller than the pull and tension areas evaluated in this document. A larger impact area is evaluated to allow flexibility during construction. As described in the EINU HASR (Authority and FRA 2016c) the pull and tension site would be located so as not to disturb, remove, or in any way affect the protected resources associated with Robertson Boulevard Tree Row. Therefore, the Robertson Boulevard Tree Row would not be adversely affected by the reconductoring. Additionally, once constructed, the Wilson–Dairyland (idle) 115 kV power line would operate the same as existing conditions.

4.3.2.3 Conditions Proposed

As part of the analysis for the undertaking, the Authority analyzed the Robertson Boulevard Tree Row for potential effects under each of the Central Valley Wye alternatives. The Authority has

revisited the treatment measures for the Robertson Tree Row in the Merced – Fresno BETP and will amend the BETP, in consultation with the MOA signatories and consulting parties. The amendment will include measures requiring the Authority to ensure that the design/build contractor removes as few trees as possible, in consultation with SHPO as plans are developed.

The findings of effect for the Merced to Fresno and Central Valley Wye alternative undertakings included differing conclusions for the undertakings' effects on the NRHP status of the Robertson Boulevard Tree Row. The assessment conducted for the Merced to Fresno Section alternatives (Authority and FRA 2012e) concluded that the undertaking's adverse effects on the Robertson Boulevard Tree Row would cause loss of integrity and affect the resource's ability to convey its historic significance, resulting in the Robertson Boulevard Tree Row no longer being eligible for listing in the NRHP. The assessment conducted for the Central Valley Wye alternatives concludes that the resource's character-defining features, integrity, and ability to convey its historic significance would be adversely affected, but would not result in a loss of eligibility. As concurred by the SHPO in the HASR (November 18, 2016; see Appendix A), the character-defining features of the Robertson Boulevard Tree Row that enable the property to convey its significance are its historical alignment, the combination of plant types, and its visibility as a recognizable landmark in Chowchilla. The current analysis concludes that the adverse effects would not affect the integrity of the property's character-defining features and associations with its historic era themes and era of significance to the level that any of the Central Valley Wye alternatives would prevent the property from continuing to convey its historic significance.

