3.14 Agricultural Lands

3.14.1 Introduction

This section describes the regulatory setting and affected environment for agricultural lands and identifies potential project impacts on these lands and associated mitigation measures. Because there are no forests between Fresno and Bakersfield, forest lands are not discussed.

The Statewide Program EIR/EIS (Authority and FRA 2005) concluded that the project would have a significant impact on agricultural lands and committed to mitigation strategies and design practices to reduce those effects. These mitigation strategies and design practices include avoiding farmland when selecting the HST alignment, situating the alignment adjacent to existing railroad rights-of-way or U.S. Geological Survey section lines that divide properties, and securing conservation easements to mitigate impacts. Additionally, to the extent possible, the HST project has been designed to avoid existing railway spurs that service agricultural businesses (e.g., by using overpasses).

Other sections of this EIR/EIS address topics related to agricultural lands and their use in agricultural production. Section 3.2, Transportation, discusses how the project will affect rural roads and provide access across the right of way for farm equipment. Section 3.4, Noise and Vibration, discusses noise and vibration impacts on confined animals. Section 3.6, Public Utilities and Energy, addresses impacts on irrigation pipelines and canals and project water demand. Section 3.8, Hydrology and Water Resources, addresses the potential for groundwater impacts. Section 3.12, Socioeconomics, Communities, and Environmental Justice addresses agricultural economics and the potential for loss of tax revenues associated with agricultural land conversion. Section 3.13, Station Planning, Land Use, and Development and Section 3.18, Regional Growth, discuss agricultural zoning and the effects of future urban development on farmlands. As discussed in Section 3.1.5 and the Executive Summary, the analysis in this chapter includes revisions based on design refinements and analytical refinements. Gray shading is used as a guide to help the reader navigate the revisions.

3.14.2 Laws, Regulations, and Orders

The following sections summarize key laws and regulations for agricultural lands relevant to the proposed project.

3.14.2.1 Federal

Farmland Protection Policy Act of 1981– [7 U.S.C. Sections 4201 to 4209 and 7 C.F.R. Part 658]

The Farmland Protection Policy Act (FPPA, 7 U.S.C. Section 4201 et seq.) is intended to protect farmland and requires federal agencies to coordinate with the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), if their activities may irreversibly convert farmland to nonagricultural use, either directly or indirectly. The stated purpose of the FPPA is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses." The FPPA requires federal agencies to examine potential direct and indirect effects to farmland of a proposed action and its alternatives before approving any activity that would convert farmland to nonagricultural use. USDA issues regulations to implement the FPPA (7 Code of Federal Regulations [C.F.R.], Chapter VI Part 658).

For the purpose of FPPA, "Important Farmland" includes prime farmland, unique farmland, and farmland of statewide or local importance, as defined by Section 1540(c)(1) of the FPPA. Classification standards differ from state to state; each state may set its own criteria for

classification in each category. Federal farmland classification criteria may differ from those developed by the California Department of Conservation (DOC), which are described in Section 3.14.2.2, State. Farmland subject to FPPA requirements includes forestland, pastureland, cropland, or other land but does not include water or urban built-up land.

The FPPA exempts the following land types:

- Soil types not suitable for crops, such as rocky terrain or sand dunes.
- Sites where the project's right-of-way is entirely within a delineated urban area and the project requires no prime or unique farmland, nor any farmland of statewide or local importance.
- Farmland that has already been converted to industrial, residential, or commercial or is used for recreational activity.

The FPPA applies to projects and programs sponsored or financed in whole or in part by the federal government. FPPA implementing regulations spell out requirements to ensure that federal programs, to the extent practical, are compatible with state, local, and private programs and policies to protect farmland. The FPPA requires a rating of farmland conversion impacts based on land evaluation and site assessment criteria identified in 7 C.F.R. Part 658.5. These criteria are addressed through completion of a Farmland Conversion Impact Rating for Corridor Type Projects (NRCS-CPA-106) form, which requires input from both the federal agency involved and from the NRCS.

3.14.2.2 State

California Land Conservation Act of 1965 (California Government Code S.51200-51295) (also known as the Williamson Act)

The California Land Conservation Act (Government Code Section 51200 et seq.) of 1965, commonly known as the Williamson Act, provides a property tax incentive for the voluntary enrollment of agricultural and open space lands in contracts between local government and landowners. The contract restricts the land to agricultural and open space uses and compatible uses defined in state law and local ordinances. Local government establishes an agricultural preserve defining the boundary within which a city or county will enter into contracts with landowners. Local governments calculate the property tax assessment based on the actual land use instead of the potential land value assuming full development.

Williamson Act contracts are for 10 years and longer. The contract is renewed automatically each year, maintaining a constant, 10-year contract, unless the landowner or local government files to initiate nonrenewal. Should that occur, the Williamson Act would terminate 9 years after the filing of a notice of nonrenewal. Only a landowner can petition for a contract cancellation. Tentative contract cancellations can be approved only after a local government approves, and the landowner pays a cancellation fee.

California has the following policies regarding public acquisition of and locating public improvements on lands in agricultural preserves and on lands under Williamson Act contracts (Government Code Sections 51290–51295):

- State policy is to avoid locating federal, state, or local public improvements and improvements of public utilities, and the acquisition of land, in agricultural preserves.
- State policy is to locate public improvements that are in agricultural preserves on land other than land under Williamson Act contract.

- State policy is that any agency or entity proposing to locate such an improvement, in considering the relative costs of parcels of land and the development of improvements, give consideration of the value to the public of land, particularly prime agricultural land, in an agricultural preserve.

Since 1998, another option in the Williamson Act Program has been established with the creation of Farmland Security Zone contracts. A Farmland Security Zone is an area created within an agricultural preserve by a county board of supervisors upon the request of a landowner or group of landowners. Farmland Security Zone contracts offer landowners greater property tax reductions and have a minimum initial term of 20 years. Like Williamson Act contracts, Farmland Security Zone contracts renew annually unless an owner files a notice of nonrenewal.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) is the only statewide agricultural land use inventory conducted on a regular basis. The California DOC administers the FMMP, under which it maintains an automated map and database system to record changes in agricultural land use. "Important Farmland" under the FMMP is listed by category, as described below. The categories are defined according to USDA land inventory and monitoring criteria, as modified for California:

- **Prime Farmland** – Prime Farmland is land with the best combination of physical and chemical features to sustain long-term agricultural crop production. These lands have the soil quality, growing season, and moisture supply necessary to produce sustained high yields. Soil must meet the physical and chemical criteria determined by the NCRS. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years prior to the FMMP's mapping date.

For the purpose of this analysis, Important Farmland includes: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance.

- **Farmland of Statewide Importance** – Farmland of Statewide Importance is similar to Prime Farmland but with minor differences, such as having greater slopes or soils with a lesser ability to store moisture. Farmland of Statewide Importance must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date.
- **Unique Farmland** – Unique Farmland has lesser quality soils than Prime Farmland or Farmland of Statewide Importance. Unique Farmland is used for producing the state's leading agricultural crops. These lands usually are irrigated, but may include non-irrigated orchards or vineyards found in some climatic zones. Unique Farmland must have been used for crops at some time during the 4 years prior to the mapping date.
- **Farmland of Local Importance** – Farmland of Local Importance is farmland that is important to the local agricultural community as determined by each county's board of supervisors and local advisory committees.

The FMMP focuses on agricultural land that has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained yields of crops. Farmland of local importance can cover a broader range of agricultural uses, and is initially identified by a local advisory committee (LAC) convened in each county by FMMP in cooperation with the NRCS and the county board of supervisors. In Fresno, Kings, and Tulare counties, confined livestock, dairy, and poultry facilities are included as farmland of local importance. Fresno County includes dryland farming and grazing land in this category, while Tulare County includes dryland farming in farmland of local importance. There is no farmland of local importance in Kern County (DOC 2004).

California Farmland Conservancy Program Act (Public Resources Code Sections 10200 to 10277)

This act provides a mechanism for the DOC to establish agricultural conservation easements on farmland. "Agricultural conservation easement" means an interest in land, less than fee simple, which represents the right to prevent the development or improvement of the land for any purpose other than agricultural production. The easement is granted for the California Farmland Conservancy Program by the owner of a fee simple interest in land to a local government, nonprofit organization, resource conservation district, or to a regional park or open-space district or regional park or open-space authority that has the conservation of farmland among its stated purposes or as expressed in the entity's locally adopted policies. It is granted in perpetuity and runs with the land. The landowner may make a request to the DOC that the easement be reviewed for possible termination 25 or more years from the date of sale of the agricultural conservation easement.

Sustainable Communities and Climate Protection Act of 2008

Adopted in September 2008, Senate Bill 375 (SB 375) provides a new planning process to coordinate community development and land use planning with Regional Transportation Plans (RTPs), in an effort to reduce sprawling land use patterns and dependence on private vehicles, and thereby reduce vehicle miles travelled (VMT) and greenhouse gas (GHG) emissions associated with VMT. SB 375 is one major tool being used to meet the goals in Assembly Bill 32 (AB 32), the Global Warming Solutions Acts. Under SB 375, the California Air Resources Board (CARB) sets GHG emission reduction targets for 2020 and 2035 for the metropolitan planning organizations (MPOs) in the state, including those in the San Joaquin Valley. Each MPO must then prepare a "sustainable communities strategy" (SCS) that meets the GHG emission reduction targets set by the CARB. Once adopted, the SCS will be incorporated into the region's RTP. The first SCS document(s) for the Central Valley were required to be completed as of 2012.

3.14.2.3 Regional and Local

The San Joaquin Valley Blueprint planning process resulted in a regional plan—the B+ Scenario—that is intended to help preserve agricultural land by focusing new development in urban centers. The San Joaquin Valley Blueprint sets out 12 smart-growth principles, including "Preserve open space, farmland, natural beauty, and critical environmental areas," but these are not mandatory for any city or county land use decision. By 2050, implementation of the regional plan is estimated to reduce the conversion of farmland in the San Joaquin Valley relative to current land use patterns by 118,000 acres (San Joaquin Valley Regional Planning Agencies 2009). On behalf of the eight councils of government that participated in the blueprint process,[1] the Council of Fresno County Governments initiated preparation of the Valley Blueprint Roadmap in early 2010 and completed the Roadmap Guidance Framework and related Planners Toolkit in August 2011. These documents will help guide local planning decisions in the direction needed to realize the values expressed by residents throughout the San Joaquin Valley. The regional plan established by the San Joaquin Valley Blueprint includes development of the HST in the BNSF corridor with stations in Fresno, Hanford, and Bakersfield (San Joaquin Valley Regional Planning Agencies 2009). The HST would provide an alternative transportation mode to valley residents, thus reducing reliance on passenger vehicles. It would also promote concentration of growth in existing urban centers.

Under SB 375, the Fresno, Kings, Tulare and Kern councils of government must include a SCS in the next edition of their regional transportation plans (expected to be adopted by 2014). The SCS

[1] The eight-county council of governments participating in the blueprint process are Stanislaus, San Joaquin, Merced, Madera, Fresno, Kings, Tulare, and Kern.

will link land use, resource conservation, housing, and transportation policies in a manner that will reduce greenhouse gas emissions in the San Joaquin Valley by 5% by 2020 and by 10% by 2035. Because SB 375 focuses on emissions from autos and light trucks, it is expected to result in transportation plan policies to reduce VMT. If an SCS fails to meet the emissions targets, the pertinent council will be required to adopt an "alternate planning strategy" (APS) that demonstrates how the emissions-reduction targets might otherwise be met. The mandate to adopt an SCS or APS will reinforce the policies of the Valley Blueprint, particularly through future transportation investments that will create incentives for compact development patterns (with lower VMT) rather than low-density sprawl (with higher VMT).

Table 3.14-1 provides a summary of the local plans and policies that were identified and considered in the preparation of this analysis.

Table 3.14-1
Local Plans and Policies

Policy Title	Summary
Fresno County	
Fresno County General Plan (Goal LU-A) (Fresno County 2003)	Contains policies for the use of agricultural lands in the county. The policies are as follows: Maintain agriculturally designated areas for agriculture use and direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for development where public facilities and infrastructure are available (Agriculture, Goal LU-A, Policy LU-A.1). Protect agricultural activities from encroachment of incompatible land uses (Agriculture, Goal LU-A, Policy LU-A.12). Protect agricultural operations from conflicts with nonagricultural uses by requiring buffers between nonagricultural uses and agricultural operations (Agriculture, Goal LU-A, Policy LU-A.13). Include an assessment of the conversion of productive agricultural lands and mitigation, where appropriate, in review of discretionary permits (Agriculture, Goal LU-A, Policy LU-A.14). Accept California Land Conservation contracts on designated agricultural lands subject to the location, acreage, and use limitations of the county (Agriculture, Goal LU-A, Policy LU-A.17).
Fresno County Zoning Ordinance	Designates agricultural land use districts (Sections 816, 817, and 819) to preserve, develop, and grow the agricultural community in the county.

Table 3.14-1
Local Plans and Policies

Policy Title	Summary
City of Fresno	
City of Fresno General Plan (City of Fresno 2002)	Contains policies that focus on the relationship between the city and farmlands outside the city limits, protecting existing uses from "untimely" conversion (Objective G-6). The policies are as follows: Allow for continued agricultural use of vacant land in the city consistent with standards for the protection of the environment; public safety and well-being; and the planned, orderly, and efficient development of the urban area (Policy G-6-a). Continue to recognize the City's agricultural preserve contracts (i.e., Williamson Act contracts) and promote the enrollment of prime farmland that remains outside of its anticipated urban growth area. Scenic or resource conservation easements should be explored as another means for protecting farmland (Policy G-6-b). Where possible, major streets will be used as boundaries between areas designated for urban development and agriculture (Policy G-6-c). When land proposed for urban development directly abuts active farmed land under an agricultural preservation contract, which has not had an application for cancellation or a Notice of Nonrenewal filed, appropriate design features need to be incorporated into the development project to buffer the agriculture/urban interface. Design features should include the following, or equivalent measures, to create an adequate buffer (Policy G-6-d): Wider building setbacks with fencing. Designated open space (including but not limited to densely landscaped strips, full-width multiuse trails or bikeways, onsite flood control, drainage or recharge facilities, and/or boundary streets.
Kings County	
Kings County 2035 General Plan (Kings County 2010)	As stated in the introduction to the Kings County 2035 General Plan, "the County's overarching priorities are to protect prime agricultural land, direct urban growth to existing cities and community districts, and increase economic and community sustainability." The plan contains goals, objectives, and policies for protecting agricultural lands. The goals are as follows: Maintain large parcel sizes, preventing the development of incompatible urban uses, maintaining agricultural land use designations, and encouraging participation in agricultural preservation programs in locations that will not conflict with planned urban growth (Land Use, Goals B1 and B2). Require mitigation for the loss of agricultural land through encouragement of Williamson Act contracts, farmland security zone contracts, and conservation easements in locations that will not conflict with planned urban growth, and through conservation of soils and control of soil erosion (Resource Conservation Goals B1, C1, and C2).

Table 3.14-1
Local Plans and Policies

Policy Title	Summary
Kings County Zoning Ordinance	Establishes County policy to protect agricultural land, operations, and facilities from conflicting uses due to the encroachment of incompatible, nonagricultural uses in agricultural areas of the county; and to advise developers, owners, and subsequent purchasers of property of the inherent potential inconveniences and discomforts often associated with agricultural activities and operations (Ordinance Number 608, Section 2, 3-5-02, Chapter 14, Article IV, Division 1, Section 14-38). Establishes zoning regulations for the AG-20 General Agricultural-20 District, AX Exclusive Agricultural District, AL-10 Limited Agricultural-10 District, and AG-40 General Agricultural-40 District.
City of Hanford	
City of Hanford General Plan (City of Hanford 2002)	Contains policies and programs to support the preservation of agricultural lands around the periphery of Hanford by imposing land use buffers, planning coordination with Kings County, agricultural land use designations, management of Williamson Act contracts, and guidance of urban development in the existing urbanized areas of the city (Objectives OCR 1 and 6).
Hanford Municipal Code	Contains zoning regulations for the Conservation and Open Space District and the Agricultural District within city limits (Title 17).
City of Corcoran	
Corcoran City Code	Designates an Agricultural District (Title 11, Chapter 6) to protect agricultural land from conversion to nonagricultural uses, and establishes City policies to support and recognize the importance of the agricultural industry in the city's economy and to promote good neighbor policies between agricultural and nonagricultural properties within city limits.
Tulare County	
Tulare County General Plan (Tulare County 2012)	Contains goals and policies for preserving agriculture as the primary land use in the county, coordinating with state and federal agricultural regulations, promoting the use of Williamson Act contracts, and implementing resource management programs (Chapter 3, Agriculture). Also contains policies regarding Williamson Act cancellation, the use of conservation easements, urban growth management, land-use buffers, right-to-farm noticing, and the improvement of regional transportation to improve agricultural goods movement.
Tulare County Code of Ordinances	Outlines the procedure for recording a Right-to-Farm Notice, designed to conserve, enhance, and encourage agricultural operations, and to minimize potential conflict between agricultural and nonagricultural land uses in the county (Part VII, Chapter 29).

Table 3.14-1
Local Plans and Policies

Policy Title	Summary
Tulare County Zoning Ordinance	Establishes zoning regulations for the AE, Exclusive Agricultural Zone; AE-10, Exclusive Agricultural Zone, 10-Acre Minimum; AE-20, Exclusive Agricultural Zone, 20-Acre Minimum; AE-40, Exclusive Agricultural Zone, 40-Acre Minimum; AE-80, Exclusive Agricultural Zone, 80-Acre Minimum; A-1, Agricultural Zone; and AF, Foothill Agricultural Zone, respectively.
Kern County	
Kern County General Plan (Kern County Planning Department 2009)	Contains policies that outline measures for the long-term retention of agriculture, timber, and other resource lands through participation in the Williamson Act Program and Farmland Security Zone Contracts, protection from incompatible land uses, and the orderly expansion of urban development (Policies 1.9-3, 1.9-5, 1.9-7, 1.9-8, 1.9-9, 1.9-12, 1.9-13, and 1.9-21 through 1.9-24).
Kern County Code of Ordinances	Outlines the right-to-farm policy of the county and establishes nuisance guidelines for agricultural uses (Title 8, Chapter 5.56.010). Provides zoning regulations for an Exclusive Agriculture District and a Limited Agriculture District (Title 19, Chapter 19.12 and 19.14).
City of Wasco	
City of Wasco General Plan (City of Wasco 2010)	Contains policies to encourage the preservation of prime farmland and farmland of statewide importance through the management of urban development, support of taxation laws that support agricultural land use, land use regulation for the conservation of soils, and the establishment of permanent agricultural preserves within the city limits (Objectives A and B of the Agricultural Element).
City of Wasco Municipal Code	Outlines the management of Williamson Act contracts in Wasco, including noticing procedures for nonrenewal and procedures for cancellation (Chapter 17.64). Establishes City policy to preserve, protect, and encourage the use of viable agricultural lands and to provide notification of the City's recognition and support of persons' and/or entities' right to farm (Chapter 17.66).
City of Shafter	
City of Shafter General Plan (City of Shafter 2005)	Contains policies for the protection and preservation of agricultural lands through land use buffers, managed urban growth, coordination with Kern County, and pursuit of Agricultural Conservation Easements within the city limits (Policies 2.4.2 through 2.4.6 and 2.4.8 through 2.4.11).
City of Shafter Code of Ordinances	Outlines procedures for application processing, notices of nonrenewal, and cancellations of agricultural preserve contracts within the city limits (Title 18, Chapter 18.04).

Table 3.14-1
Local Plans and Policies

Policy Title	Summary
City of Bakersfield	
Metropolitan Bakersfield General Plan (City of Bakersfield and Kern County 2007)	Contains policies and programs outline for planned management, conservation, and wise use of agricultural land in the Bakersfield area; promotion of soil conservation; minimization of development of prime agricultural land; and managed urban development within the city limits (Goals 1 through 3 of the Conservation Element).
Bakersfield Municipal Code	Establishes zoning regulations for the Agricultural Zone district within the city limits (Title 17, Chapter 17.32).

3.14.3 Methods for Evaluating Impacts

The methods for evaluating project impacts include using geographic information system (GIS) tools. Recently available FMMP spatial data for Fresno, Kings, Tulare, and Kern counties provided by the DOC identify Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) and Grazing Land (DOC 2008a). The DOC also provided spatial data for agricultural lands protected under Williamson Act and Farmland Security Zone (FSZ) contracts. Other GIS resources from the NRCS contained spatial data by soil type. Together, this information provided the basis for calculating land use changes. Several conservation organizations (e.g., land trusts) provided information about agricultural conservation easements. Department of Conservation data on California Farmland Conservancy Program easements and the California Conservation Easement Registry were also consulted to identify agricultural conservation easements.

To calculate the direct permanent conversion of Important Farmlands to nonagricultural use, the acreage for the project footprint for each alternative was quantified and identified as being permanently converted to HST use. In addition to estimating acreage converted to project use by the footprint, analysts examined impacts on farmland adjacent to, but not within the project footprint. These parcels were analyzed to determine the potential for being converted to nonagricultural use due to project-related impacts on adjacent farmland. The analysts looked at farmland severance on a parcel-by-parcel basis for each alternative to identify where severance of a parcel by the project footprint would create two parcels and result in remnant parcel(s) that would be too small or too physically constrained to be farmed economically; these are referred to in this report as noneconomic remnants or noneconomic remainders.[2] For each severed parcel multiple issues were analyzed to determine if the parcel should be considered a noneconomic remnant parcel and assumed converted to nonagricultural use. These issues were access (does the HST result in restricted or no access to the parcel?); size (does the HST cut a parcel creating a portion so small that it is likely not to be viable to support agricultural operations?); shape (does the HST create a parcel too oddly shaped to be viable for agriculture?); location (does the location of the parcel relative to other farmland indicate it may be readily consolidated and

[2] Many severed parcels contain small or irregularly shaped remnants. Some of these parcels were not added to the acquisition area because analysts determined that some agricultural use would likely be possible. For example, small parcels could be consolidated with adjacent landowners and larger, irregularly shaped parcels could still be farmed (although with some loss of efficiency). It is important to note that the intent of this analysis was to determine farmland that could be lost to production. Impacts associated with farm efficiency or property transactions are social and economic effects that do not mean farmland would be lost.

remain in agricultural use); and hardship (does severance cause a hardship in maintaining economic activity on an otherwise viable parcel). If any of these criteria were met, then the remnant parcel was identified as being a noneconomic remnant parcel and converted from agricultural use. These issues are further discussed in the memo on the Remnant Agricultural Parcel Analysis (2013).