4.3.3 Delta-Mendota Canal

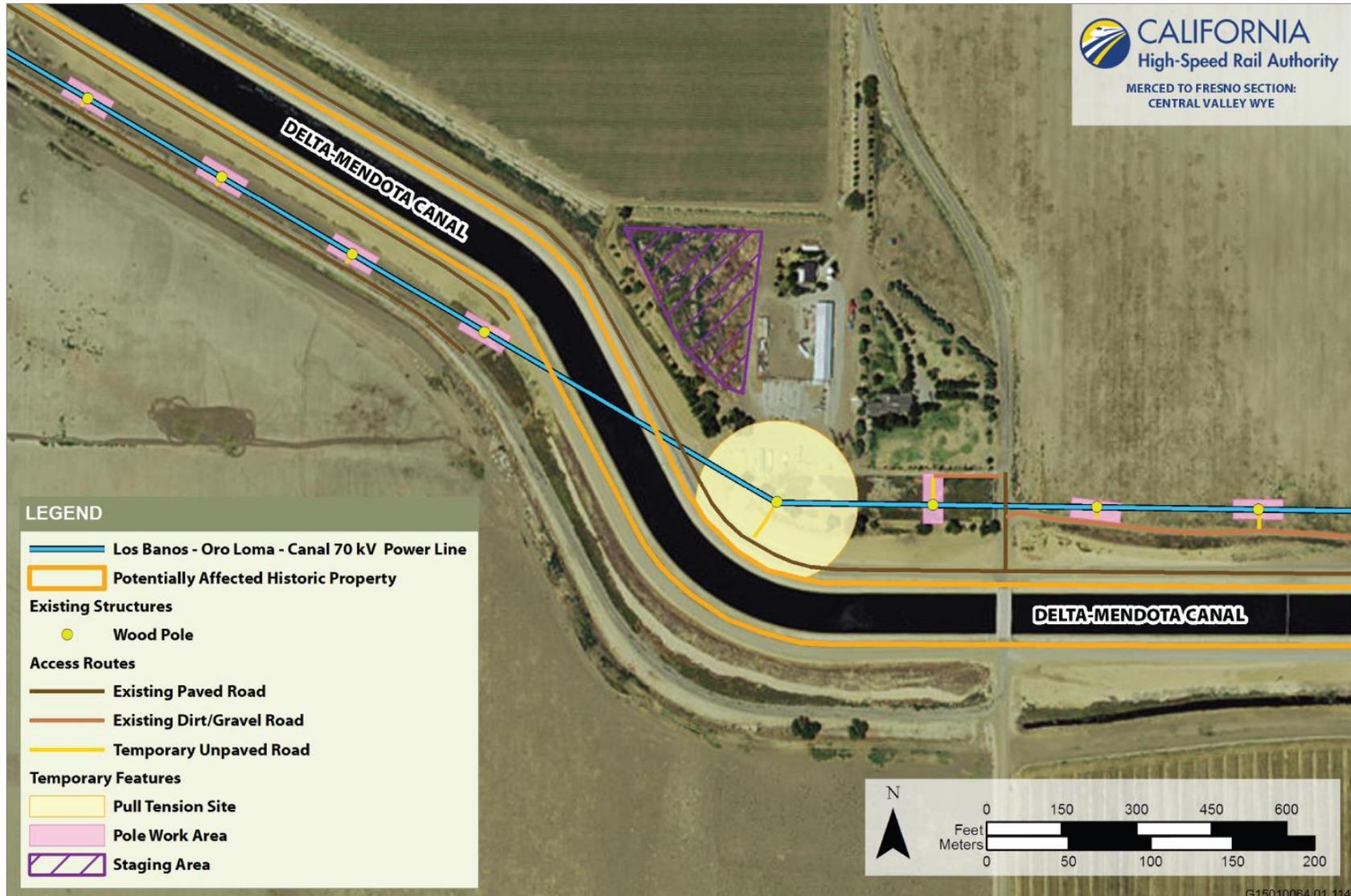
Map ID: None

Location: Merced County

4.3.3.1 Property Description

The Delta-Mendota Canal is one of the main canals of the Central Valley Project (CVP), a Depression-era water development project in which the U.S. Bureau of Reclamation transformed the water storage and conveyance systems of the Sacramento and San Joaquin Valleys. The canal conveys water from the Tracy Pumping Plant located in the Sacramento-San Joaquin Delta, carrying it south to the Mendota Pool where it replenishes water diverted from the San Joaquin River by the Friant-Kern Canal. The canal was the third of the CVP canals built by the U.S. Bureau of Reclamation beginning in 1946 and completed in 1951. The canal is a trapezoidal concrete-lined canal approximately 120 feet wide and 110 miles long. The CVP was a major engineering project to reduce flooding and redistribute water throughout California. The main canals associated with the CVP form the backbone of the system, conveying and delivering water to users, and are the primary means of water redistribution. The Delta-Mendota Canal was found individually eligible for inclusion in the NRHP under Criterion A in 2000 and is listed in the CRHR under Criterion 1. The segments within the APE retain their historical alignment and appearance and are able to convey their historical significance within the CVP system. The NRHP and CRHR historic property boundary is the canal structure and its right-of-way.

Figures 4-5a and 4-5b depict the Delta-Mendota Canal in relationship to the project footprint for each of the Central Valley Wye alternatives. The resource occurs within the project footprint for all Central Valley Wye alternatives.



Source: ESRI/National Geographic, 2015

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Figure 4-5a Delta-Mendota Canal



Source: ESRI/National Geographic, 2015

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Figure 4-5b Delta-Mendota Canal

4.3.3.2 Application of Criteria of Adverse Effects: No Effect

The property is located in an area proposed for the EINU. The Delta-Mendota Canal is crossed twice by the existing Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV power line proposed to be reconductored for all Central Valley Wye alternatives. No further study of the canal was required for the EINU because reconductoring the existing Los Banos—Oro Loma—Canal 70 kV Power Line that crosses over the canal does not pose any potential direct or indirect effects on the canal as a historic property.

The character-defining features of the canal are its historical alignment and its ability to convey water as part of a large-scale water conveyance system. There is no potential for direct or indirect effects on the Delta-Mendota Canal. Specifically, proposed reconductoring would not affect the alignment or function of this built resource because it would span the canal. The canal would retain its character-defining features that enable the resource to convey its historic significance.

4.3.4 California Aqueduct

Map ID: None

Location: Merced County

4.3.4.1 Property Description

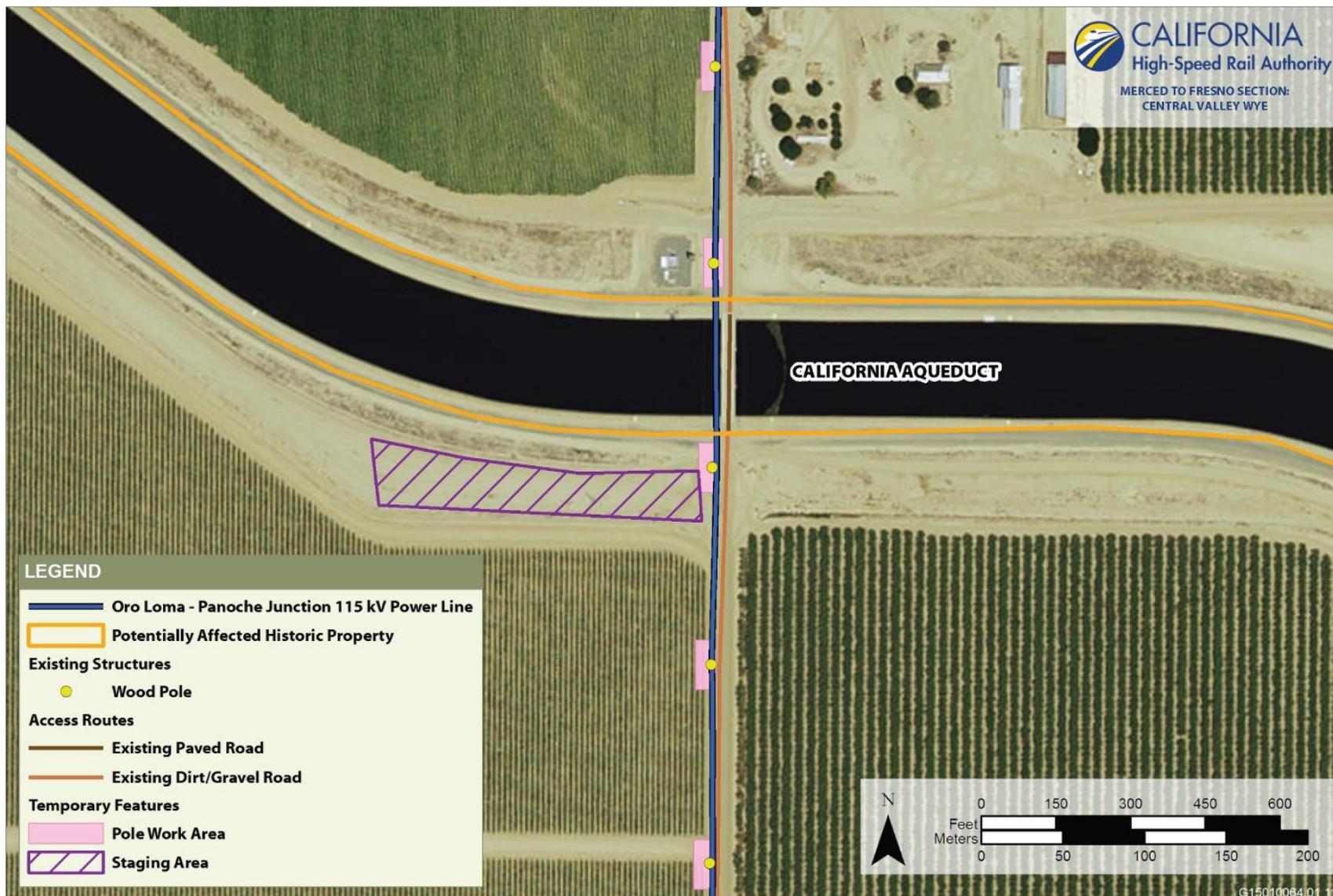
The California Aqueduct has been evaluated by previous studies that concluded it meets the criteria for listing in the NRHP under Criteria A and the CRHR under Criteria 1. The California Aqueduct is a major engineering accomplishment conveying water from the Sacramento-San Joaquin Delta to Lake Perris in Riverside County. Divided into five segments, the main line of the aqueduct is 444 miles long and is a concrete-lined canal with wide earthen bands supporting roadways on each side. The California Department of Water Resources began construction of the canal in 1960 and completed it in 1974. The California Aqueduct was one of the components of the State Water Project that retained Feather River water at Oroville and released it to the Sacramento-San Joaquin River Delta where it was then pumped into the California Aqueduct for distribution to the south. This segment is regularly maintained and retains its ability to convey the historical significance of the aqueduct. The NRHP and CRHR historic property boundary is the canal structure, its associated infrastructure such as bridges and pump stations, and its right-of-way.