To estimate direct permanent conversion of agriculture to nonagricultural use for each alternative, the quantity of the noneconomic remnant parcels was added to the project footprint to identify total Important Farmland directly and permanently converted to nonagricultural use for each alternative.

In addition to evaluating changes to Important Farmland using FMMP data, NRCS staff and project analysts conducted a farmland conversion impact rating of project alternatives using Form NRCS-CPA-106 in accordance with FPPA criteria. NRCS completed the land evaluation portion of the NRCS-CPA-106 form, considering the acreage of converted farmland (as defined by the FPPA). Project analysts prepared the site assessment using FPPA criteria (e.g., area of nonurban use, percentage of the HST corridor being farmed, protected farmland, size of farm, creation of non-farmable farmland, availability of farm support services, on-farm investments, and compatibility with existing agricultural uses). Project staff combined the scores for both the land evaluation and site assessment portions of Form NRCS-CPA-106 to arrive at a total score for each alternative. The maximum possible score is 260 points. If the score is less than 160 points, no further evaluation is necessary under the FPPA. If the score is greater than 160, the FPPA requires consideration of alternatives that avoid or minimize farmland impacts. It does not, however, mandate the adoption of such alternatives. These materials are included in Appendix 3.14-A. [3]

In addition to the GIS analysis and NRCS-CPA-106 calculations, public and agency input (e.g., during the Project EIR/EIS scoping process) also informed the analysis. Scoping comments helped define a range of possible impacts to consider in the EIR/EIS for agricultural lands adjacent to the HST, including disruption of adjacent agricultural operations (e.g., orchards, dairies) from dust, noise, and wind. These comments helped the Lead Agencies to consider a broader range of potential impacts than expected prior to the scoping process.

Project effects on Williamson Act and FSZ lands were evaluated through a parcel-by-parcel analysis of the alternative project alignments and corresponding parcel boundaries. Divided and remnant parcels were evaluated on the basis of whether they met the minimum acreage requirements for Williamson Act and FSZ contracts established by each county. If a parcel did not meet the minimum acreage requirement, the affected area was added to the potential acreage affected by the project.

The Authority created an agricultural technical working group to study specific issues related to agriculture and the effects of the HST on it. The working group evaluated project impacts to confined animal facilities, agricultural equipment, induced wind (pollination, bee, dust, and drift), agricultural infrastructure, and irrigation systems.

3.14.3.1 Methods for Evaluating Effects under NEPA

Pursuant to NEPA regulations (40 C.F.R. 1500-1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration

[3] Additional consultation with NRCS in 2014 confirmed this analysis represents a good estimate of the impacts on prime and statewide important farmland (NRCS 2014).

of the effect (short- or long-term), and other considerations. Beneficial effects are identified and described. When there is no measurable effect, an impact is found not to occur. The intensity of effects is the degree or magnitude of a potential effect, described as negligible, moderate, or substantial. Context and intensity are considered together when determining whether an impact is significant under NEPA. Thus, it is possible that a significant adverse effect may still exist when the intensity of the impact is determined to be negligible or even if the impact is beneficial.

For agricultural lands, the terms *negligible*, *moderate*, and *substantial* are defined as follows:

> An impact with *negligible* intensity would be a farmland conversion that would not be measurable by FMMP, which uses a minimum land use mapping unit of 10 acres. Temporary impacts (e.g., where farmland is restored following construction) also would be of negligible intensity.
>
> An impact with *moderate* intensity would be a conversion of agricultural land that is measurable by FMMP (e.g., greater than 10 acres) but not an impact with substantial intensity (i.e., less than 50 acres).
>
> An impact with *substantial* intensity within the context of the highly productive Central Valley farmland in the project area would be a conversion of agricultural land resources of more than 50 acres.

Agricultural lands are not replaceable, and therefore any Important Farmland conversion is a permanent depletion of the resource. Indirect effects (e.g., from noise or induced winds) are evaluated in terms of their contribution to farmland conversion. In other words, indirect effects may increase the amount of farmland conversion from the project footprint, resulting in additional farmland losses. Indirect impacts that result in economic or social effects but no additional farmland conversion are not farmland impacts; this section addresses farmland impacts, but social and economic impacts are evaluated in Section 3.12, Socioeconomics, Communities, and Environmental Justice.

3.14.3.2 CEQA Significance Criteria

The project would result in a significant impact on agricultural lands if it would:

- Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance (collectively, "Important Farmland"), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to a nonagricultural use.
- Conflict with existing zoning for agricultural use or a Williamson Act contract in a manner that would result in conversion of Important Farmland to nonagricultural use.
- Involve other changes in the existing environment that would result in conversion of Important Farmland to nonagricultural use because of their location or nature.

3.14.3.3 Study Area for Analysis

The study area for effects on agricultural lands encompasses the entire potential area of disturbance associated with the project construction footprint (for direct effects), plus 100 feet from the track centerline based on federal standards for evaluating livestock noise impacts (High-Speed Ground Transportation Noise and Vibration Impact Assessment [FRA 2005]) (see Chapter 3.4 Noise and Vibration, subsection 3.4.5.3). As described in Section 3.1, Introduction, the construction footprint includes the proposed HST right-of-way and associated facilities (including traction power substations, switching and paralleling stations, and areas associated with modifying or relocating roadways for those facilities, such as overcrossings and interchanges),

heavy maintenance facility sites, and other construction areas, including laydown, storage, and similar areas. Parcels that the HST alignments could sever were part of the study area for direct and indirect effects. The analysis looked more broadly at a regional perspective for purposes of evaluating the potential for agricultural land conversion mitigation measures to create secondary impacts on the environment.

The urbanized downtown Fresno and Bakersfield station areas are located within the study area; however, they are not addressed further because these urban areas do not include agricultural lands. As the Kings/Tulare Regional Station areas located to the east and west of Hanford are in rural settings, their potential effects on agricultural lands are addressed here.

3.14.4 Affected Environment

This section describes the existing agricultural lands. It provides information about regional agricultural operations and those in the project vicinity. This section also discusses confined animal facilities, which are primarily dairies in the study area.

3.14.4.1 Regional Agriculture

In 2007, California had approximately 25.4 million acres of farmland, with an estimated 81,000 farms (USDA 2009). According to the California Department of Food and Agriculture (CDFA 2009), the state produces more than 400 different types of agricultural products and, in 2007, generated $36.6 billion in direct farm sales. California's agricultural production represents 12.8% of the nation's total agricultural value (in dollars). California is also a major global supplier of food and agricultural commodities, with exports reaching a high of $10.9 billion in 2007, representing an 11% increase over the 2006 export totals.

The south San Joaquin Valley, where the Fresno to Bakersfield Section is located, is California's and the nation's leading agricultural production region (CDFA 2010). The cash farm receipts from Fresno, Kings, Tulare, and Kern counties of about $16.5 billion in 2008 represented 46% of the state's total agricultural revenues. Fresno, Kern, Tulare, and Kings counties rank first, second, third, and eighth, respectively, among California's top agricultural counties, as measured by the gross value of agricultural production (CDFA 2010). The total county land area committed to agricultural production ranges from 38% in Tulare County to 77% in Kings County.

In addition to farmlands, California currently has 1,600 to 1,800 dairies; 80% of the dairies are in the Central Valley. Dairy properties include areas for forage crop production (e.g., corn). California does not produce sufficient forage to support the dairy industry, and dairy farmers import forage, primarily from Nevada and Idaho (CH2M Hill 2010). The forage crop areas associated with dairies receive dairy waste in accordance with a nutrient management plan, and the requirements include manure containment, application of manure at an appropriate agronomic rate, and nutrient balance. To comply with the plan, dairies might need to reduce herd size, increase acreage, or haul manure offsite. Dairies require large-scale operations to allow for the increasing cost of environmental compliance (Castillo 2010).

According to the most recent Census of Agriculture profile for Fresno County, there were 6,081 farms occupying more than 1.6 million acres of land in 2007, with an average farm size of 269 acres (USDA 2009). More than 67% of farmland was devoted to crops, and about 29% was in pasture (other uses accounted for about 4% of total farmland). About 60% of the crop land is irrigated. The market value of agricultural products in 2007 was more than $3 billion: 67% from crop sales and 33% from livestock and poultry and livestock products. The highest crop acreages were devoted to grapes, vegetable crops, cotton, almonds, and tomatoes. In order of sales value, the most important agricultural commodities were fruits, tree nuts, and berries; vegetables,

melons, and potatoes; milk and other dairy products; cattle; poultry and eggs; and cotton and cottonseed.

In 2007, Kings County had 1,129 farms occupying 680,000 acres of land, with an average farm size of 603 acres (USDA 2009). About 75% of the farmland was devoted to crops, and 61% of this land was irrigated. The market value of agricultural products in 2007 was more than $1.3 billion: 48% from crop sales and 52% from livestock, poultry, and livestock products. In order of sales value, the most important agricultural commodities were milk, cotton, cattle and calves, tomatoes, nuts, grapes, and silage (Kings County Department of Agriculture 2009).

In Tulare County, 5,240 farms occupied more than 1.1 million acres of land in 2007, with an average farm size of 223 acres. About 55% of the farmland was devoted to crops, and 47% of this land was irrigated (USDA 2009). The market value of agricultural products was more than $3.3 billion: 36% from crop sales and 64% from livestock and poultry and livestock products. In order of sales value, the most important agricultural commodities were fruit and nut crops (primarily grapes and almonds), milk, livestock and poultry, and alfalfa and silage (Tulare County Agriculture Commissioner/Sealer 2009).

In Kern County, 2,117 farms occupied more than 2.3 million acres of land in 2007, with an average farm size of 1,116 acres. About 40% of the farmland was devoted to crops, and 33% of this land was irrigated (USDA 2009). The market value of agricultural products in 2007 was more than $3.2 billion: 80% from crop sales and 20% from livestock and poultry and livestock products. In order of sales value, the most important agricultural commodities were milk, grapes, citrus, almonds, carrots, alfalfa, and cattle and calves (Kern County 2009).

When originally established, farms in the project vicinity were rectangular parcels that followed township and range survey patterns, which were composed of many similarly shaped parcels. Over time, construction of the railroads, state highways, and local roads divided some farms, creating irregularly shaped parcels.

The majority of farms in the four-county region are family-owned and typically range from 10 to 179 acres. However, Kings and Kern counties have the largest number of farms over 1,000 acres in size in the San Joaquin Valley (USDA 2009). Many owners of these large farms hire agricultural management companies to run agricultural operations and specialized service firms to oversee pesticide application, bee pollination, or harvesting. Farm infrastructure typically includes irrigation and drainage systems, field access roads that often surround the farmed parcels, storage structures such as silos and barns, power distribution systems, and residences.

Although weather conditions, such as temperature and wind, affect crop production, timing and scheduling of agricultural management and operations help maximize yields. For example, farmers apply chemicals to extend blooms of bee-pollinated trees to increase the pollination potential. Depending on the crop and the application, ground-level spray rigs and crop dusters are used to apply pesticides and other chemicals. In accordance with Federal Aviation Regulations 137, Agricultural Aircraft Operations, and the California Code of Regulations, Division 6, Pesticides and Pest Control Operations, aircraft apply some pesticides when the wind speed and direction are favorable to avoid dispersing chemicals beyond the target area. Aerial applications occur near existing railroad tracks (Alfson 2011, personal communication; Brandt 2011, personal communication; Arroyo 2011, personal communication). Approximately 85% of aerial application occurs at night in the south San Joaquin Valley; a 200-acre field takes about 15 minutes to spray by air (Hansen 2011, personal communication).

3.14.4.2 Important and Protected[4] Farmlands

According to the FMMP data, there are more than 3.7 million acres of Important Farmland in Fresno, Kings, Tulare, and Kern counties combined (see Table 3.14-2). In addition, there are more than 3.3 million acres of Grazing Land in the four counties. The FMMP defines Grazing Land as land that has existing vegetation that is suitable for the grazing of livestock (DOC 2008a). In all four counties, the practice is to fence grazing areas to prevent livestock from crossing major transportation corridors, such as the BNSF Railway and State Route (SR) 41. Table 3.14-2 presents the total acreage of each category of Important Farmland and Grazing Land in Fresno, Kings, Tulare, and Kern counties. Figures 3.14-1 through 3.14-5 show the distribution of Important Farmland and Grazing Land in the vicinity of the project alternatives. Figures 3.14-6 through 3.14-10 show the distribution of crop cover in these areas.

Table 3.14-2
Important Farmland and Grazing Land in Fresno, Kings, Tulare, and Kern Counties (acres)[a]

Type of Agricultural Land	Fresno County	Kings County	Tulare County	Kern County
Prime Farmland	693,200	138,100	375,100	626,200
Farmland of Statewide Importance	439,000	397,100	327,200	216,300
Unique Farmland	94,200	22,900	11,900	96,700
Farmland of Local Importance	149,900	10,000	150,200	0
Grazing Land	827,000	257,700	439,900	1,807,100
Total	**2,203,200**	**825,800**	**1,304,300**	**2,746,300**

Source: California Department of Conservation, 2008b.
[a] Rounded to nearest 100 acres.

Although each county in the project study area has policies to protect agricultural lands, according to the DOC farmland conversion data, conversions of Important Farmland continue to occur. Table 3.14-3 presents the change in acreages of Important Farmland and Grazing Land between 2000 and 2008. All four counties reported a reduction in Important Farmland acreage during this period, with most reductions occurring in Fresno County. Population growth and the associated pressure for rural "ranchettes" and urban development primarily drive the loss of Important Farmland; however, losses also can occur if land goes into habitat conservation or confined animal facilities. Gains in Important Farmland also can occur, for example, when grazing land goes into crop production (e.g., increased area planted to almonds). Nevertheless, one of the leading regions in the state that is losing Important Farmland to urban or other non-farming uses is the San Joaquin Valley (DOC 2008a).

[4] Protected farmland consists of farmland under Williamson Act or Farmland Security Zone contract and farmland under an agricultural conservation easement.

Table 3.14-3
Farmland Conversions in Fresno, Kings, and Tulare Counties from 2000 to 2008 and Kern County from 2004 to 2008

County and Farmland Category	Net Change in Acreage
Fresno County	
Prime Farmland	-40,876
Farmland of Statewide Importance	-52,550
Unique Farmland	-8,589
Farmland of Local Importance	77,755
Total Change in Important Farmland	-24,260
Grazing Land	-8,918
Total Change in Agricultural Land	**-33,178**
Kings County	
Prime Farmland	-3,125
Farmland of Statewide Importance	-33,696
Unique Farmland	-5,523
Farmland of Local Importance	3,173
Total Change in Important Farmland	-39,171
Grazing Land	19,261
Total Change in Agricultural Land	**-19,910**
Tulare County	
Prime Farmland	-17,910
Farmland of Statewide Importance	-23,385
Unique Farmland	197
Farmland of Local Importance	24,931
Total Change in Important Farmland	-16,167
Grazing Land	5,804
Total Change in Agricultural Land	**-10,363**
Kern County	
Prime Farmland	-16,911
Farmland of Statewide Importance	1,643
Unique Farmland	-12,662
Farmland of Local Importance	0
Total Change in Important Farmland	-27,930
Grazing Land	15,602
Total Change in Agricultural Land	**-12,328**
Source: California Department of Conservation. 2008b.	

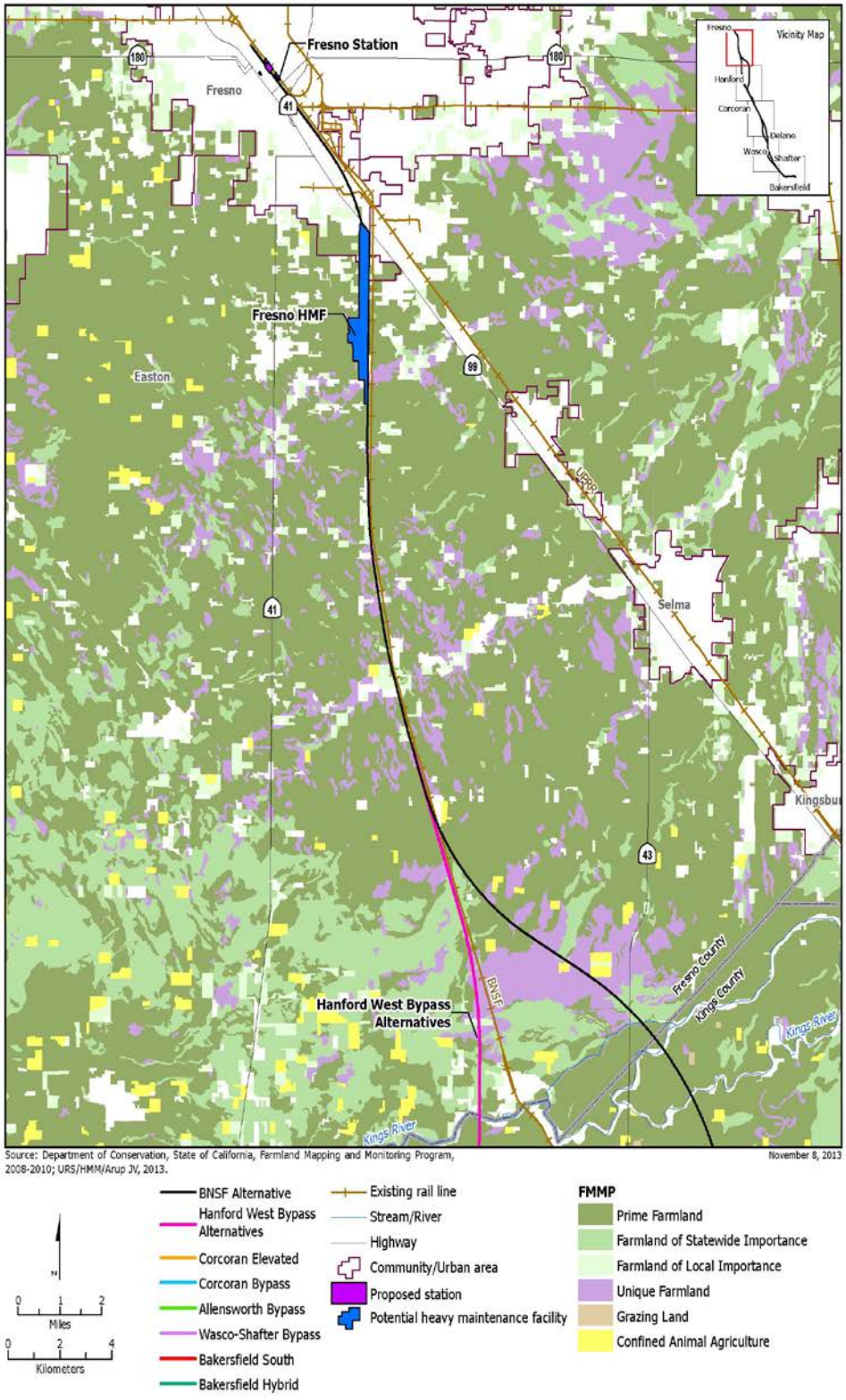

Figure 3.14-1
Important Farmland and Grazing Land in the Fresno project vicinity

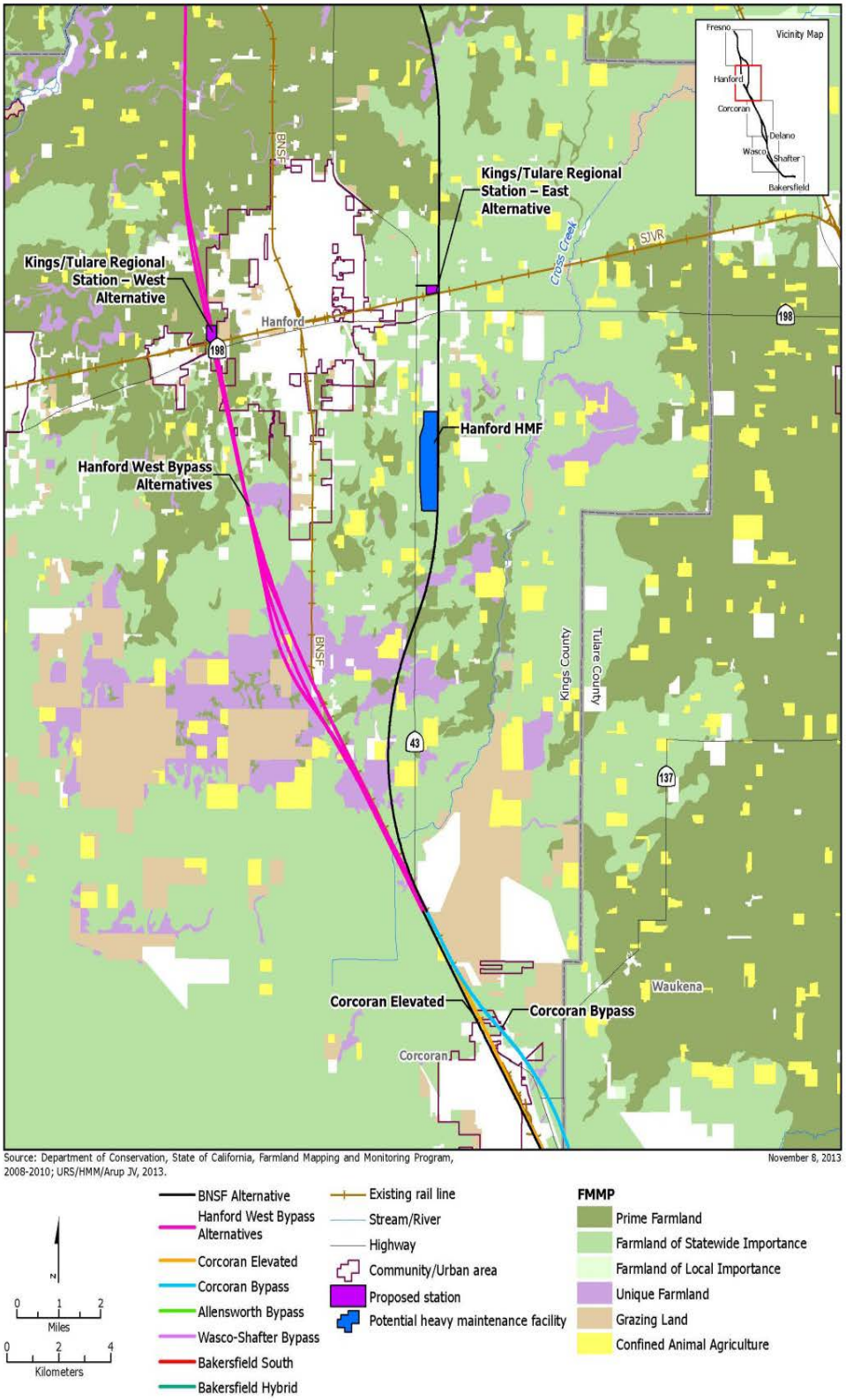

Figure 3.14-2
Important Farmland and Grazing Land in the Hanford project vicinity