Figure 4-6 depicts the California Aqueduct in relationship to the project footprint for each of the Central Valley Wye alternatives. The resource occurs within the project footprint for all Central Valley Wye alternatives.

4.3.4.2 Application of Criteria of Adverse Effects: No Effect

The California Aqueduct is located in an area proposed for the EINU. The existing Site 6—El Nido, Oro Loma—Panoche Junction 115 kV power line, proposed to be reconductored for all Central Valley Wye alternatives, crosses the California Aqueduct in the San Luis Unit which is 25–37 feet deep and 50–110 feet wide. No further study of the canal is required because EINU reconductoring for the existing Oro Loma—Panoche Junction 115 kV Power Line that crosses over the canal does not pose any potential direct or indirect effects.

The California Aqueduct is located in the APE. The character-defining features of the canal are its historical alignment and its ability to convey water as part of a large-scale water conveyance system. There is no potential for direct or indirect effects on the California Aqueduct. Specifically, proposed reconductoring would not affect the alignment or function of this built resource because it would span the canal. The canal would retain its character-defining features that enable the resource to convey its historic significance.



Source: ESRI/National Geographic, 2015

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Figure 4-6 California Aqueduct

4.3.5 Unsurveyed Built Historic Properties

Map ID: Assorted

Location: Merced and Madera Counties

A portion of the built environment APE was not surveyed due to access restrictions. As part of the undertaking, and in keeping with Stipulation VI.E, a survey of the APE for the preferred alternative will be completed through phased identification. Therefore, currently unknown built historic properties may be located in unsurveyed portions of the APE and adversely affected by the undertaking.

4.3.5.1 *Application of Criteria of Adverse Effects: Potential Adverse Effect*

The undertaking could cause destruction of or damage to all or part of unknown built historic properties pursuant to NHPA (36 C.F.R. § 800.5). Built resources located on parcels not yet inventoried due to access restrictions during the environmental review process are potentially eligible for inclusion in the NRHP. The BETP describes approved procedures for phased identification and treatment of unknown historic properties.

The Authority will conduct pre-construction surveys of areas within the APE for the preferred alternative not previously surveyed due to lack of legal access once access is granted, and before any construction activities commence. These surveys would identify built environment resources that are eligible for inclusion in the NRHP and require consultation to identify measures to avoid, minimize, or mitigate adverse effects.