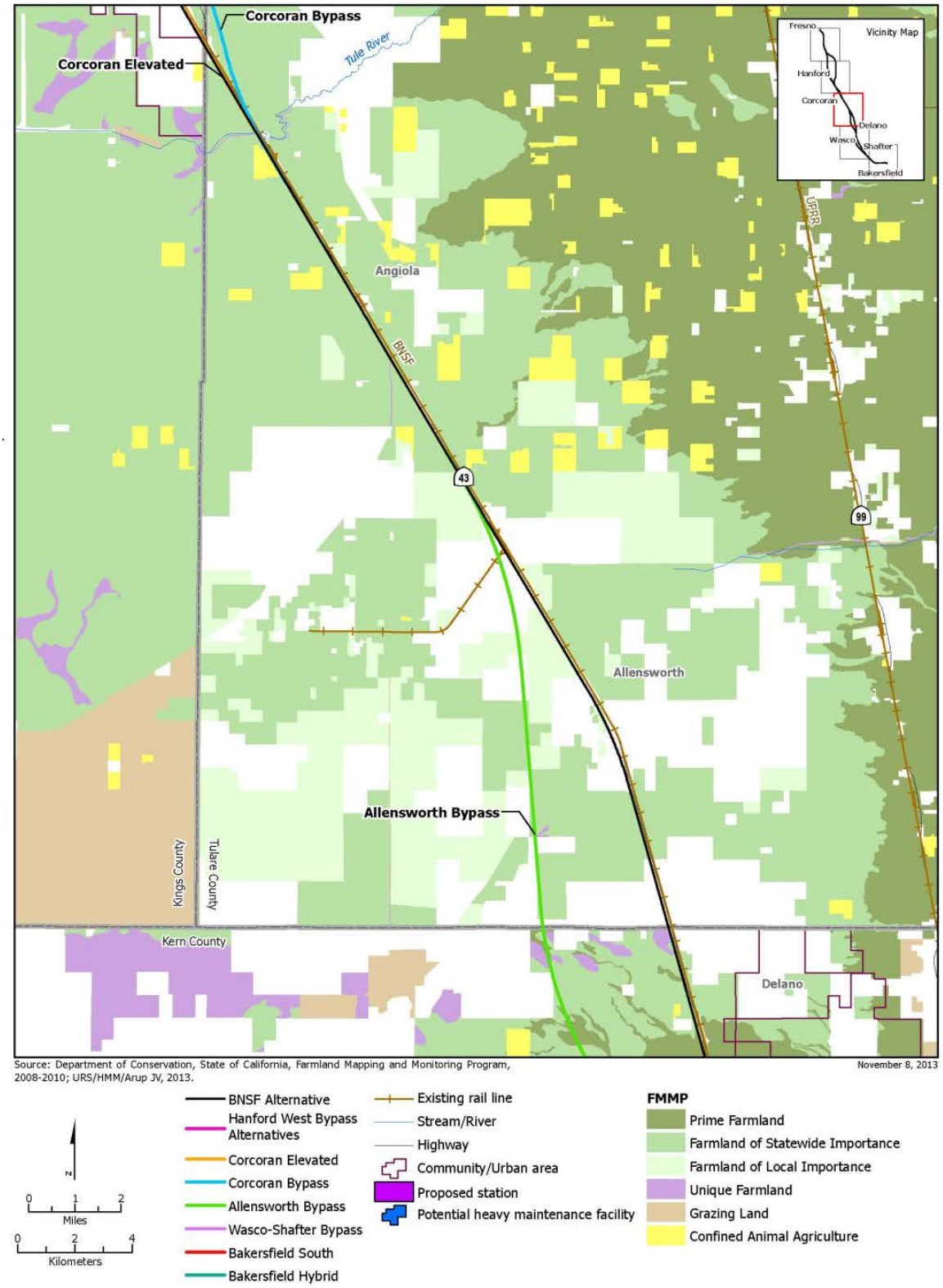

Figure 3.14-3
Important Farmland and Grazing Land in the Corcoran project vicinity

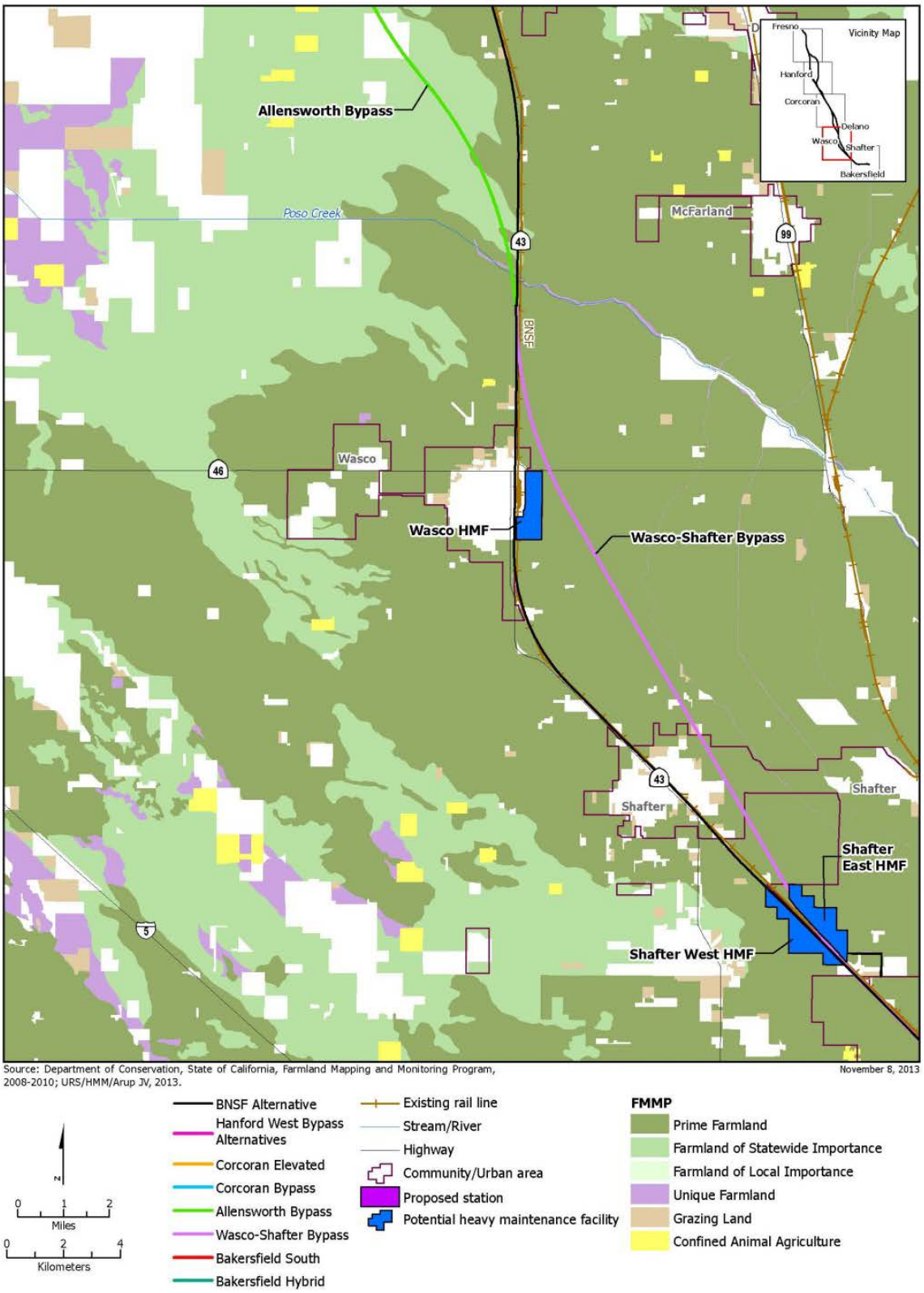

Figure 3.14-4
Important Farmland and Grazing Land in the Wasco–Shafter project vicinity

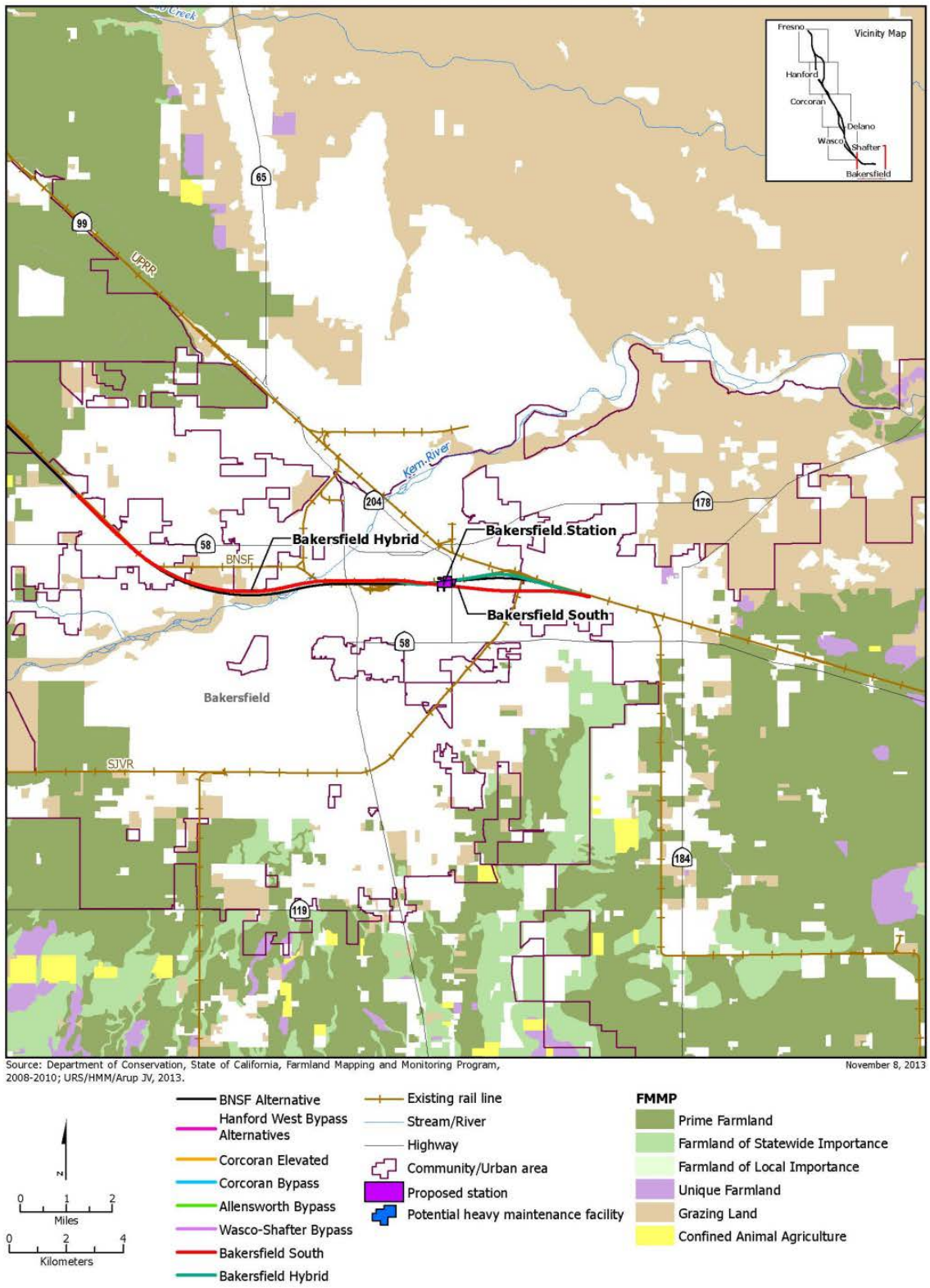

Figure 3.14-5
Important Farmland and Grazing Land in the Bakersfield project vicinity

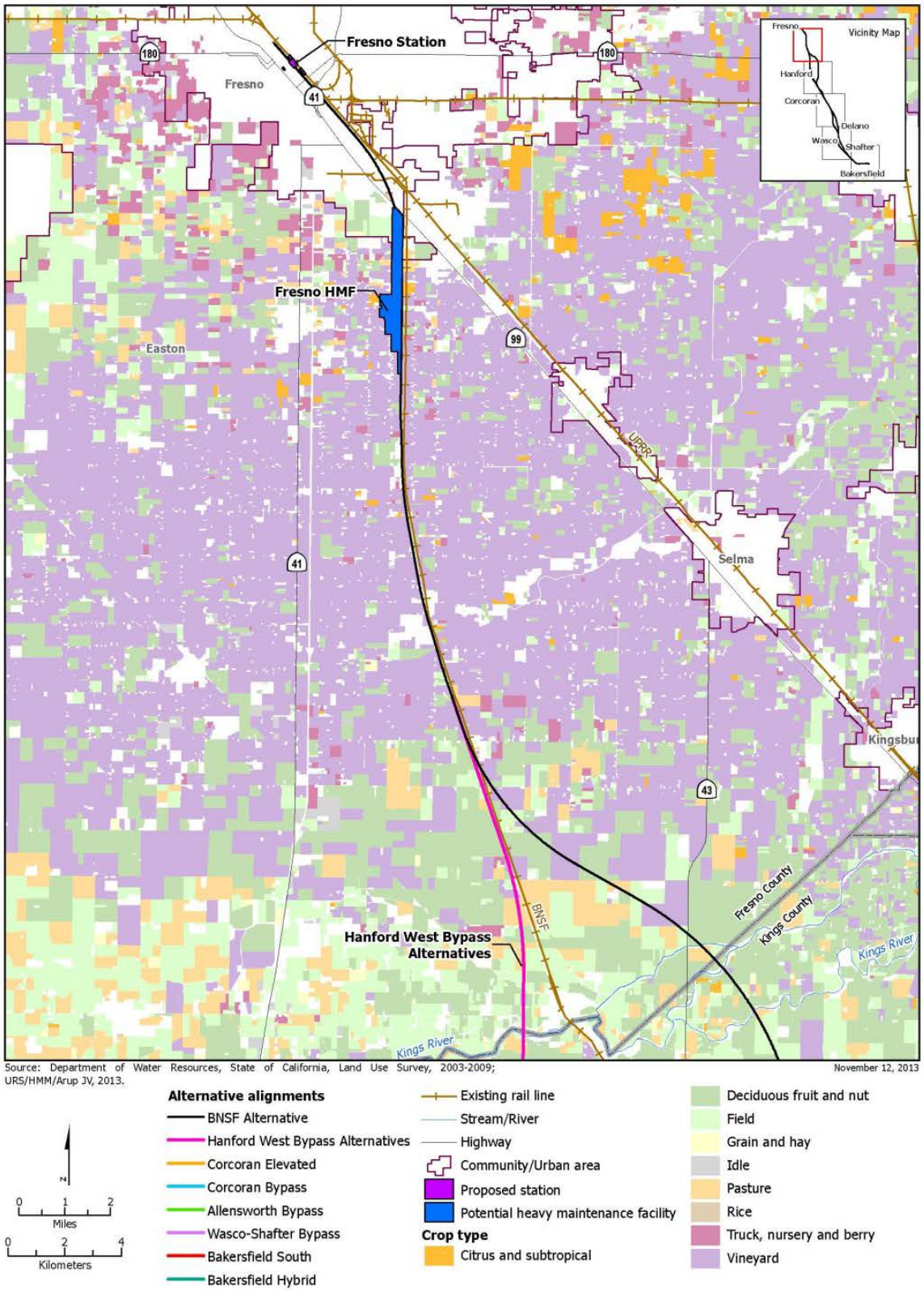

Figure 3.14-6
Distribution of crop cover in the Fresno project vicinity

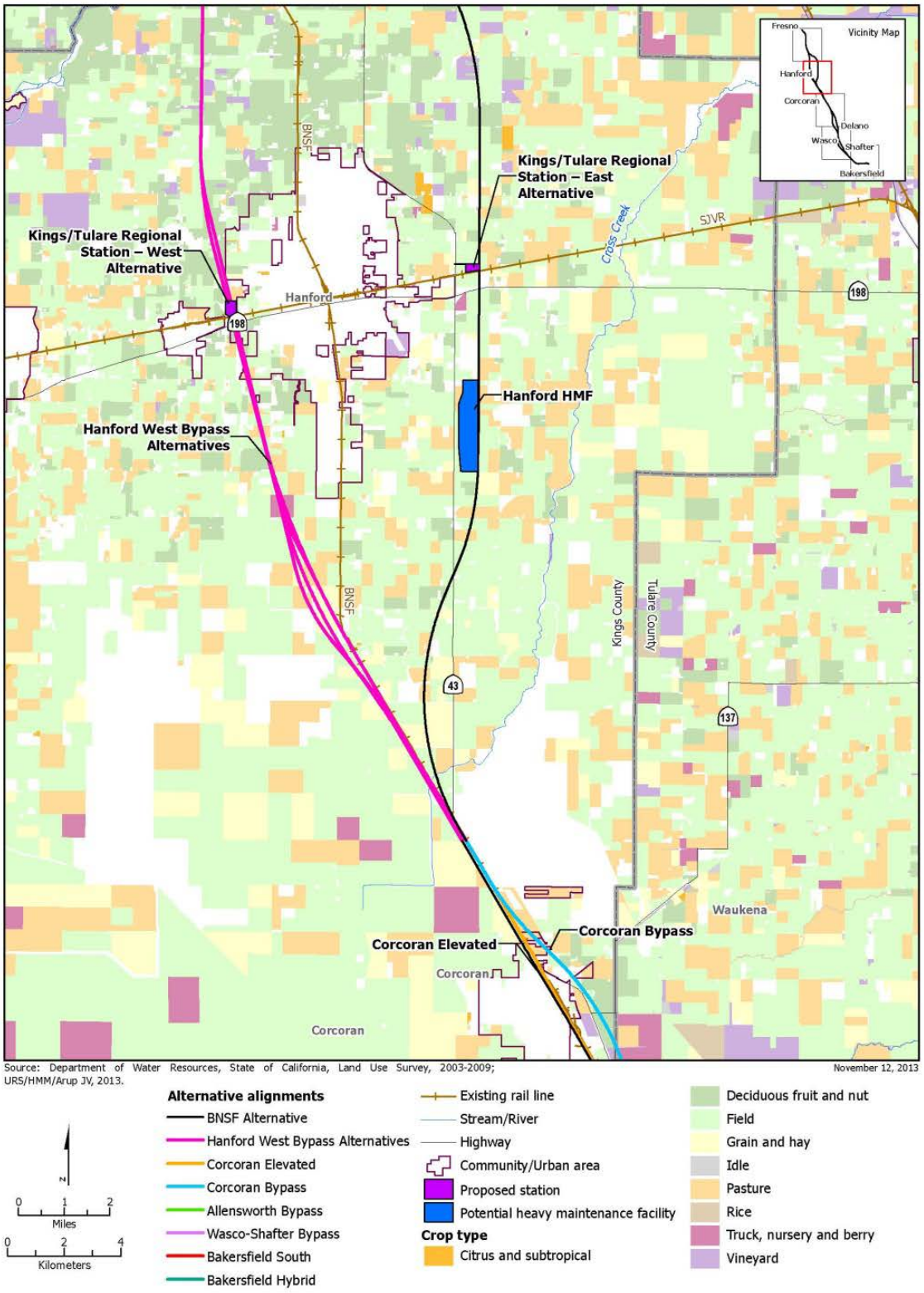

Figure 3.14-7
Distribution of crop cover in the Hanford project vicinity

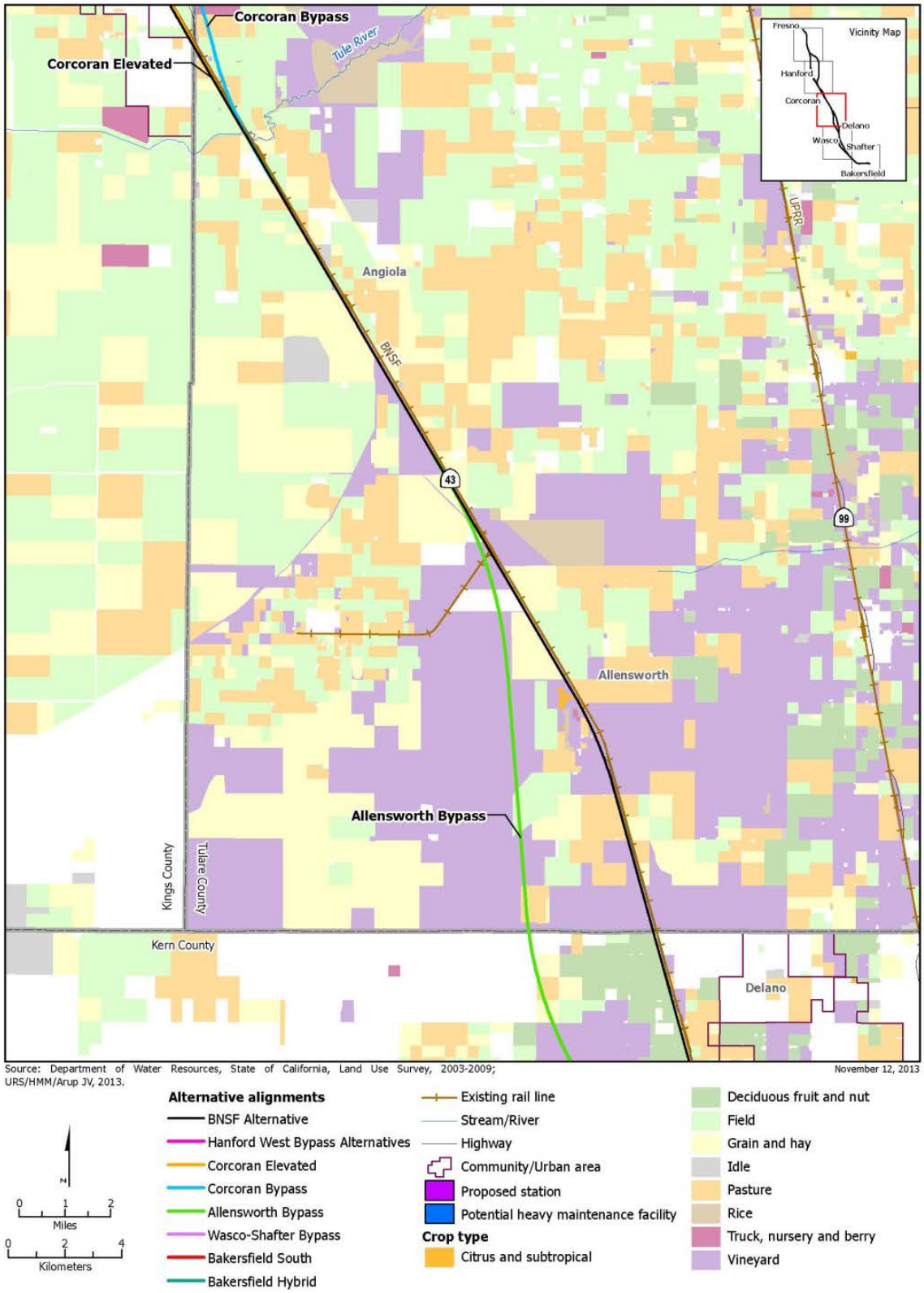

Figure 3.14-8
Distribution of crop cover in the Corcoran project vicinity

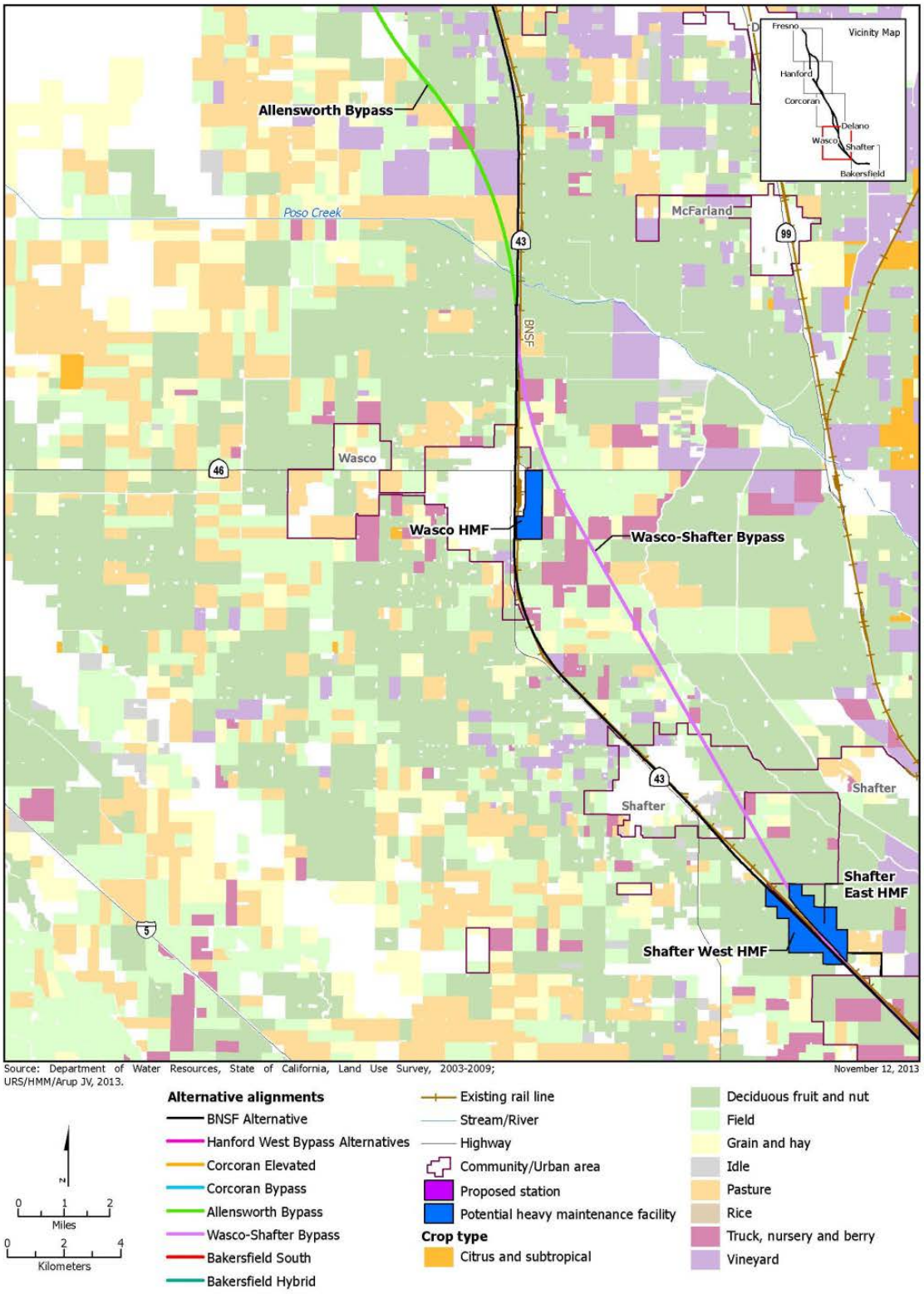

Figure 3.14-9
Distribution of crop cover in the Wasco–Shafter project vicinity

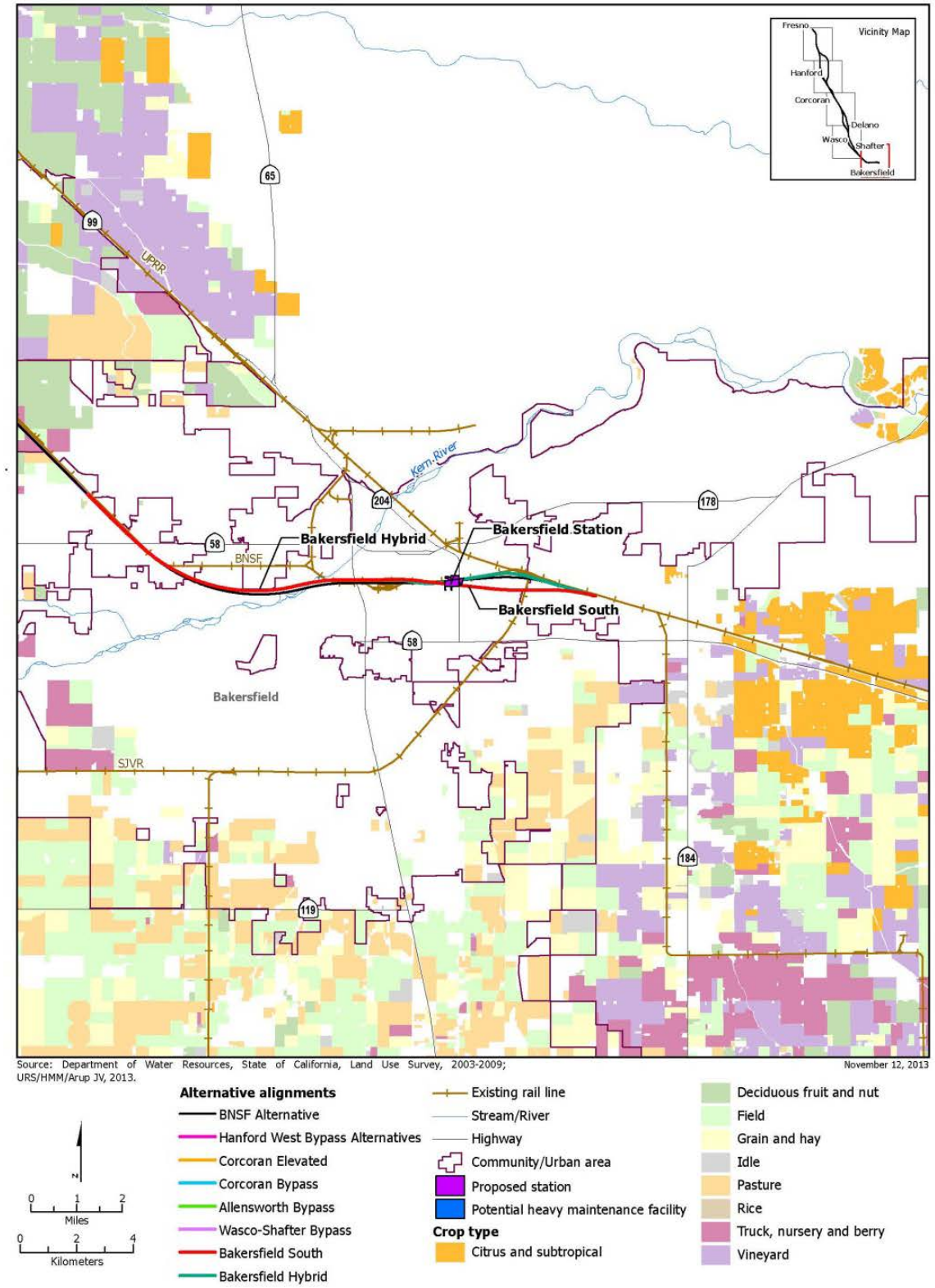

Figure 3.14-10
Distribution of crop cover in the Bakersfield project vicinity

Table 3.14-4 presents the acreage of farmland protected under Williamson Act and FSZ contracts in each county.

Table 3.14-4
Protected Farmland in Fresno, Kings, Tulare, and Kern Counties (acres) (2008)

Protected Farmland	Fresno County	Kings County	Tulare County	Kern County
Williamson Act Contract	1,465,383	391,626	1,086,692	1,541,814
Farmland Security Zone Contract	29,114	287,833	11,152	158,927
Total	**1,494,497**	**679,459**	**1,097,844**	**1,700,741**

Source: California Department of Conservation 2010.

Tulare and Kings counties have the greatest percentage, 84% and 82%, respectively, of their Important Farmland and Grazing Land in Williamson Act and FSZ contracts, while Kern and Fresno counties have the smallest percentages, at approximately 62% and 68%, of their lands in these contracts. Protected farmlands also include lands zoned for agricultural use and lands with agricultural conservation easements. Most of the Important Farmland in the area is zoned for agriculture (see Section 3.13, Station Planning, Land Use, and Development). Information from both land trusts and the California Department of Conservation shows that the project crosses counties with agricultural land under conservation easements; however, none of that land is within a mile of any of the project alternatives. Tulare County has an additional 686 acres of agricultural land over a mile away from any of the project alternatives that is also protected by other enforceable restrictions (DOC 2010b).

Figures 3.14-11 through 3.14-15 show that protected farmlands occur along all of the alignment alternatives outside urban communities. FSZ lands are adjacent to the alignment alternatives in Kings, Tulare, and Kern counties. There is no land in FSZ contract along the alternative alignments in Fresno County.

The Kings/Tulare Regional Station–East Alternative site is on land under FSZ nonrenewal contract (Figure 3.14-12). Both the potential at-grade and below-grade options of the Kings/Tulare Regional Station–West Alternative are located on lands under Williamson Act nonrenewal contract. The potential Fresno and Wasco Heavy Maintenance Facility (HMF) sites are not located on land in Williamson Act contracts. Most of the land at the Hanford HMF site is either under Williamson Act or FSZ contracts. At the two Shafter HMF sites most of the land is under nonrenewable Williamson Act contracts.