4.4 Operations Effects

Operations activities would have no effect on the types of historic properties located within the APE. The operations and maintenance of all four Central Valley Wye alternatives are not expected to result in further ground disturbance, visual discord, or vibration that would cause additional impacts on archaeological resources. Likewise, the types of architectural historic properties located in the APE (trees and canals) are not susceptible to physical impacts from operations since the vibration levels would not be sufficient to cause physical harm to those resources.

5 CONCLUSIONS

Construction of the Central Valley Wye alternatives would result in a direct adverse effect on one NRHP-eligible historic property, the Robertson Boulevard Tree Row. Construction has the potential to result in direct effects on unknown archaeological or built environment resources that have not yet been identified and are potentially eligible for inclusion in the NRHP. Operations of the Central Valley Wye alternatives would have no potential for adverse effects because operations would not result in visual discord, noise, or vibration that would cause substantial adverse impacts on archaeological or historic architectural resources. However, should additional built historic properties be identified, potential effects from operations will be considered along with construction-related effects.

6 REFERENCES

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ESRI	Environmental Systems Research Institute
FRA	Federal Railroad Administration

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7 PREPARER QUALIFICATIONS

The cultural resources study presented in this FOE was conducted by or under the supervision of persons who qualify as archaeologists and/or architectural historians under the professional qualification standards of the U.S. Secretary of the Interior (SOI) (as defined in 36 C.F.R. § 61). The staff listed in this section meet the standards for Qualified Investigator as defined in the Section 106 PA (Authority and FRA 2011).

Document Preparation and Technical Analysis

Susan Lassell (M.A., historic preservation, Cornell University) served as senior reviewer for the FOE. As a Senior Architectural Historian, within ICF, Ms. Lassell has 25 years of experience navigating highly complex projects through compliance with state and federal environmental laws, including NEPA, NHPA Section 106, Section 4(f), and CEQA. Ms. Lassell has a track record of producing deliverables that receive very few substantive comments during review, due in large part to her commitment to proactive communication with her clients and her ability to facilitate dialog between project proponents and the review agencies. Through a combination of experience and her master's degree in historic preservation planning from Cornell University, Ms. Lassell meets the SOI's professional qualification standards for architectural history, history, and preservation planning. As a senior reviewer for the FOE, Ms. Lassell provided technical guidance and peer review for NHPA Section 106 effects analysis and reporting.

Kathryn Haley (M.A., history–public history, California State University, Sacramento) served as the lead author and technical lead to the FOE. Ms. Haley is a historian with ICF with 14 years of experience in the field of cultural resources management. Ms. Haley works on a variety of projects and is experienced in historic research, field inventory, and site assessment, typically conducted for the purposes of NHPA Section 106, NEPA, and California Environmental Quality Act (CEQA) compliance. Ms. Haley has consulted with a wide range of clients, including state, local, and federal agencies, and serves as project manager for cultural resource technical reports. As the lead author and technical lead for the FOE, Ms. Haley provided technical information for NHPA Section 106 effects analysis and reporting.

Jena Rogers, (B.A., anthropology, California State University, Sacramento; M.A., historic preservation, Savannah College of Art and Design) served as a technical contributor to the FOE. Ms. Rogers has 25 years of cultural resources management experience in project management, technical writing, field survey, and resource evaluation, lab data management, and regulatory research and correspondence. Ms. Rogers is a cultural resources specialist and has served as an archaeologist or architectural historian on cultural resources research and regulatory compliance projects in the California and Great Basin regions for public agencies and private sector clients. Through a combination of experience and her master's degree in historic preservation, Ms. Rogers meets the SOI's professional qualification standards for archaeology and architectural history. As a technical contributor for the FOE, Ms. Rogers provided technical information and analysis for NHPA Section 106 effects analysis and reporting.