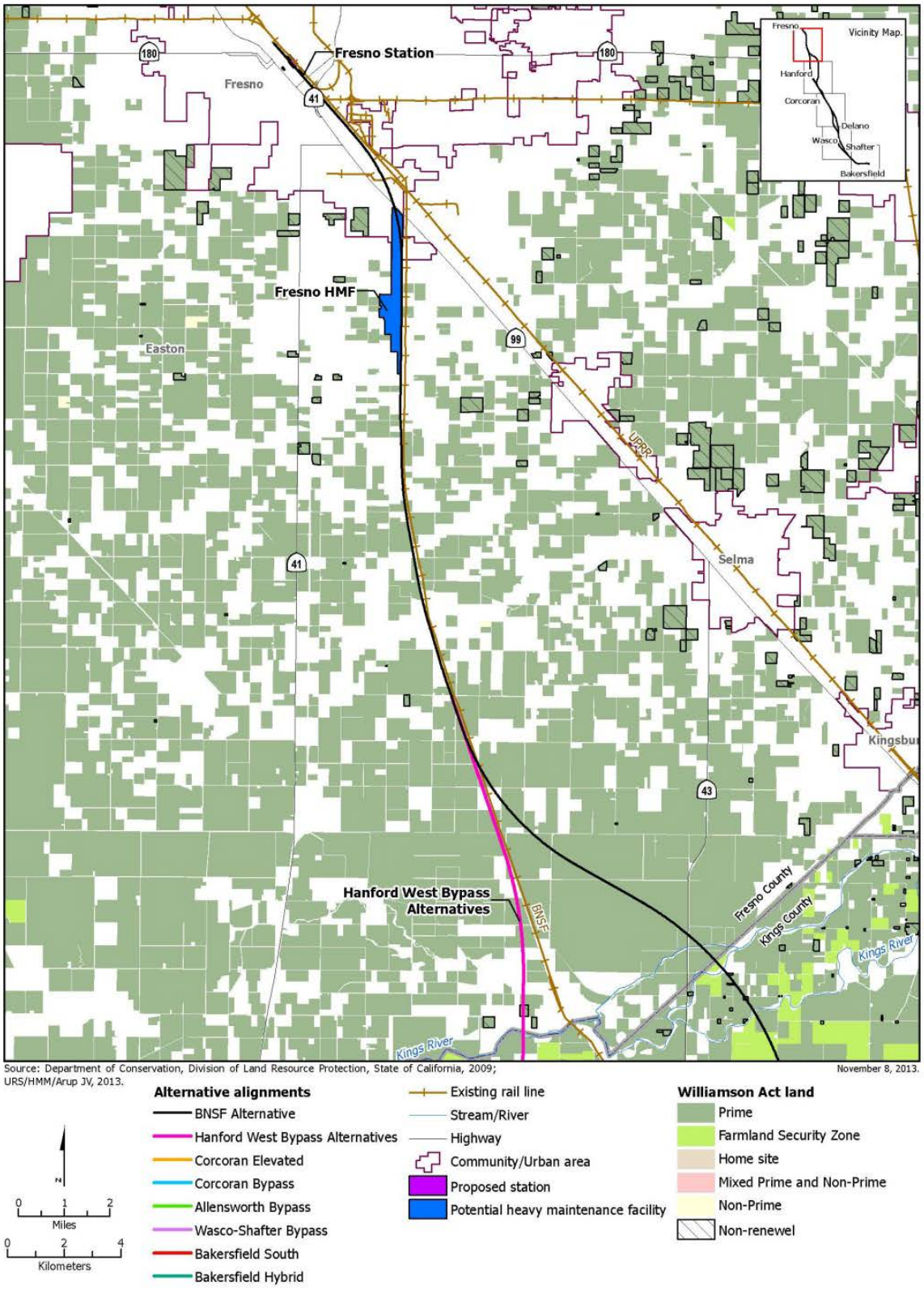

Figure 3.14-11
Protected lands in Fresno project vicinity

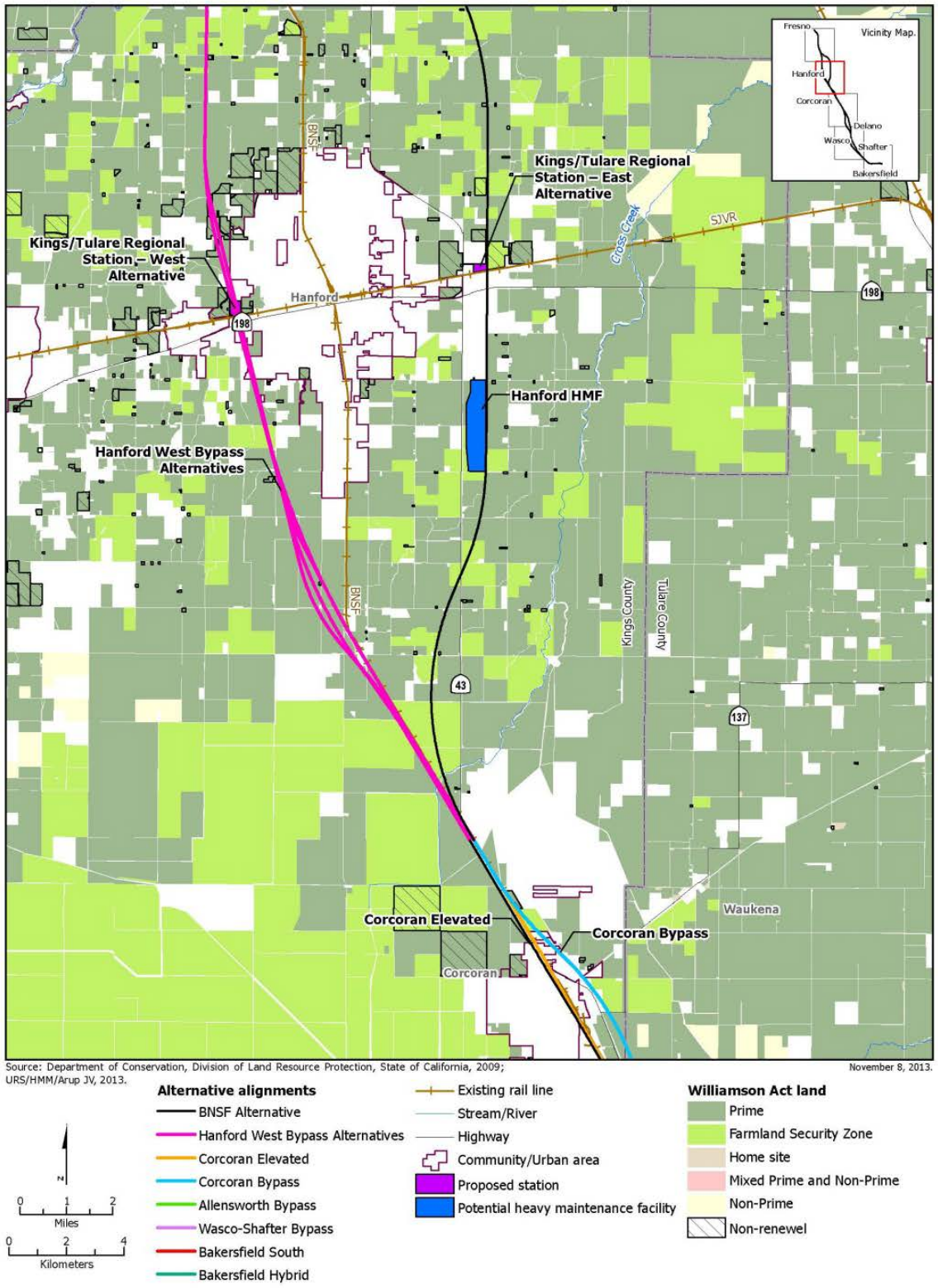

Figure 3.14-12
Protected lands in Hanford project vicinity

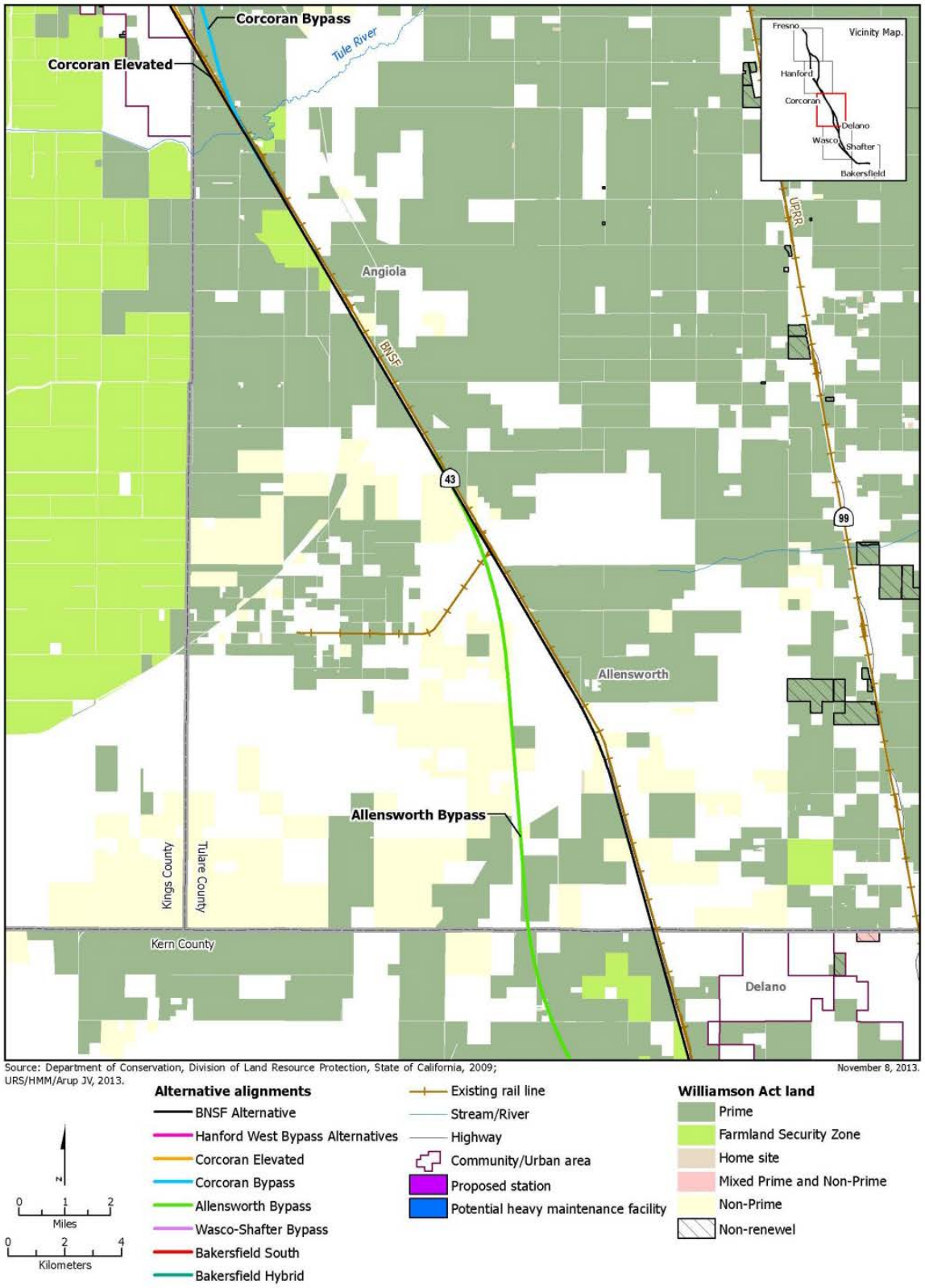

Figure 3.14-13
Protected lands in Corcoran project vicinity

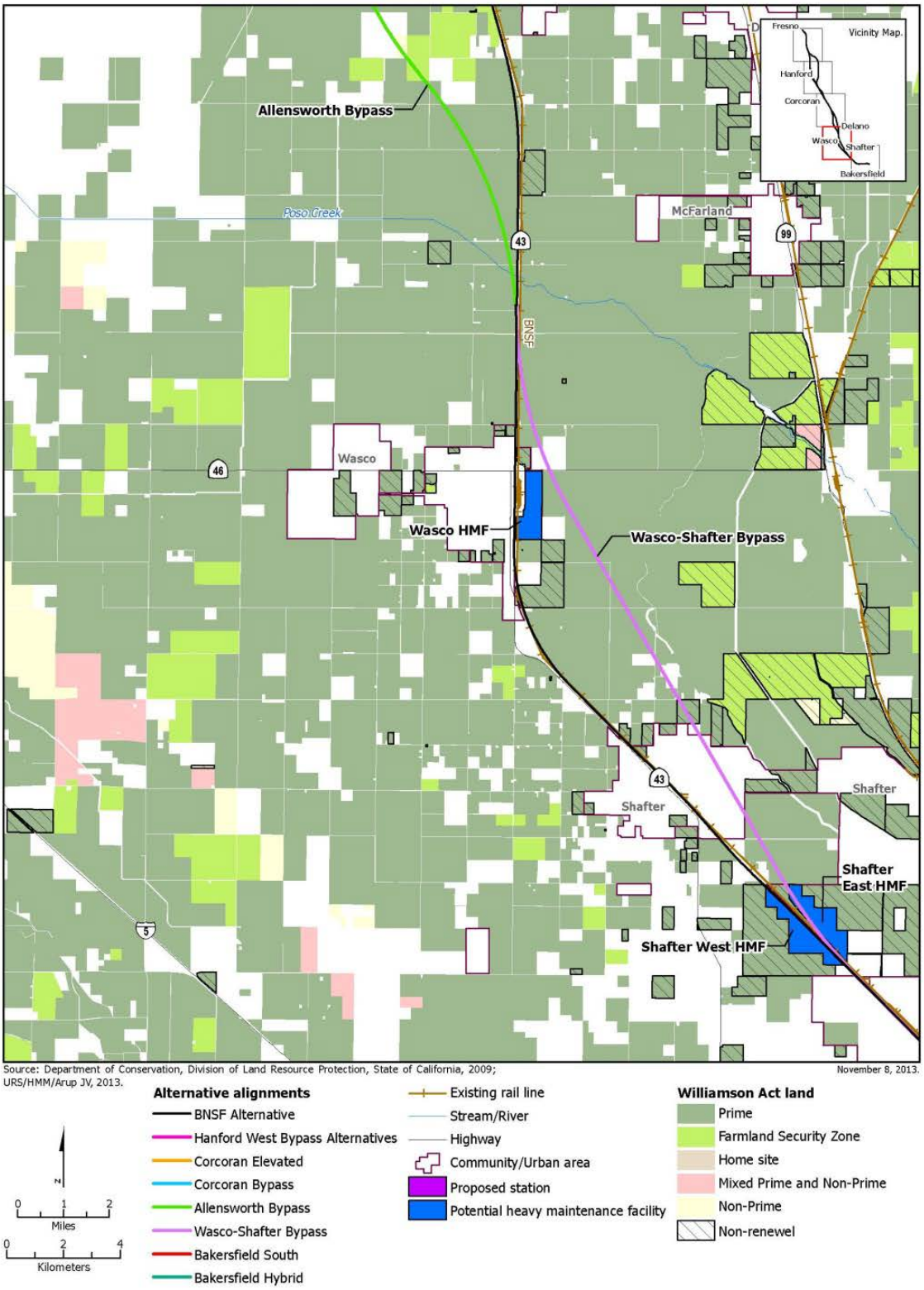

Figure 3.14-14
Protected lands in Wasco–Shafter project vicinity

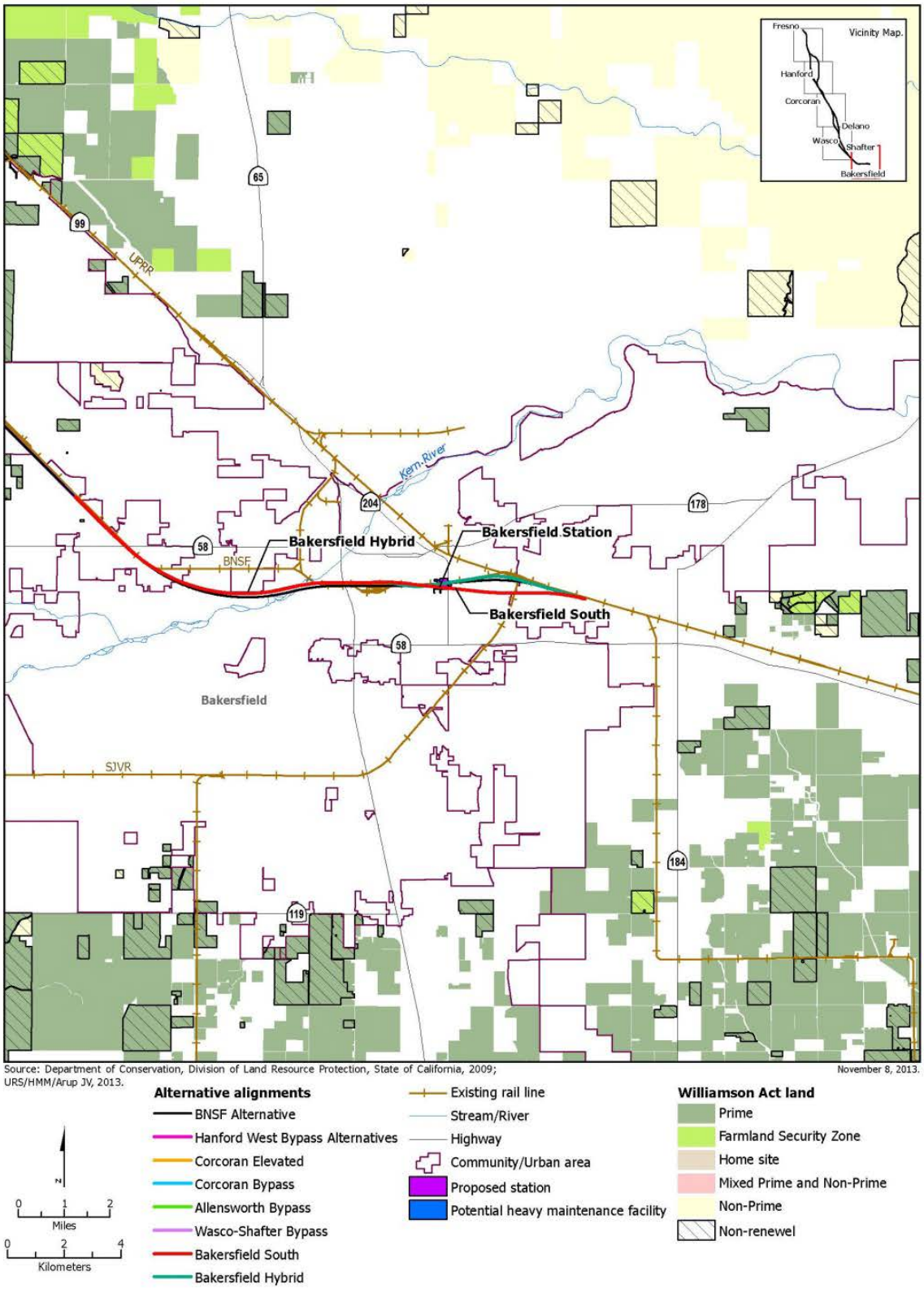

Figure 3.14-15
Protected lands in Bakersfield project vicinity

3.14.4.3 Agricultural Lands Along the Proposed HST Alternatives

The following subsections describe the agricultural lands that are associated with the HST alternatives.

BNSF Alternative

Important Farmlands and farmland protected by Williamson Act and FSZ contracts occur along most of the BNSF Alternative. The majority of the farmland in the vicinity of the BNSF Alternative is classified as Prime Farmland and Farmland of Statewide Importance. The alternative crosses a small area classified as Grazing Land to the north of Corcoran in Kings County. Large areas in the vicinity of the BNSF Alternative in Tulare County are designated as nonagricultural or natural vegetation (Figure 3.14-13). The largest concentration of FSZ contract lands occurs in the vicinity of the alternative in Kings County. Approximately 15% of the farmland adjacent to the alternative in this county is FSZ contract land. The alignment alternative is adjacent to FSZ lands at the Tule River and near Angiola in Tulare County (Figure 3.14-13) and near Allensworth in Kern County. The BNSF Alternative crosses land under Williamson Act contracts in all four counties. Confined animal facilities are located along the alignment in Fresno, Kings, and Tulare counties with the highest concentration in Kings County. No agricultural conservation easements have been identified within the footprint of this alternative.

Hanford West Bypass Alternatives

The Hanford West Bypass alternatives pass through lands under both Williamson Act and FSZ contracts. Land types affected include Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, Unique Farmland, and Grazing Land. Confined animal facilities are located along all four alternative alignments in Kings County. No agricultural conservation easements have been identified within the footprint of these alternatives.

Corcoran Elevated Alternative

The Corcoran Elevated Alternative crosses through the urban area of the city of Corcoran. No lands along this alignment are under Williamson Act or FSZ contracts. No confined animal facilities are located along this alternative alignment. No agricultural conservation easements have been identified within the footprint of the alternative.

Corcoran Bypass Alternative

The Corcoran Bypass Alternative crosses Grazing Land and Farmland of Statewide Importance. The lands immediately east of Corcoran in Kings County are under Williamson Act and FSZ contracts (Figure 3.14-12). All of the land in the vicinity of the Corcoran Bypass Alternative in Tulare County is under Williamson Act contracts (Figure 3.14-13). No confined animal facilities are located along this alternative alignment. No agricultural conservation easements have been identified within the footprint of the alternative.

Allensworth Bypass Alternative

Most of the land in the vicinity of the Allensworth Bypass Alternative in Tulare County is classified as nonagricultural or natural vegetation and Farmland of Local Importance. In Kern County, most of the land near this alternative is classified as Farmland of Statewide Importance. In Tulare County, most of the land in the vicinity either is not under Williamson Act contract or is under nonrenewable Williamson Act contracts (Figure 3.14-13). In Kern County, most of the land in the vicinity of this alternative is under Williamson Act contracts and a portion is under FSZ contracts (Figures 3.14-13 and 3.14-14). No confined animal facilities are located along this alternative

alignment. No agricultural conservation easements have been identified within the footprint of the Allensworth Bypass Alternative.

Wasco–Shafter Bypass Alternative

Virtually all of the land crossed by the Wasco–Shafter Bypass Alternative is classified as Prime Farmland (Figure 3.14-4). North of Shafter, almost all the land is under Williamson Act contract (Figure 3.14-14). No confined animal facilities are located along this alternative alignment. No agricultural conservation easements have been identified within the footprint of the Wasco–Shafter Bypass Alternative.

Bakersfield South Alternative

The Bakersfield South Alternative is located entirely within the Bakersfield urban area that does not include farmlands (Figure 3.14-5).

Bakersfield Hybrid Alternative

The Bakersfield South Alternative is located entirely within the Bakersfield urban area that does not include farmlands (Figure 3.14-5).

Stations

Kings/Tulare Regional Station–East Alternative

The Kings/Tulare Regional Station–East Alternative is located on land classified as Farmland of Statewide Importance (Figure 3.14-2). This land is not under Williamson Act or FSZ contract (Figure 3.14-12). No confined animal facilities are adjacent to or within 100 feet of this site. No agricultural conservation easements have been identified within the footprint of the Kings/Tulare Regional Station–East Alternative. The Kings/Tulare Regional Station–East site is located in unincorporated Kings County in an area designated in the Kings County General Plan as Urban Fringe. The site is in the Secondary Sphere of Influence of the city of Hanford (see Section 3.13.4, Station Planning, Land Use, and Development for additional land use information).

Kings/Tulare Regional Station–West Alternative

Both of the alternative sites for the Kings/Tulare Regional Station–West are on lands under Williamson Act contract that is in nonrenewal (Figure 3.14-12). No confined animal facilities are adjacent to or within 100 feet of these sites. Land is classified as Prime Farmland or unclassified and none of the land is known to be in an agricultural conservation easement. The station sites are primarily in unincorporated Kings County, with a small portion of the at-grade site for the Hanford West Bypass 1 and 2 alternatives located in the city limits of Hanford. The station sites are within the City of Hanford General Plan's planning area and the city's Primary Sphere of Influence (see Section 3.13.4, Station Planning, Land Use, and Development for additional land use information).

Heavy Maintenance Facility

Fresno Works–Fresno HMF Site

The northern portion of the Fresno Works–Fresno HMF Site is within the city limits of Fresno and is not classified as farmland. The southern portion of the site is classified primarily as Prime Farmland and has some Farmland of Statewide Importance (Figure 3.14-1). The site is not under Williamson Act contract. No confined animal facilities are adjacent to or within 100 feet of this

alternative. No agricultural conservation easements have been identified within the site. The site is used primarily for vegetable crops, plant and seed nurseries, and berry crops.

Kings County–Hanford HMF Site

Most of the Kings County–Hanford HMF Site is located on land classified as Farmland of Statewide Importance (Figure 3.14-2). Approximately 46% of the site is under Williamson Act contract and the other 54% is under FSZ (Figure 3.14-12). One confined animal facility is located adjacent to the site (Figure 3.14-2). No agricultural conservation easements have been identified within the site. The site is used for field crops and pasture.

Kern Council of Governments–Wasco HMF Site

The Kern Council of Governments–Wasco HMF Site is classified as Prime Farmland (Figure 3.14-4). The site is not under Williamson Act contract. No confined animal facilities are adjacent to or within 100 feet of this site. No agricultural conservation easements have been identified within the site. The site is used primarily for field crops, grain, and hay crops. The site is partially within the city of Wasco and partially within unincorporated Kern County, and is zoned as Heavy Industrial and Agriculture.

Kern Council of Governments–Shafter East HMF Site

The Kern Council of Governments–Shafter East HMF Site is classified as Prime Farmland (Figure 3.14-4). The site is not under Williamson Act contract. No confined animal facilities are adjacent to or within 100 feet of this site. No agricultural conservation easements have been identified within the site. The site is used for fruit and nut orchards.

Kern Council of Governments–Shafter West HMF Site

The Kern Council of Governments–Shafter West HMF Site has the same agricultural land characteristics as the Shafter East HMF site described above.

3.14.5 Environmental Consequences

This section describes the potential effects on agricultural lands for the project alternatives. Section 3.14.7, Mitigation Measures, summarizes the mitigation measures for impacts to agricultural lands.

3.14.5.1 Overview

The No Project Alternative would result in extensive farmland conversion to accommodate anticipated future growth in the region. In comparison, the HST alternatives would convert farmland for construction of the project but would also provide opportunities for focusing future growth on land that is already urbanized, approved for development but not built on, or planned for urban uses. This could reduce the amount of farmland converted to urban uses to accommodate future growth within the region.

Table 3.14-5 shows the potential permanent conversion of Important Farmlands with the combination of the project footprint and noneconomic remnants (by category) for the HST. Table 3.14-6 lists the total acres of protected farmlands (Williamson Act and Farmland Security Zone) affected by project alignment alternatives, including remnant parcels that would likely not be suitable for farming after the project is completed. Changes in the acreage numbers in Tables 3.14-5 and 3.14-6 are due to project design refinements that altered the total amount of Important Farmland and farmland under Williamson Act and Farmland Security Zone contracts.

Parcel maps with the alternative alignments on them are provided in Appendix 3.1-A. The BNSF Alternative would permanently convert 3,541 acres of Important Farmland to nonagricultural use. The Hanford West Bypass 1, Hanford West Bypass 1 Modified, Hanford West Bypass 2, and Hanford West Bypass 2 Modified alternatives would decrease farmland impacts by 370, 243, 357, and 178 acres, respectively, in comparison to the BNSF Alternative, which travels to the east of Hanford. The Corcoran Elevated Alternative would decrease impacts on Important Farmland by 129 acres when compared with the BNSF Alternative. The Corcoran Bypass, Allensworth Bypass, and Wasco-Shafter Bypass alternatives would decrease the acreage of Important Farmland converted to nonagricultural use relative to the BNSF Alternative by 35, 32, and 105 acres, respectively. The Bakersfield South and Bakersfield Hybrid alternatives pass through an urban area and would not affect Important Farmland, as would the segments of the BNSF Alternative that correspond to the Bakersfield South and Bakersfield Hybrid alternatives.

All alternatives would convert Grazing Land and land zoned for agricultural use, and would sever farmland parcels because they traverse areas not adjacent to transportation corridors. It does not appear that any of the alternatives would affect agricultural conservation easements. Wind effects on bees and adjacent cropland would be of negligible intensity under NEPA and not affect agricultural productivity, including pollination by bees. Noise from HST operations could impact livestock and poultry where the HST is within 100 feet of confined animal facilities. The impacts on livestock and poultry could have an indirect effect on farmland conversion that is of substantial intensity under NEPA.

Table 3.14-5
Maximum Amount of Important Farmlands Permanently Affected by Each Alternative Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a, b]

County / Alternative Alignment	County / Important Farmland Classification				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Fresno County					
BNSF Alternative	490	58	157	87	792
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	-86	17	-54	2	-121
Hanford West Bypass 1 Modified Alternative	-79	20	-53	3	-109
Hanford West Bypass 2 Alternative	-86	17	-54	2	-121
Hanford West Bypass 2 Modified Alternative	-79	20	-53	3	-109
Corcoran Elevated Alternative	0	0	0	0	0
Corcoran Bypass Alternative	0	0	0	0	0

Table 3.14-5

Maximum Amount of Important Farmlands Permanently Affected by Each Alternative Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a, b]

County/ Alternative Alignment	County/ Important Farmland Classification				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Allensworth Bypass Alternative	0	0	0	0	0
Wasco-Shafter Bypass Alternative	0	0	0	0	0
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0
Kings County					
BNSF Alternative	300	555	118	0	973
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	-47	-205	3	0	-249
Hanford West Bypass 1 Modified Alternative	19	-211	58	0	-134
Hanford West Bypass 2 Alternative	-46	-200	10	0	-236
Hanford West Bypass 2 Modified Alternative	40	-156	47	0	-69
Corcoran Elevated Alternative	0	-19	0	0	-19
Corcoran Bypass Alternative	0	88	2	0	90
Allensworth Bypass Alternative	0	0	0	0	0
Wasco-Shafter Bypass Alternative	0	0	0	0	0
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0

Table 3.14-5
Maximum Amount of Important Farmlands Permanently Affected by Each Alternative Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a, b]

County / Alternative Alignment	County / Important Farmland Classification				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Tulare County					
BNSF Alternative	0	609	1	109	719
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	0	0	0	0	0
Hanford West Bypass 1 Modified Alternative	0	0	0	0	0
Hanford West Bypass 2 Alternative	0	0	0	0	0
Hanford West Bypass 2 Modified Alternative	0	0	0	0	0
Corcoran Elevated Alternative	0	-110	0	0	-110
Corcoran Bypass Alternative	0	-125	0	0	-125
Allensworth Bypass Alternative	0	43	1	-22	22
Wasco-Shafter Bypass Alternative	0	0	0	0	0
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0
Kern County					
BNSF Alternative	957	93	5	0	1,055
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	0	0	0	0	0
Hanford West Bypass 1 Modified Alternative	0	0	0	0	0
Hanford West Bypass 2 Alternative	0	0	0	0	0

Table 3.14-5
Maximum Amount of Important Farmlands Permanently Affected by Each Alternative Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a, b]

County/ Alternative Alignment	County/ Important Farmland Classification				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Hanford West Bypass 2 Modified Alternative	0	0	0	0	0
Corcoran Elevated Alternative	0	0	0	0	0
Corcoran Bypass Alternative	0	0	0	0	0
Allensworth Bypass Alternative	-137	81	2	0	-54
Wasco-Shafter Bypass Alternative	105	0	0	0	105
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0
Total Impacts for All Counties by Important Farmland Classification					
BNSF Alternative	1,747	1,315	282	197	3,541
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	-133	-188	-51	2	-370
Hanford West Bypass 1 Modified Alternative	-60	-191	5	3	-243
Hanford West Bypass 2 Alternative	-132	-183	-44	2	-357
Hanford West Bypass 2 Modified Alternative	-39	-136	-6	3	-178
Corcoran Elevated Alternative	0	-129	0	0	-129
Corcoran Bypass Alternative	0	-37	2	0	-35
Allensworth Bypass Alternative	-137	124	3	-22	-32
Wasco-Shafter Bypass Alternative	-105	0	0	0	-105

Table 3.14-5
Maximum Amount of Important Farmlands Permanently Affected by Each Alternative Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a, b]

County/ Alternative Alignment	County/ Important Farmland Classification				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0

[a] Acreages are rounded to the nearest whole number.

[b] These totals reflect the combination of the project footprint and the noneconomic remnant parcels.

Note: Table has been reformatted from the Draft EIR/EIS and Revised Draft EIR/Supplemental Draft EIS to incorporate the Hanford West Bypass 1 Modified and Hanford West Bypass 2 Modified alternatives in the table. With the addition of these alternatives the previous table format would have been too large for the overall document formatting.

Table 3.14-6
Protected Farmland Permanently Converted by Each Alignment in Comparison to the Corresponding Segment of the BNSF Alternative (acres)[a]

Alternative	Williamson Act Land Acres[a]	Williamson Act Parcels[b]	FSZ Land Acres[a]	FSZ Parcels[b]
BNSF Alternative	2,096	639	358	96
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative				
Hanford West Bypass 1 Alternative	-196	157	-232	-38
Hanford West Bypass 1 Modified Alternative	-189	225	-225	-44
Hanford West Bypass 2 Alternative	-253	150	-181	-12
Hanford West Bypass 2 Modified Alternative	-147	247	-174	-15
Corcoran Elevated Alternative	-114	-31	15	4
Corcoran Bypass Alternative	-113	-17	57	22
Allensworth Bypass Alternative	-10	38	-8	1
Wasco–Shafter Bypass Alternative	-13	-20	0	0
Bakersfield South Alternative	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0

[a] Acreages are rounded to the nearest whole number. The acreages listed do not include farmland under nonrenewable Williamson Act contracts.

FSZ = Farmland Security Zone

None of the station alternatives in Fresno or Bakersfield would impact Important Farmlands or land under either a Williamson Act or FSZ contract. The Kings/Tulare Regional Station-East would impact a total of 22 acres of Important Farmland. The Kings/Tulare Regional Station-West would impact a total of 38 acres of Important Farmland and 18 acres of land under Williamson Act contract. The HMF facility is expected to cover approximately 154 acres. Potential HMF sites in the Fresno to Bakersfield Section ranging from 420 to 590 acres have been identified. The specific location of the HMF within any of these sites is not currently known. The acreage of Important Farmland within each HMF site is provided in Table 3.14-7. Only the Hanford HMF site contains protected farmland, with 220 acres in Williamson Act contracts and 251 acres in FSZ contracts.[5] As indicated in the table, it is expected that construction of an HMF at any of the sites would result in the conversion of Prime Farmland and/or Farmland of Statewide Importance to nonagricultural use. If the HMF is not sited in the Fresno to Bakersfield Section of the HST System, then the co-located maintenance-of-way facility would be situated in either the Shafter East or Shafter West HMF site alternatives. This maintenance-of-way facility would have the same potential effects as those identified for the HMFs in these locations.

Table 3.14-7
Important Farmlands within Potential Heavy Maintenance Facility Alternative Sites (acres)[a]

HMF Alternative Sites	Important Farmlands				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Total
Fresno Works–Fresno (590 acres)	382	0	0	8	390
Kings County–Hanford (510 acres)	80	304	101	0	485
Kern COG–Wasco (420 acres)	409	0	0	0	409
Kern COG–Shafter East (490 acres)	489	0	0	0	489
Kern COG–Shafter West (480 acres)	455	0	0	0	455

Note:
[a] Acreages are rounded to the nearest whole number.

Acronyms:
COG = Council of Governments
HMF = heavy maintenance facility

3.14.5.2 No Project Alternative

As discussed in Chapter 1, Project Purpose, Need, and Objectives, and Section 3.18, Regional Growth, the San Joaquin Valley population continues to grow. To accommodate this growth, conversion of farmland to other uses, such as residential developments and transportation infrastructure, continues. Section 3.19, Cumulative Impacts, discusses foreseeable future

[5] The Kern Council of Governments–Shafter East and Shafter West HMF sites are under nonrenewable Williamson Act contract.

projects, which include residential, commercial, and industrial developments and transportation infrastructure. These projects are planned or approved, and future development pursuant to local land use plans would result in conversion of Prime and Unique Farmland and Farmland of Statewide or Local Importance.

Under the No Project Alternative, population growth would be commensurate with regional growth forecasts (see Section 2.4.1, No Project Alternative). Using the methods in Section 2.4.1 for relating population growth to conversion of farmland, regional growth forecasts indicate development of approximately 56,500 acres occurring in Fresno County, 11,800 acres in Kings County, 36,200 acres in Tulare County, and 68,400 acres in Kern County by 2035. With implementation of the SB 375-compliant regional transportation plans and SCSs, the extent of this conversion may be reduced. However, since SB 375-compliant SCSs have not yet been adopted and there are no data about their potential effectiveness, it is not known whether SCSs will effectively change this pattern of farmland conversion.

The eight San Joaquin Valley counties that participated in the San Joaquin Valley Blueprint planning process developed a forecast of farmland conversion to nonagricultural uses by 2050 based on current development patterns. Given continuation of these patterns, 327,000 acres of farmland would be converted by 2050 (San Joaquin Valley Regional Planning Agencies 2009).

Given the extent and quality of farmland in these counties, most of this growth is likely to occur on Important Farmlands because a majority of non-urban land in the counties is classified as Important Farmland (Figures 3.14-1 to 3.14-5). Local and regional growth management and land use plans encourage infill and higher-density development in urban areas and concentration of future nonagricultural uses around transit corridors, which would help reduce the conversion of Important Farmland. The SB 375-compliant SCSs are expected to similarly encourage infill. These higher-density land use scenarios may include the HST project as a critical element in meeting these land use goals. Under the No Project Alternative, cities would have a more difficult time reducing low-density sprawl and encouraging higher-density development.

As shown in Appendix 3.19-A, most development that is currently being planned or permitted in the southern San Joaquin Valley is located in the vicinity of urban centers and/or along SR 99. Most of this development would take place on currently unincorporated county land that is largely classified as Prime Farmland. A total of approximately 5,100 acres of farmland would be converted to nonagricultural uses by development planned or permitted within 2 miles of the Fresno to Bakersfield Section alternatives by 2035.

Indirectly, urbanized area encroachment affects agricultural operations by constraining activities such as the spraying of fertilizers and pesticides or reducing operating hours for farm equipment. Where residential development is adjacent to farms, residents complain of odor and noise from agricultural equipment.

As stated above in Table 3.14-1 all county general plans provide provisions for protection of agricultural lands.

3.14.5.3 High-Speed Train Alternatives

This section evaluates direct and indirect impacts to agricultural land that would result from each HST alternative. Impacts during construction are temporary, such as temporary construction staging, because they will cease when construction is completed. Project impacts, such as conversion of agricultural lands for the HST alignment and associated facilities, are permanent because these lands would remain in nonagricultural use. The project would compensate property owners and tenants in accordance with statutory requirements, which apply to all real property including the acquisition of farmland whether converted to other uses or because of severance. (For a discussion of property acquisition, including the Uniform Relocation Assistance

and Real Properties Acquisition Policy Act and the California Relocation Assistance Act, see Section 3.12, Socioeconomics, Communities, and Environmental Justice.)

Construction Period Impacts

Project implementation would include purchasing rights-of-way, constructing the project, and testing the HSTs. Heavy construction (such as grading, excavating, constructing the HST railbed, and laying the tracks) would occur over about a 4 year period. Chapter 2, Alternatives, describes the expected construction schedule.

Common Agricultural Land Impacts

The construction of any of the project alternatives would require the temporary use of agricultural land outside the permanent right-of-way, and would result in disruption of some utilities and infrastructure and in the temporary disturbance of dairies. The following sections discuss the potential effects of each alternative.

Impact AG #1 – Temporary Use of Agricultural Land

Some agricultural land outside of the permanent right-of-way would be used for construction activities, such as staging areas and material laydown areas. This land would be leased from the landowner and used for 1 to 3 years for construction. After construction, the land would be restored by the design/build contractor to as close to its pre-construction condition as possible. These impacts have negligible intensity under NEPA and are less than significant under CEQA because the land would be used temporarily and restored and would not be permanently converted to a nonagricultural use.

BNSF Alternative. Table 3.14-8 presents estimates of the temporary use of Important Farmlands under the BNSF Alternative and comparisons of the other alignment alternatives to the BNSF Alternative. Most of this land is classified as Prime Farmland. Because this land would be restored and returned to agricultural use after project construction is completed, it would not be permanently converted to nonagricultural uses; therefore, the temporary use of farmland for project construction is considered to have impacts with negligible intensity under NEPA and less-than-significant impacts under CEQA.

Table 3.14-8
Important Farmland Temporarily Used for Project Construction (acres)[a]

HST Alternative Alignment	Important Farmlands				Total
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	
BNSF Alternative	834	679	50	3	1,566
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative					
Hanford West Bypass 1 Alternative	–91	–289	–37	1	–416
Hanford West Bypass 1 Modified Alternative	–89	–290	–38	1	–416
Hanford West Bypass 2 Alternative	–91	–281	–38	1	–409

Table 3.14-8
Important Farmland Temporarily Used for Project Construction (acres)[a]

HST Alternative Alignment	Important Farmlands				Total
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	
Hanford West Bypass 2 Modified Alternative	–89	–219	–36	1	–343
Corcoran Elevated Alternative	0	–1	0	0	–1
Corcoran Bypass Alternative	0	23	0	0	23
Allensworth Bypass Alternative	–127	115	–1	–1	–14
Wasco–Shafter Bypass Alternative	–197	0	0	0	–197
Bakersfield South Alternative	0	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0	0

Note:
[a] Acreages are rounded to the nearest whole number.

Hanford West Bypass 1 Alternative. The Hanford West Bypass 1 would temporarily impact 416 fewer acres of Important Farmland than the comparable segment of the BNSF Alternative. By itself, the bypass would impact 115 acres of Important Farmland that would be restored and returned to agricultural use after construction is completed. These impacts are considered to have a negligible intensity under NEPA and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Hanford West Bypass 1 Modified Alternative. The Hanford West Bypass 1 Modified would also temporarily impact 416 fewer acres of Important Farmland than the comparable segment of the BNSF Alternative. By itself, the bypass would impact 114 acres of Important Farmland that would be restored and returned to agricultural use after construction is completed. These impacts are considered to have a negligible intensity under NEPA, and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Hanford West Bypass 2 Alternative. The Hanford West Bypass 2 would temporarily use 122 acres of Important Farmland or 409 fewer acres than the comparable segment of the BNSF Alternative. This land would be restored and returned to agricultural use after construction is completed. These impacts are considered to have a negligible intensity under NEPA and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Hanford West Bypass 2 Modified Alternative. The Hanford West Bypass 2 Modified Alternative would temporarily use 188 acres of Important Farmland or 343 fewer acres than the comparable segment of the BNSF Alternative. This land would be restored and returned to agricultural use after construction is completed. Therefore, these impacts are considered to have a negligible intensity under NEPA and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Corcoran Elevated Alternative. The Corcoran Elevated Alternative passes through the city of Corcoran directly adjacent to the BNSF Alternative. The alternative will use 311 acres of Important Farmland for temporary construction which is 1 acre less than the corresponding segment of the BNSF Alternative. This land would be restored and returned to agricultural use after construction is completed. These impacts are considered to have a negligible intensity under NEPA and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Corcoran Bypass Alternative. The Corcoran Bypass Alternative would temporarily use 335 acres of Important Farmland during construction. This is 23 more acres affected during construction than the acreage of Important Farmland affected by the corresponding segment of the BNSF Alternative. This land would be restored and returned to agricultural use after construction is completed. Therefore, these impacts are considered to have a negligible intensity under NEPA and the impacts are less than significant under CEQA because they do not result in permanently converting the farmlands or permanently disrupting agricultural uses.

Allensworth Bypass Alternative. The Allensworth Bypass Alternative would temporarily use 134 acres of Important Farmland during construction. This is 14 fewer acres of Important Farmland affected during construction than the acreage affected by the corresponding segment of the BNSF Alternative. This impact would have a negligible intensity under NEPA and the impact is less than significant under CEQA because it would not result in permanently converting farmlands or permanently disrupting agricultural uses. The same area of farmland would be temporarily used if the BNSF Railway right-of-way were moved adjacent to the Allensworth Bypass.

Wasco–Shafter Bypass Alternative. The Wasco–Shafter Bypass Alternative would temporarily use 340 acres of Important Farmland during construction. This is 197 fewer acres of Important Farmland affected during construction than the acreage affected by the corresponding segment of the BNSF Alternative. This impact would have a negligible intensity under NEPA and the impact is less than significant under CEQA because it would not result in permanently converting farmlands or permanently disrupting agricultural uses.

Bakersfield South Alternative. The Bakersfield South Alternative would not use any Important Farmland during construction. As a result, there are no adverse farmland effects under NEPA and no farmland impacts under CEQA.

Bakersfield Hybrid Alternative. The Bakersfield Hybrid Alternative would not use any Important Farmland during construction. As a result, there are no adverse farmland effects under NEPA and no farmland impacts under CEQA.

Potential Heavy Maintenance Facility Alternatives. None of the HMF alternatives would use Important Farmland for temporary construction activities. Construction would take place within the permanent footprint of the HMF. As a result, there are no adverse farmland effects under NEPA and no farmland impacts under CEQA.

Impact AG #2 – Temporary Utility and Infrastructure Interruption

Construction of the alignment alternatives and related improvements (e.g., road and irrigation canal and railroad realignments) would affect productive farmland. Each farm maintains a system of onsite utilities needed for operations, such as irrigation systems (e.g., ditches, drains, pipelines, and wells), access roads, and power supplies that could be disrupted by the project during construction. Utility disruptions could jeopardize farm productivity (Authority 2012a).

Appendix 3.12-A describes the expected process for right-of-way acquisition and the rights of property owners under the Uniform Relocation Assistance Program. As part of this process, Authority right-of-way agents would work with each affected property owner to address issues of concern during the appraisal process. The required property appraisal would identify affected utilities, and the agents would attempt to resolve conflicts. For example, the acquisition agreements could require that the contractor relocate the affected utilities before construction, maintain service during construction, or time the disruption to avoid active periods (e.g., during the winter idle period for annual crops). In some cases, the agents may not be able to resolve the conflict. When construction activities cannot avoid a utility, the agent would negotiate a fair compensation for loss of agricultural production. Because utility disruptions would be avoided, resolved, or the land owner compensated for losses during the right-of-way acquisition process, these disruptions are not expected to result in the permanent conversion of Important Farmland to nonagricultural use, and therefore the effect would have a negligible intensity under NEPA and the impact is less than significant under CEQA.

For additional information on large regional utilities, see Section 3.6, Public Utilities and Energy. The analysis of Impact AG #5 below addresses potential project impacts associated with severing parcels.

Impact AG #3 – Temporary Noise and Vibration Effects on Adjacent Farm Animals

Construction of the project would generate noise and vibration from construction equipment and vehicles (e.g., clearing, grading, track installation). Noise levels from project construction are estimated to be 89 dBA L_{eq} at 50 feet for an 8-hour workday (refer to Section 3.4, Noise and Vibration). The FRA threshold for construction noise impacts on commercial land uses, such as confined animal operations, is 85 dBA 8-hour L_{eq} (day or night). At a distance of 100 feet from the track centerline, the 8-hour L_{eq} for project construction at the animal containment facilities on affected confined animal facilities and feedlots would be 83 dBA.

The BNSF Alternative would come within 100 feet of a total of six confined animal facilities (one confined animal facility in Fresno County, three confined animal facilities in Kings County, and two confined animal facilities in Tulare County). Three alternative alignments would also affect these confined animal facilities. The Hanford West Bypass 1 Alternative would affect one confined animal facility in Kings County, and both the Corcoran Bypass and Corcoran Elevated alternatives would affect the same confined animal facility in Kings County and two confined animal facilities in Tulare County.

Research on the effects of noise on confined animal facilities such as dairies and live stock holding areas found that a wide range of studies have been conducted concerning noise and or vibration effects on animals, namely dairy cows. These impacts also could occur in grazing land where cattle are present. Appendix 3.14-C provides more detail about project effects on grazing. Mammals in particular appear to react to noise at sound levels higher than 90dB. General noise at 105 dB, but not at 80 dB, reduced milk yield, rate of milk release, and feed intake by dairy cows (Kovalcik and Sottnik 1971). Responses to loud noises include the startle response, freezing (becoming temporarily stationary), and fleeing from the sound source. As the project construction noise is below the levels identified in the literature to impact milk production, effects

on these confined animal facilities are not anticipated. Temporary noise impacts on adjacent farm animals would therefore not lead to the conversion of Important Farmland to a nonagricultural use, because the current use would continue. The impact would have a negligible intensity under NEPA, and the impact would be less than significant under CEQA.

No criteria have been established for vibration effects on domestic animals or poultry; however, the FRA has established a 75 VdB criterion for ground-borne vibration impacts on institutional land uses (Category 3). Institutional land uses include schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for vibration to cause activity interference. This level of sensitivity to vibration is judged to be appropriate for confined animal facilities as it is deemed appropriate for quiet human activity (Authority 2012b).

Project construction would generate vibration levels of 75 VdB at up to 70 feet from the construction site (refer to Section 3.4, Noise and Vibration). As indicated above, the confined animal facilities and feedlot near the alternatives are approximately 100 feet from the edge of where construction activities would occur. Temporary vibration impacts on adjacent farm animals would therefore not lead to the conversion of Important Farmland to a nonagricultural use, because the current use would continue. Therefore, project construction vibration effects would have a negligible intensity under NEPA, and the impact would be less than significant under CEQA.

Project Impacts

Common Agricultural Land Impacts

All the HST alternatives would result in permanent conversion of Important Farmland to nonagricultural use (including potential conversion from parcel severance), permanent access severance, conflicts with farmland protection contracts (e.g., Williamson Act contracts), and indirect effects on dairies or other confined animal facilities. None of the alternatives would cause adverse wind effects on adjacent agricultural lands nor would they interfere with aerial spraying of the crops.

Impact AG #4 – Permanent Conversion of Agricultural Land to Nonagricultural Use

The project involves construction of rail and associated transportation structures, and other HST facilities (e.g., paralleling stations and HMF access tracks) through areas with Important Farmlands, permanently displacing agricultural uses on these lands. In addition, the HST alternatives would sever large agricultural properties, especially where the alternatives are not directly alongside existing transportation facilities. In many cases, severing the parcels would create two farmable parcels and the only loss of Important Farmland would be from the HST facilities themselves. In some cases, severing the parcels would create small remnant parcels. Depending on the size, shape, access, location, and hardship, these small remnant parcels might not be farmable. In cases where farming is unlikely to continue, these small remnant parcels have been identified in this section as converted farmland. The *Fresno to Bakersfield Section Draft Relocation Impacts Report* (Authority and FRA 2012) explains how analysts reviewed each affected parcel by alternative, considered usable and noneconomic remnants, and made preliminary recommendations for property acquisitions. The farmland conversion reported in this document reflects a 15% design level. As the design develops, this assessment will continue to be updated for the current property acquisition requirements.

Conversion of agricultural lands would occur along each of the project alternatives. Table 3.14-5 summarizes the impacts to Important Farmland (acres converted). The following discussion of alternatives presents the results calculated by the NRCS-CPA-106 farmland conversion evaluation for each county. More detail on the NRCS-CPA-106 farmland conversion evaluation is presented

in Appendix 3.14-A. Permanently converting Important Farmland to nonagricultural uses would have a substantial intensity under NEPA and a significant impact under CEQA.

The project also would affect Grazing Land, as described for each of the alternatives below. Grazing Land is not included in the definition of Important Farmland.

As discussed in Chapter 1, Project Purpose, Need, and Objectives, and in Section 3.18, Regional Growth, the HST System would ease the pressure on the state's agricultural land base by reducing the need for expanding airports and freeways. By offering a new transportation option that would bring large numbers of people to the downtown stations, the project would provide an opportunity to create transit centers in the central business districts where mixed land uses (residential, commercial, and business uses) and urban densities are best suited. If the communities zone to take advantage of this increase in land values, the growth can be redirected to limit low-density development, which has been consuming large amounts of land area. There is an opportunity to encourage walkable, more-concentrated development patterns to meet new growth demands and reduce the rate and occurrence of low-density development, which erodes the valuable land resources. Providing opportunities for focusing future development on land that is already in nonagricultural uses would reduce the amount of farmland converted to uses other than agriculture. This would be consistent with the preferred B+ (Blueprint) Scenario, which incorporates the HST System, and farmland conversion would be reduced from 327,000 acres (the business-as-usual, or "A" Scenario) to 209,000 acres, a reduction of 118,000 acres. The SB 375-compliant SCSs or APSs, which are expected to encourage similar land use patterns and limit sprawl, would similarly benefit from the HST stations. The project's expected contribution to this reduction in agricultural lands converted in the future would be a potential beneficial effect under each HST alternative.

BNSF Alternative. Table 3.14-5 presents the estimates of the permanent conversion of Important Farmlands under the BNSF Alternative, based on the land that would be permanently converted as a result of the project right-of-way and ancillary facilities, such as substations and parcels that were identified to be noneconomic remnants. Approximately 3,541 acres of Important Farmlands would be converted, including approximately 435 acres consisting of noneconomic remnants from the 271 parcels that are not expected to remain suitable for continued agricultural use based on the methodology discussed above. The farmland conversion impact rating, by county, for the BNSF Alternative is provided in Table 3.14-9. The NRCS-CPA-106 forms gave farmland conversion rating for all counties; only Tulare County had a score below the 160 point threshold for consideration of other alternatives (Table 3.14-9). The BNSF Alternative would also convert 54 acres of Grazing Land to nonagricultural uses (which is not in the definition of Important Farmland). The conversion of the Important Farmland to a nonagricultural use would be an impact with a substantial intensity under NEPA and a significant impact under CEQA.

Table 3.14-9
Farmland Conversion Impact Rating for the BNSF Alternative in Fresno, Kings, Tulare, and Kern Counties

County	Farmland Conversion Impact Rating
Fresno	178
Kings	172
Tulare	156
Kern	178

Hanford West Bypass 1 Alternative. The Hanford West Bypass 1 Alternative would result in the permanent conversion of 331 acres of Prime Farmland, 343 acres of Farmland of Statewide Importance, 158 acres of Unique Farmland, and 3 acres of Farmland of Local Importance. Included in the above totals are 112 acres of farmland that would be lost from noneconomic remnant parcels. One parcel with grazing land would be affected from the alignment. This total of 834 acres of Important Farmland affected by the Hanford West Bypass 1 Alternative is less than the 1,203 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 369 fewer acres of Important Farmland affected. The NRCS-CPA-106 farmland conversion rating for Fresno County is 171 while Kings County had a rating of 177. The conversion of Important Farmland to a nonagricultural use by the Hanford West Bypass 1 would have a substantial intensity under NEPA and a significant impact under CEQA.

Hanford West Bypass 1 Modified Alternative. The Hanford West Bypass 1 Modified Alternative would result in the permanent conversion of 403 acres of Prime Farmland, 340 acres of Farmland of Statewide Importance, 212 acres of Unique Farmland, and 3 acres of Farmland of Local Importance. Included in the above totals are 167 acres of farmland that would be lost from noneconomic remnant parcels. One parcel with grazing land would be affected by the alignment. This total of 959 acres of Important Farmland affected by the Hanford West Bypass 1 Modified Alternative is less than the 1,203 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 244 fewer acres of Important Farmland affected. The NRCS-CPA-106 farmland conversion rating for Fresno County is 171 while Kings County has a rating of 177.The conversion of Important Farmland to a nonagricultural use by the Hanford West Bypass 1 Modified would have a substantial intensity under NEPA and a significant impact under CEQA.

Hanford West Bypass 2 Alternative. The Hanford West Bypass 2 Alternative would result in the permanent conversion of 332 acres of Prime Farmland, 349 acres of Farmland of Statewide Importance, 164 acres of Unique Farmland, and 2 acres of Farmland of Local Importance. Included in the above totals are 127 acres of farmland that would be lost from noneconomic remnant parcels. One parcel with grazing land would be affected by the alignment. This total of 847 acres of Important Farmland affected by the Hanford West Bypass 2 Alternative is less than the 1,203 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 356 fewer acres of Important Farmland affected. The NRCS-CPA-106 farmland conversion rating for Fresno County is 171 while Kings County has a rating of 183. The conversion of Important Farmland to a nonagricultural use by the Hanford West Bypass 2 would have a substantial intensity under NEPA and a significant impact under CEQA.

Hanford West Bypass 2 Modified Alternative. The Hanford West Bypass 2 Modified Alternative would result in the permanent conversion of 422 acres of Prime Farmland, 376 acres

of Farmland of Statewide Importance, 202 acres of Unique Farmland, and 3 acres of Farmland of Local Importance. Included in the above totals are 193 acres of farmland that would be lost from noneconomic remnant parcels. One parcel with grazing land would be affected by the alignment. This total of 1,025 acres of Important Farmland affected by the Hanford West Bypass 2 Modified Alternative is less than the 1,203 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 178 fewer acres of Important Farmland affected. The NRCS-CPA-106 farmland conversion rating for Fresno County is 171 while Kings County has a rating of 183.The conversion of Important Farmland to a nonagricultural use by the Hanford West Bypass 2 Modified would have a substantial intensity under NEPA and a significant impact under CEQA.

Corcoran Elevated Alternative. The Corcoran Elevated Alternative passes through the city of Corcoran and affects a total of 169 acres of Farmland of Statewide Importance. No other agricultural lands are affected. Included in the above totals are 31 acres of land that would be lost from noneconomic remnant parcels. This total of 169 acres of Important Farmland affected by the Corcoran Elevated Alternative Alignment is less than the 298 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 129 fewer acres of Important Farmland affected. The NRCS-CPA-106 farmland conversion rating for Kings County is 174 while Tulare County has a rating of 157. The conversion of Important Farmland to a nonagricultural use by the Corcoran Elevated Alternative Alignment would have a substantial intensity under NEPA and a significant impact under CEQA.

Corcoran Bypass Alternative. The guideway and ancillary facilities for the Corcoran Bypass Alternative would result in the permanent conversion of 261 acres of Farmland of Statewide Importance and 2 acres of Unique Farmland. Included in the above totals are 41 acres of Farmland of State Importance that would be lost from noneconomic remnant parcels. This total of 263 acres of Important Farmland affected by the Corcoran Bypass Alternative is less than the 298 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 35 fewer acres of Important Farmland affected. The Corcoran Bypass Alternative would affect one parcel with grazing land. The NRCS-CPA-106 farmland conversion rating for Kings County is 176 while Tulare County has a rating of 154. The conversion of Important Farmland that would be converted to a nonagricultural use by the Corcoran Bypass Alternative would have a substantial intensity under NEPA and a significant impact under CEQA.

Allensworth Bypass Alternative. The guideway and ancillary facilities for the Allensworth Bypass Alternative would result in the permanent conversion of 85 acres of Prime Farmland, 302 acres of Farmland of Statewide Importance, 8 acres of Unique Farmland, and 87 acres of Farmland of Local Importance. This total of 482 acres of Important Farmland affected by the Allensworth Bypass Alternative is less than the 516 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 34 fewer acres of Important Farmland affected. Included in the above totals are parcel splits that would preclude farming on 78 acres of Important Farmland. The Allensworth Bypass Alternative would not affect grazing land. The NRCS-CPA-106 farmland conversion rating for Tulare County is 160 while Kern County has a rating of 168. The conversion of Important Farmland that would be converted to a nonagricultural use by the Allensworth Bypass Alternative would have a substantial intensity under NEPA and a significant impact under CEQA.

Wasco–Shafter Bypass Alternative. The guideway and ancillary facilities for the Wasco–Shafter Bypass Alternative would result in the permanent conversion of 574 acres of Prime Farmland. This total of 574 acres of Important Farmland affected by the Wasco-Shafter Bypass Alternative is less than the 678 acres of Important Farmland affected by the comparative portion of the BNSF Alternative, which results in 104 fewer acres of Important Farmland affected. This alternative could also preclude farming on 161 acres of Prime Farmland that were included in the above totals. The Wasco–Shafter Bypass Alternative would convert 5 acres of grazing land to

nonagricultural use. The NRCS-CPA-106 farmland conversion rating for Kern County is 182. The conversion of Important Farmland that would be converted to a nonagricultural use by the Wasco–Shafter Bypass Alternative would have a substantial intensity under NEPA and a significant impact under CEQA.

Bakersfield South Alternative. The guideway and ancillary facilities for the Bakersfield South Alternative would result in the permanent conversion of 31 acres of grazing land and would not result in any remnant parcels that could not be farmed. This alternative would affect 12 fewer acres of grazing land than would the corresponding segment of the BNSF Alternative. The NRCS-CPA-106 farmland conversion rating for Kern County is 179. The Bakersfield South Alternative would not convert Important Farmland to nonagricultural uses; therefore, it would have a negligible intensity under NEPA and a less-than-significant impact under CEQA.

Bakersfield Hybrid Alternative. The guideway and ancillary facilities for the Bakersfield Hybrid Alternative are the same as those of the Bakersfield South Alternative Alignment. The NRCS-CPA-106 farmland conversion rating for Kern County is 180. The Bakersfield Hybrid Alternative would not convert Important Farmland to nonagricultural uses; therefore, it would have a negligible intensity under NEPA and a less-than-significant impact under CEQA.

Potential Heavy Maintenance Facility Alternatives. Table 3.14-7 presents the acreage of farmland affected by each HMF site. Within each site, the HMF and associated tracks would occupy approximately 154 acres of land. While the precise location of HMF facilities within each alternative site is not known at this time, the facilities would be near the trackway.

The conversion of Important Farmlands for any HMF site in the Fresno to Bakersfield Section would be in addition to the conversion caused by the HST trackway and other facilities. Because all alternative alignments that have any HMF located along them already have a substantial intensity an HMF would augment the intensity under NEPA and would be a significant impact under CEQA.

Impact AG #5 – Effects on Agricultural Land from Parcel Severance

In addition to conversion of Important Farmland from placement of the HST infrastructure, the analysis also considers whether parcel severance would lead to further conversion of Important Farmland. As previously discussed, the HST alternative alignments would convert Important Farmland to a nonagricultural use. The alignments follow existing transportation corridors (i.e., SR 43, UPRR, and BNSF) as much as possible, but in some cases the alignments deviate from those corridors and bisect agricultural parcels. The reasons for these deviations include maintaining mandated travel times, optimizing the location of a Kings/Tulare Regional Station, and reducing impacts on urban areas, waters of the U.S., and habitat for threatened or endangered species; these reasons are discussed in more detail in Chapter 2, Project Description. Alignments deviating from existing transportation facilities would bisect parcels. Some of the remnant parcels would be too small to maintain economic activity. The analysis under Impact AG # 4 assumes that the Authority would acquire these noneconomic remainder parcels and they would be permanently converted to a nonagricultural use. This acreage is included in the permanent conversion data discussed above. Nevertheless, the Authority has committed to implement a Farmland Consolidation Program as part of the HST project, and will attempt to transfer these noneconomic remainder parcels to neighboring landowners wherever possible to consolidate with adjacent parcels. (Authority, Resolution 12-20 and attachments, May 3, 2012.)

This analysis of parcel severance identified that other remainder parcels would be of sufficient size to maintain economic activity and would not be converted away from agricultural use, or that they could readily be consolidated with adjacent parcels in a manner that would allow agricultural

operations to continue because land in the San Joaquin Valley is among the most valuable agricultural land in the United States.

Size was not the only factor used to determine if remainder parcels would be at risk for permanent conversion to a nonagricultural use. The analysis considered whether diagonal alignments could cause hardships in maintaining economic activity on otherwise viable parcels in a manner that could lead to agricultural land conversion to a nonagricultural use. For example, a remainder parcel may become isolated from the farm activity center, requiring farm workers (and farm equipment) to travel increased distances to access their property, resulting in increased costs. In addition, the strict nature of air quality permits in the Central Valley may also obligate farmers to amend or revise the current air quality permit to account for the increased distance traveled to farm parcels on opposite sides of the HST. Farmers may also lose productivity because of the new shape of the parcels. This is because farmers consider crop direction so that they can maximize their crop yield and decrease the amount of land used for vehicle turnaround and storage. With the HST severing their parcels, farmers may need to plant their crops in a different direction to maximize their yield or use a larger percentage of their land for roads in order to maneuver equipment.

The project design reduces the costs of increased travel distances by providing alignment crossings on public roads. As described in Chapter 2, and listed in Appendix 2-A, grade-separated crossings (typically overpasses) would occur at intervals of approximately 1 to 2 miles. The specifications are based on county road standards with shoulders 4 to 8 feet wide, depending on average daily traffic (ADT) volumes. The paved surface for vehicles would therefore range from 32 to 40 feet wide with a minimum clearance of 27 feet over the HST. Increased travel to reach a severed parcel across the HST right of way is therefore not anticipated to result in the permanent conversion of more Important Farmland than identified above (Authority 2012c).

In addition, the right-of-way acquisition process provides additional opportunities to reduce hardships caused by parcel severance. As part of this process, the Authority's right-of-way agents will work with each affected property owner to address issues of concern as discussed in the Outreach Materials prepared by the Authority (Authority 2013). Agents would attempt to resolve conflicts, for example by arranging additional property transfers to consolidate ownership through the Farmland Consolidation Program. For large properties, agents may be able to arrange for additional grade-separated crossings (e.g., underpasses or small overpasses). The agents may not be able to resolve all issues, and may offer compensation to landowners that demonstrate a hardship from parcel severance. Considering that agricultural land in the San Joaquin Valley is among the most valuable agricultural land in the United States, it is anticipated that while parcel ownership may change due to severance, the larger remnant parcels from parcel severance would remain in agricultural use. This impact would therefore have a negligible intensity under NEPA and be less than significant under CEQA. For additional information on the right-of-way acquisition process, see Section 3.12, Socioeconomics, Communities, and Environmental Justice.

Impact AG #6 – Effects on Land under Williamson Act or FSZ Contracts, Local Zoning, or Conservation Easement Lands

This analysis also considers whether the HST project's effects on parcels under Williamson Act or FSZ contracts, local zoning, or conservation easements, could lead to additional conversion of Important Farmlands to nonagricultural use. Parcels required for the project that are under Williamson Act or FSZ contracts would be subject to property acquisition in accordance with the applicable provisions of the programs. Williamson Act and FSZ contracts provide tax incentives for parcels that remain in agricultural production. Partial acquisitions of Williamson Act or FSZ properties might result in remaining portions of the parcels staying under Williamson Act contracts if minimum acreage requirements established by the local jurisdiction are met. These requirements vary by county, parcel size, and land quality.

A partial acquisition of land protected by Williamson Act or the FSZ contract could constrain the potential continued use of that land for farming because (1) the remaining land acreage might be too small to meet the minimum requirements under these programs, and (2) the resulting increase in property taxes on such land might affect the financial feasibility of continued farming. Although it could be possible to combine adjacent farmlands, this approach might not be feasible because of variations in topography and soils between adjacent farms. This would potentially result in Important Farmland converting to nonagricultural uses. As previously discussed, farmland conversion is a significant impact of each alternative except for Bakersfield South and Bakersfield Hybrid alternatives, which are located in an urban area. The potential impact for the project to cause removal of lands from Williamson Act or FSZ contracts and therefore the potential conversion of Important Farmlands to nonagricultural uses, beyond the lands needed for the HST project facilities, is considered to have a substantial intensity under NEPA and the impact is significant under CEQA.

Local zoning codes and general plan policies also protect most of the Important Farmlands discussed above for agricultural use. Section 3.13, Station Planning, Land Use, and Development, addresses the project's consistency with local zoning and general plan policies for the protection and preservation of agricultural lands.

Agricultural conservation easements provide permanent protection for high-quality farmlands. Available information from the Department of Conservation, the California Conservation Easements Registry, and from local land trusts indicates that none of the alternatives would affect lands protected under agricultural conservation easements. There is no effect under NEPA and no impact under CEQA associated with the potential for additional agricultural land conversion on lands protected by an agricultural conservation easement. Moreover, because the analysis is on conversion of land classified as Important Farmlands based on its physical characteristics, the level of agricultural land conversion discussed above would not change even if it is determined that some land potentially affected is under an agricultural conservation easement.

BNSF Alternative. Table 3.14-10 lists by county the acreage of Williamson Act and FSZ contract lands affected by the BNSF Alternative. The BNSF Alternative would affect a total of 2,105 acres of farmland under Williamson Act contract and 358 acres of farmland under FSZ contract, which are not currently in nonrenewal, with the largest affected acreage in Kings County. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to these parcels directly affected by the alignment, a total of 283 acres over 29 parcels of contracted Williamson Act Land and 14 acres over 5 parcels of contracted FSZ land may be forced into nonrenewal if the project footprint reduces the size of the parcels to below the minimum allowable acres prescribed by the counties for Williamson Act contracts and therefore potentially causing Important Farmlands to convert to nonagricultural use. Table 3.14-11 shows the acreage for lands that could be subject to contract nonrenewal due to the project footprint reducing the size of the parcels to below the minimum allowable acres prescribed by the Williamson Act. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts and therefore potential conversion of Important Farmlands to nonagricultural uses is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Table 3.14-10
Protected Farmland Permanently Affected by the BNSF Alternative (acres)

Protected Farmland Classification*	Fresno County	Kings County	Tulare County	Kern County
Prime Williamson Act Land	398	593	428	603
Non-Prime Williamson Act Land	0	1	72	0
Farmland Security Zone	0	289	51	18
Prime Williamson Act Land–Nonrenewal	0	9	0	203
Non-Prime Williamson Act Land–Nonrenewal	0	2	0	0
Farmland Security Zone–Nonrenewal	0	24	0	0
Total	**398**	**928**	**551**	**824**
* Prime Farmland under Williamson Act Contract is allowed to be on a smaller parcel (10 acres) than non-prime farmland (40 acres).				

Table 3.14-11
Protected Farmland Potentially Forced into Williamson Act and FSZ Nonrenewal (acres)

HST Alternative Alignment	Williamson Act Land Acres	Williamson Act Parcels	FSZ Land Acres	FSZ Parcels
BNSF Alternative	283	29	14	5
Comparison of Other Alternatives to Corresponding Segment of BNSF Alternative				
Hanford West Bypass 1 Alternative	52	3	-14	-4
Hanford West Bypass 1 Modified Alternative	99	10	-14	-4
Hanford West Bypass 2	94	2	-5	-2
Hanford West Bypass 2 Modified Alternative	96	10	-5	-2
Corcoran Elevated Alternative	-30	-3	0	0
Corcoran Bypass Alternative	-35	-3	0	0

Table 3.14-11
Protected Farmland Potentially Forced into Williamson Act and FSZ Nonrenewal (acres)

HST Alternative Alignment	Williamson Act Land Acres	Williamson Act Parcels	FSZ Land Acres	FSZ Parcels
Allensworth Bypass Alternative	85	8	0	0
Wasco–Shafter Bypass Alternative	4	0	0	0
Bakersfield South Alternative	0	0	0	0
Bakersfield Hybrid Alternative	0	0	0	0

FSZ = Farmland Security Zone
HST = high-speed train

Hanford West Bypass 1 Alternative. The Hanford West Bypass 1 Alternative would affect 579 acres of Williamson Act Land and 56 acres under FSZ contract. The total number of acres affected by the Hanford West Bypass 1 Alternative is less than the 775 acres of Williamson Act and 288 acres of FSZ lands affected by the comparative portion of the BNSF Alternative, and this results in 196 fewer acres of Williamson Act and 232 fewer acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to the above totals, 87 acres of Williamson Act Land and 0 acres of FSZ land may be subject to nonrenewal because of the reduced parcel size and this represents 52 more acres of Williamson Act Land and 14 less acre of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Hanford West Bypass 1 Modified Alternative. The Hanford West Bypass 1 Modified Alternative would affect 656 acres of Williamson Act Land and 63 acres under FSZ contract. The total number of acres affected by the Hanford West Bypass 1 Modified Alternative is less than the 775 acres of Williamson Act and 288 acres of FSZ lands affected by the comparative portion of the BNSF Alternative, and this results in 119 fewer acres of Williamson Act and 225 fewer acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to the above totals, 134 acres of Williamson Act Land and 0 acres of FSZ land may be subject to nonrenewal because of the reduced parcel size, which is 99 more acres of Williamson Act Land and 14 less acre of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Hanford West Bypass 2 Alternative. The Hanford West Bypass 2 Alternative would affect 522 acres of Williamson Act Land and 107 acres under FSZ contract. The total number of acres affected by the Hanford West Bypass 2 Alternative is less than the 775 acres of Williamson Act

and 288 acres of FSZ lands affected by the comparative portion of the BNSF Alternative, which results in 253 fewer acres of Williamson Act and 181 fewer acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to the above totals, 129 acres of Williamson Act Land and 9 acres of FSZ land may be subject to nonrenewal because of reduced parcel size, which is 94 more acres of Williamson Act Land and 5 less acres of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Hanford West Bypass 2 Modified Alternative. The Hanford West Bypass 2 Modified Alternative would affect 628 acres of Williamson Act Land and 115 acres under FSZ contract. The total number of acres affected by the Hanford West Bypass 2 Modified Alternative is less than the 775 acres of Williamson Act and 288 acres of FSZ lands affected by the comparative portion of the BNSF Alternative, and this results in 147 fewer acres of Williamson Act and 173 fewer acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to the above totals, 131 acres of Williamson Act Land and 6 acres of FSZ land may be subject to nonrenewal because of reduced parcel size, which is 96 more acres of Williamson Act Land and 5 less acres of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Corcoran Elevated Alternative. The Corcoran Elevated Alternative passes through the city of Corcoran and impacts 180 acres of Williamson Act contract and 16 acres of land under FSZ contract. The total number of acres affected by the Corcoran Elevated Alternative is less than the 314 acres of Williamson Act and more than the 1 acre of FSZ lands affected by the comparative portion of the BNSF Alternative, and this results in 134 fewer acres of Williamson Act and 15 more acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition to the above totals, 14 acres of Williamson Act Land may be subject to nonrenewal because of reduced parcel size, which is 30 fewer acres of Williamson Act Land and the same acreage of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Corcoran Bypass Alternative. The Corcoran Bypass Alternative would affect 200 acres of land under Williamson Act contract and 57 acres of land under FSZ contract. The total number of acres affected by the Corcoran Bypass Alternative is less than the 314 acres of Williamson Act and more than the 1 acre of FSZ lands affected by the comparative portion of the BNSF Alternative, which results in 114 fewer acres of Williamson Act and 56 more acres of FSZ acres affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition, a total of 9 acres of Williamson Act contracted land may be subject to nonrenewal because of reduced parcel size, which is 35 fewer acres of Williamson Act Land and the same acreage of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands

to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Allensworth Bypass Alternative. The Allensworth Bypass Alternative would affect 410 acres of land under Williamson Act contract and 10 acres under FSZ contract land. These totals affected by the Allensworth Bypass Alternative are less than the 420 acres of Williamson Act and more than the 18 acres of FSZ lands affected by the comparative portion of the BNSF Alternative, which results in 10 fewer acres of Williamson Act and 8 fewer acres of FSZ lands affected. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition, 143 acres of Williamson Act Land may be subject to nonrenewal because of reduced parcel size, which is 85 more acres of Williamson Act Land and the same acreage of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Wasco–Shafter Bypass Alternative. The Wasco–Shafter Bypass Alternative would affect 304 acres of land under Williamson Act contract. This is 13 fewer acres of Williamson Act contract land than the corresponding segment of the BNSF Alternative, which impacts 317 acres of land under Williamson Act contract. The impact of converting these lands to nonagricultural uses is discussed above under Impact AG #4. In addition, 30 acres of Williamson Act Land may be subject to nonrenewal because of reduced parcel size, which is 4 more acres of Williamson Act Land and the same acreage of FSZ land than the comparative portion of the BNSF Alternative. Potential removal of Important Farmlands for Williamson Act and FSZ contract could cause Important Farmlands to convert to nonagricultural use. The effect of the project to cause removal of lands from Williamson Act or FSZ contracts, and therefore potential conversion of Important Farmlands to nonagricultural uses, is considered to have substantial intensity under NEPA and the impact is significant under CEQA.

Bakersfield South Alternative. The Bakersfield South Alternative does not impact any lands under either Williamson Act or FSZ contracts.

Bakersfield Hybrid Alternative. The Bakersfield Hybrid Alternative does not impact any lands under either Williamson Act or FSZ contracts.

Potential Heavy Maintenance Facility Alternatives. None of the land at the Fresno Works–Fresno, Kern COG–Wasco, Kern COG–Shafter, and Shafter West HMF sites is currently under Williamson Act or FSZ contract. A total of 242 acres of land on the Hanford site is under Williamson Act contract, and 228 acres are under FSZ contract.

Impact AG #7 – Effects on Confined Animal Agriculture

This analysis considers whether effects on confined animal agriculture could lead to additional conversion of Important Farmlands. Conversion of lands with dairy operations, poultry farms, or other confined animal facilities (cattle feedlot and hog feedlot) could include loss of structures and facilities, as well as removal of associated land areas for growing forage crops and/or receiving waste (nutrient distribution). Appendix 3.14-B provides more detail about project effects on confined animal agriculture. Conversions of part of a confined animal operation to nonagricultural uses could result in secondary impacts. For example, changes to land areas that receive dairy waste would require modification of the dairy waste management and nutrient management plans, and would result in the need to increase offsite disposal of waste or to reduce the size of the dairy's herd. Obtaining permits for large confined animal operation is often

a slow and expensive process, which makes the conversions of any land used for confined animal agriculture, whether it is for the grazing of the animals or the disposal of their waste, costly and potentially economically harmful to the farmer. These land conversions could impact the economic viability of one or more confined animal operations. A more in-depth discussion of the economic impacts can be found in Section 3.12, Socioeconomics, Communities, and Environmental Justice.

As part of the right-of-way acquisition process, the Authority's right-of-way agents would work with each affected confined animal operator to address issues of concern. Agents would attempt to resolve conflicts, for example by reconfiguring facilities so that there is no net loss of operational capacity. The agents might not be able to resolve all issues, and would offer compensation to landowners that demonstrate a hardship from loss of facilities.

As discussed above, the FMMP impact analysis focused on agricultural land that has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained yields of crops. It does not directly address agricultural operations such as confined animal facilities. Federal and state environmental law regarding farmland such as the Farmland Protection Policy Act of 1981 and the California Land Conservation Act of 1965, focus on the conversion of Important Farmland to nonagricultural uses. Therefore, project effects on confined animal facilities would not result in Important Farmland conversion other than those identified in Impact AG # 4 above. For this reason, impacts from the loss of confined animal facilities would have a negligible intensity under NEPA and a less-than-significant impact under CEQA from the standpoint of Important Farmland conversion. For additional information on the right-of-way process and a discussion of agricultural economic impacts associated with conversion of lands with confined animal facilities, see Section 3.12, Socioeconomics, Communities, and Environmental Justice.

Additionally, where the HST right-of-way would be located within 100 feet of confined animal facilities, the HST operation could cause noise that would disturb livestock. Based on existing research, the FRA has established a threshold for high-speed train noise effects on livestock of 100 dBA SEL (FRA 2005). As discussed in Section 3.4, Noise and Vibration, SEL describes the noise from a single event such as a train passing a given point. At a distance of less than 100 feet, the SEL for project operations on the BNSF Alternative would exceed 100 dBA SEL at one feedlot in Kings County, at three confined animal facility operations in Kings County and at two confined animal facility operations in Tulare County (for more details see Appendix 3.14-B). Remaining facilities at these sites would be located more than 100 feet away from the tracks, and therefore noise levels would not exceed the 100-dBA SEL threshold. The impact of noise at the dairy and feedlot would not preclude agricultural use and would not result in farmland conversion. Therefore, the impact of HST noise effects on confined animals for all alternatives would have no impact on farmland under NEPA, and the impact would be less than significant under CEQA.

A HST operating at 220 mph would generate vibration levels of 75 VdB at up to 70 feet from the tracks (refer to Section 3.4, Noise and Vibration). The sheds at the confined animal facilities and feedlot described above would be within 70 feet of the HST tracks and may be affected by vibration (for more details see Appendix 3.14-B). This impact would not preclude agricultural use and would not result in farmland conversion. Therefore, the impact from project operation vibration effects for all alternatives on confined animal operations would have no effects under NEPA and the impact would be less than significant under CEQA.

BNSF Alternative Alignment. The project would result in the conversion of about 439 acres of land on 65 parcels that are used for confined animal agriculture. Structures or other facilities would be displaced in nine of those operations (one in Fresno County, six in Kings County, and two in Tulare County) including up to nine structures or sheds, one cattle pen, six retention

basins, and two residences. Also four sheds in two of the facilities could be affected by noise and vibration. Of the total land to be acquired, about 344 acres, or 78%, would be in areas designated for nutrient distribution or waste disposal. The remaining 95 acres (22%) would be in areas associated with existing facilities or under improvement. Of the 65 parcels affected, land acquisition would amount to 1 acre, or less, in 27 parcels, between 1 acre and 10 acres in 24 parcels, and between 10 acres and 85 acres in 14 parcels. For more details see Appendix 3.14-B.

Hanford West Bypass 1 Alternative. A total of 147 acres of land associated with dairies would be affected by the Hanford West Bypass 1 Alternative. Four dairies would be affected by the alignment. Of the total land acquired, about 125 acres, or 85%, would be in areas designated for nutrient distribution or waste disposal. The remaining 22 acres (15%) would be in areas associated with existing facilities or under improvement.

Hanford West Bypass 1 Modified Alternative. A total of 154 acres of land associated with dairies would be affected by the Hanford West Bypass 1 Modified Alternative. Four dairies would be affected by the alignment. Of the total land acquired, about 122 acres, or 79%, would be in areas designated for nutrient distribution or waste disposal. The remaining 32 acres (21%) would be in areas associated with existing facilities or under improvement.

Hanford West Bypass 2 Alternative. A total of 128 acres of land associated with dairies would be affected by the Hanford West Bypass 2 Alternative. Four dairies would be affected by the alignment; most of the land that would be affected is used for nutrient distribution or waste disposal. Of the total land acquired, about 125 acres, or 85%, would be in areas designated for nutrient distribution or waste disposal. The remaining 22 acres (15%) would be in areas associated with existing facilities or under improvement.

Hanford West Bypass 2 Modified Alternative. A total of 130 acres of land associated with dairies would be affected by the Hanford West Bypass 2 Modified Alternative. Three dairies would be affected by the alignment. Of the total land acquired, about 125 acres, or 96%, would be in areas designated for nutrient distribution or waste disposal. The remaining 5 acres (4%) would be in areas associated with existing facilities or under improvement.

Corcoran Elevated Alternative. The Corcoran Elevated Alternative passes through the city of Corcoran adjacent to the BNSF Alternative and would have the same impact on confined animal facilities as the BNSF Alternative.

Corcoran Bypass Alternative. The Corcoran Bypass Alternative would have the same impacts on confined animal facilities in Tulare County as the BNSF Alternative. In Kings County, it would separate operational facilities from land used for crops and nutrient distribution at one less dairy than the BNSF Alternative.

Allensworth Bypass Alternative. The Allensworth Bypass Alternative would not affect confined animal facilities.

Wasco–Shafter Bypass Alternative. The Wasco–Shafter Bypass Alternative would not affect confined animal facilities.

Bakersfield South Alternative. The Bakersfield South Alternative would not affect confined animal facilities.

Bakersfield Hybrid Alternative. The Bakersfield Hybrid Alternative would not affect confined animal facilities.

Impact AG #8 – Effects on Irrigation Distribution Canals

This analysis considers whether effects on irrigation distribution canals could lead to additional conversion of Important Farmlands. Irrigation districts have raised concerns that the HST could cause increased response time to emergencies such as a canal blowout. The project would close very few public roads (see Appendix 2-A). Those roads that are closed would typically result in 1 mile, or less, of out-of-direct travel. Where the HST parallels the BNSF, response times to such incidents would typically be improved because road overcrossings along the HST would also cross over the existing BNSF Railway, resulting in fewer at-grade railroad crossings that cause delays when freight trains are traveling through the area. Where the HST is not adjacent to the BNSF Railway, some private farm roads that may currently serve as access to distribution lines would be closed at the HST right-of-way. This could increase the response time to some canal sections. However, road crossings of the HST in rural areas would occur approximately every 2 miles; therefore, the amount of out-of-direction travel would at most be approximately 6 miles (based off of blocks being 1 square mile). These 6 miles of travel at an average speed of 45 mph would equal an approximately 8-minute increase in travel time. Effects to response times for canal maintenance are not expected to result in conversion of Important Farmland, are considered to have no effect under NEPA, and the impact would be less than significant under CEQA.

Impact AG #9 – Noise Effects to Grazing Animals

This analysis considers whether noise effects on grazing animals could lead to additional conversion of Important Farmlands. HST operation would result in noise levels of over 100 dBA SEL when trains run through Grazing Lands. The screening distance (i.e., distance from trackway centerline within which an impact could result) for a single-train pass-by SEL of 100 dBA would be approximately 100 feet from the track centerline (see Chapter 3.4 Noise and Vibration, subsection 3.4.5.3. Noise disturbance to Grazing Lands would vary by alternative with the BNSF Alternative impacting 66.3 acres, the Hanford West Bypass 1 Alternative impacting 23.1 more acres than the corresponding portion of the BNSF, the Hanford West Bypass 2 Alternative impacting 18.1 more acres than the corresponding portion of the BNSF, the Corcoran Elevated Alternative impacting 39.9 more acres than the corresponding portion of the BNSF, the Corcoran Bypass Alternative impacting 40.6 more acres than the corresponding portion of the BNSF, the Allensworth Bypass would affect 6.1 fewer acres than the corresponding portion of the BNSF Alternative, and both the Bakersfield South and Bakersfield Hybrid alternatives would affect 7.4 fewer acres than the corresponding portion of the BNSF Alternative.

The impact would not convert either Important Farmland or Grazing lands to nonagricultural use; rather, it may result in increased stress to grazing cattle that remain within the affected area. Cattle could move from the affected area, which would eliminate the noise-related stress but also would reduce the usable grazing area. Analysis on impacts to grazing cattle from noise found that certain noise, such as the sound of a truck horn, was shown to increase the heart rates of free-ranging cattle, while cattle habituated to the sounds and sights of cars and trucks will readily graze along highways and seldom react. Noises greater than threshold have provoked retreat, freezing, or strong startle response (Manci et al. 1988). Losses in farm productivity from these effects may be considered an economic impact to be addressed during the right-of-way acquisition process. Because the impact from noise disturbance would not preclude agricultural use and would not result in Important Farmland conversion for all alternatives, there would be no impact under NEPA or CEQA.

Impact AG #10 – Wind-Induced Effects

This analysis considers whether wind-induced effects from the HST could lead to additional conversion of Important Farmlands. During operation, HSTs induce airflow (i.e., generate wind) along the sides and at the end of the train (known as *wake*). Studies summarized by the FRA in

1999 found that the strength of the airflow depends on the distance from the train, the train's geometry (i.e., the shape of the nose and end of the train), and the train's operating speed. FRA found that the airflow dissipates in less than 1 second (FRA 1999). Another study found that wind generated by the train has a velocity of approximately 10% of the train velocity at a distance of 3 meters (approximately 10 feet) from the train (Neppert and Sanderson 1977; Sterling and Baker, 2010, personal communication). Therefore, an extrapolation of these studies for an HST traveling at 220 mph indicates that it would generate a wind gust lasting less than 1 second at a distance of approximately 10 feet from the train tracks. The guideway would be a minimum of 21 feet from the edge of the right-of-way (refer to Section 2.1.4, Infrastructure Components), and in many cases the guideway would be farther away (approximately 30 feet), particularly in agricultural areas. In these areas, induced airflow is calculated to be 2.43 mph at the edge of the HST right of way (Appendix 3.3-A). Because of typical equipment-turning areas, orchards or fields would have an additional buffer from the HST right of way, and therefore wind speeds would be lower where trees or crops are present. Therefore, the HST would not cause adverse wind effects on adjacent farmland (Authority 2012d) and indirect effects (e.g., interference with insect pollination, additional pesticide drift, or application restrictions) (Authority 2012e) are not expected to result in additional farmland conversions. There would be no effect under NEPA and no impact under CEQA.

Research on honey bees found that they forage when temperatures are 55°F and higher, and they do not forage in rain or in wind stronger than 12 mph (Authority 2012f). The winds generated by the HST would be less than those that would prevent the honey bees from foraging at the edge of the HST right-of-way. Therefore, the HST would not cause wind effects to adjacent farmlands, and indirect effects (e.g., interference with insect pollination, additional pesticide drift and application restrictions) are not expected to result in additional farmland conversion. There would be no effect under NEPA and no impact under CEQA.

Impact AG #11 – Effects on Aerial Spraying

This analysis considers whether any potential effects on aerial spraying could lead to additional conversion of Important Farmlands. The height of vertical HST structures, such as poles, radio communication towers, and elevated guideways, could interfere with aerial spraying of agricultural lands adjacent to the alignment. Currently, no restrictions exist on the distances an aircraft must maintain from utility lines or towers (Gage 2010). Agricultural aircraft currently fly in areas where utility lines of varying heights, such as telephone poles and electrical transmission towers, exist in or near the sprayed fields. The distance that aircraft maintain from power lines and poles depends on the cropping pattern, the field's orientation, and operator-determined safety factors. Many of the vertical HST structures are similar to existing utility structures placed in and near agricultural fields. The HST structures of the greatest concern for aerial spraying are the 100-foot tall radio communication towers that would be placed approximately every 3 miles along the alignment. These structures would be taller than many of the structures currently located in the rural areas along the alternative alignments. Construction of these towers would follow federal, state, and local safety guidelines for radio masts, including lighting, and thus ensuring that they are properly visible to aircraft conducting aerial spraying. Therefore, changes in spraying patterns are not anticipated to cause conversion of Important Farmland to a nonagricultural use. There would be no effect under NEPA and no impact under CEQA.

3.14.6 Project Design Features

The following design features are considered a part of the HST project.

Restoration of Land Used for Temporary Staging Areas. All staging areas on Important Farmlands will be returned to as close to their pre-construction staging condition as possible with

the goal of ensuring these parcels remain available for long-term agricultural use. This requirement is included in the design/build construction contract requirements.

Farmland Consolidation Program. The Authority has established and will administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, on request, the program will assist the owners of remnant parcels in selling those remnants to adjacent landowners. The goal of the program is to provide for continued agricultural use on the maximum feasible amount of remnant parcels that otherwise may be uneconomical to farm. The program will focus on severed remainder parcels, including those that were under Williamson Act or Farmland Security Zone contract at the time of right-of-way acquisition and have become too small to remain in the local Williamson Act or Farmland Security Act program. The program will assist landowners in obtaining lot line adjustments where appropriate to incorporate remnant parcels into a larger parcel that is consistent with size requirements under the local government general plan. The program will operate for no less than 5 years after construction of the Fresno to Bakersfield Section is completed.

The Authority and FRA expect that productive farmland would be farmed in some manner, and not left idle in perpetuity. However, the Authority and FRA recognize that constructing the Fresno to Bakersfield HST Project will have a disruptive effect on farm ownership that would temporarily idle some remainder parcels. The intent of the Farmland Consolidation Program is to take responsibility for the disruptive effects and proactively work to restore remainder parcels to productive agricultural use (and not rely on market forces to accomplish the same result). This process would be a series of real estate transactions, and the Authority would be using the same real property transaction processes used by Caltrans; this process features the use of Authority right-of-way agents who generally follow Caltrans procedures. The State of California has a long history of managing real estate transactions through Caltrans and other state entities (e.g., the Department of General Services), which helps promote the success of the Authority's farmland consolidation program.

Permit Assistance. The Authority will assign a representative to act as a single point of contact to assist each confined animal facility owner during the process of obtaining new or amended permits or other regulatory compliance necessary to the continued operation or relocation of the facility. The Authority will consider and may provide compensation when acquisition of a confined animal site would either require relocation of the facility or amendment of its existing regulatory permits. The Authority has proposed to create a permit assistance center for landowners and operators whose permits are impacted by the HST. This permit center will focus on helping the permit holders modify or obtain any new permits that are required as a result of the HST impacts.

Research. During the HST testing phase, the Authority will fund a program to undertake original research on the wind and noise effects of HST operations on agricultural activities. The Authority will engage qualified researchers within the University of California or California State University system to undertake this research. The researcher will be selected by the Authority through a request for proposal process. The research will include monitoring of noise and wind effects at representative points along the test track. The research period will include the testing phase and extend 2 years after commencement of revenue service. The Authority will publicly distribute a report of the findings of the research program.

The research will include, but is not limited to, the following subjects:

- Generated wind speed, duration, and area of influence from HST trainsets at typical operational speeds.
- Effects of HST-generated wind on the effectiveness of honey bee pollination.

- Dust production as a result of typical HST operations, including entrainment and dispersal patterns of dust in the HST slipstream.
- Generated noise levels and duration from HST trainsets at typical operational speeds.
- Noise contours depicting modeled noise levels at distance from the tracks.
- Practical methods for reducing effects on agriculture.

3.14.7 Mitigation Measure

The following mitigation measure is based on the Statewide Program EIR/EIS mitigation strategies. The Authority would implement this measure to reduce substantial adverse environmental impacts resulting from the project.

Ag-MM #1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. The Authority has entered into an agreement with the DOC California Farmland Conservancy Program to implement agricultural land mitigation for the High-Speed Train Project. The Authority will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to fund the purchase of agricultural conservation easements from willing sellers in the Fresno to Bakersfield Section. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio of not less than 1:1 for lands that are permanently converted to nonagricultural use by the project. In addition, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 ratio minimum, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in *County of Madera, et al. v. California High-Speed Rail Authority*. This approach will provide a consistent approach to calculating the total amount of acres of agricultural conservation easements across the Central Valley.

The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators.

This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program (DOC 2010a). However, because the mitigation does not anticipate the creation of new farmland (e.g., conversion of natural lands to agriculture), the mitigation measure would not reduce impacts to a less-than-significant level.

Impacts of Mitigation: The above mitigation would place lands that are currently not under any type of farmland conservation easement into a new easement that would permanently protect the farmland from future conversion to nonagricultural uses. As no farmland is being converted as a result of the mitigation, there are no adverse agricultural land impacts attributable to the easements. The mitigation measure would instead create a beneficial impact by preserving agricultural land in perpetuity for agricultural use. The agricultural land conversion easements will maintain current use; therefore no other adverse secondary impacts are anticipated.

3.14.8 NEPA Impact Summary

NEPA impacts are assessed based on the intensity and context of the impact. The NEPA intensity definitions for agricultural land are provided in Section 3.14.3.1. The context for assessment of HST impacts on agricultural land is regional within the San Joaquin Valley, with consideration of the finite acreage of Important Farmland in California.

The No Project Alternative would have an impact of substantial intensity in the regional context of Important Farmland in the San Joaquin Valley to accommodate projected future growth in Fresno, Kings, Tulare, and Kern counties. Because the agricultural lands in the San Joaquin Valley are of the highest quality and are the most productive farmland in the United States, based on crop value, the incremental encroachment from the No Project Alternative results in a significant impact under NEPA.

Impacts from the nine project alternatives, seven station alternatives, and the five HMF alternatives would be as follows:

- Temporary use of Important Farmland during construction would be of a negligible intensity at the regional scale because the land would not be permanently converted to a nonagricultural use. Because the lands would be returned to agricultural production, a temporary loss in production would not be significant under NEPA.

- Temporary utility service and irrigation infrastructure impacts would be of negligible intensity in the regional context of the San Joaquin Valley because these impacts would not result in a permanent conversion of farmland to a nonagricultural use. Therefore, these temporary impacts would not be significant under NEPA.

- The noise and vibration effects of construction on livestock would not lead to permanent conversion of farmland to nonagricultural use and would have no impact on livestock because the project would generate noise levels below the 85 dBA threshold and vibration levels below 75 VdB at 100 feet. These impacts therefore would not affect current milk production, and therefore would have no impact under NEPA. Construction noise and vibration would not be considered a significant impact under NEPA.

- All of the HST alternatives except for the Bakersfield South and Hybrid alternatives would have effects of substantial intensity on Important Farmland, as shown in Table 3.14-5. NRCS Land Evaluation and Site Assessment scores are greater than 160 for Fresno County. The project would disrupt the agricultural setting by constructing a large linear feature, typically at least 100 feet wide and at-grade. Farmland losses would be of substantial intensity and, in the context of the regional agricultural setting where the permanent loss of any agricultural land is significant, significant under NEPA.

- Each of the HST alternatives would have effects of negligible intensity from severing large farm parcels because it is not expected that the severance of large parcels would create noneconomic remnants. Therefore, it would not result in a permanent conversion of farmland to a nonagricultural use. This would not be a significant effect under NEPA.

- All of the HST alternatives except for the Bakersfield South and Bakersfield Hybrid alternatives would affect lands that are subject to Williamson Act or FSZ contracts. The impact on farmland conversion would be of substantial intensity in the context of these contracts in the region. However, the loss of contracts on these lands may result in effects of moderate intensity with the administration of the Farmland Consolidation Program. With the programs' focus on continued agricultural use of the maximum feasible amount of farmland, the project effect on Williamson and FSZ contracts would not be significant under NEPA.

- Some of the HST alternatives would result in site-specific impacts on individual confined animal facilities with the possible acquisition of property, and resulting closure of some confined animal facilities. However, properties no longer used for confined animal agriculture could be used for another type of agricultural activity. Therefore, the loss of confined animal agricultural facilities would be an impact be of negligible regional impact on agriculture in the San Joaquin Valley, and would not be a significant under NEPA.

- HST operations would result in no noise effects and no vibration effects on confined animal operations, so would not lead to the conversion of land from agricultural to nonagricultural use. Therefore, HST operations would have no impact on confined animal facilities under NEPA.

- The HST-generated wind effects would not render agricultural land unusable for farming under any of the HST alternatives. Therefore, these effects are of negligible intensity at the local scale, and would not be significant under NEPA. Similarly, the HST elevated structures would not interfere with aerial application of pesticides and would not render agricultural lands unusable for farming, and would have no effect under NEPA. However, indirect effects (e.g., noise, induced winds) on livestock may contribute to local economic impacts (see Section 3.12, Socioeconomics, Communities, and Environmental Justice).

3.14.9 CEQA Significance Conclusions

Table 3.14-12 summarizes significant project impacts, associated mitigation measures, and levels of significance after mitigation. Agricultural land conversion easements are widely used by public agencies and are an effective measure for mitigating the impacts of agricultural land conversion.

Table 3.14-12
Summary of Significant Agricultural Lands Impacts and Mitigation Measures

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Project			
AG#4: Permanent Conversion of Agricultural Land to Nonagricultural Use. The BNSF Alternative would affect 3,541 acres of Important Farmland. The effect of other alignment alternatives on Important Farmland and the magnitude of that effect relative to the corresponding segment of the BNSF Alternative are as follows: Hanford West Bypass 1 Alternative – 370 fewer acres than the BNSF Alternative Hanford West Bypass 1 Modified Alternative – 243 fewer acres than the BNSF Alternative Hanford West Bypass 2 Alternative – 357 fewer acres than the BNSF Alternative Hanford West Bypass 2 Modified Alternative – 178 fewer acres than the BNSF Alternative Corcoran Elevated Alternative – 128 fewer acres than the BNSF Alternative Corcoran Bypass Alternative – 35 fewer acres than the BNSF Alternative Allensworth Bypass Alternative – 32 fewer acres than the BNSF Alternative. Wasco–Shafter Bypass Alternative – 105 fewer acres than the BNSF Alternative Bakersfield South Alternative would have the same impacts as the BNSF Alternative Bakersfield Hybrid Alternative would have the same impacts as the BNSF Alternative	Significant	**AG-MM #1:** Preserve the total amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland	Significant

Table 3.14-12
Summary of Significant Agricultural Lands Impacts and Mitigation Measures

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
AG#6: Effects on Land under Williamson Act or FSZ Contracts, Local Zoning, or Conservation Easement Lands. The BNSF Alternative could potentially affect up to 2,105 acres of Important Farmland under Williamson Act and 358 acres of Important Farmland under FSZ contract. The effect of other alignment alternatives on Important Farmland and the magnitude of that effect relative to the corresponding segment of the BNSF Alternative are as follows: Hanford West Bypass 1 Alternative – 196 fewer acres than the BNSF Alternative Hanford West Bypass 1 Modified Alternative – 119 fewer acres than the BNSF Alternative Hanford West Bypass 2 Alternative – 253 fewer acres than the BNSF Alternative Hanford West Bypass 2 Modified Alternative – 147 fewer acres than the BNSF Alternative Corcoran Elevated Alternative – 134 fewer acres than the BNSF Alternative Corcoran Bypass Alternative – 114 fewer acres than the BNSF Alternative. Allensworth Bypass Alternative – 10 fewer acres than the BNSF Alternative. Wasco–Shafter Bypass Alternative – 13 fewer acres than the BNSF Alternative Bakersfield South Alternative would have the same impacts as the BNSF Alternative Bakersfield Hybrid Alternative would have the same impacts as the BNSF Alternative	Significant	**AG-MM #1:** Preserve the total amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland	Less than Significant