

3.6 Public Utilities and Energy

This section describes the regulatory setting, affected environment, potential impacts, and mitigation measures for public utilities and energy in the area potentially affected by the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) to the Fresno to Bakersfield Section of the California High-Speed Rail (HSR) system.

This Draft Supplemental EIR/EIS compares the F-B LGA to the complementary portion of the Preferred Alternative that was identified in the *Fresno to Bakersfield Section California High-Speed Train Final Environmental Impact Report/Environmental Impact Statement* (EIR/EIS) (Authority and FRA 2014). As discussed in Section 1.1.3 of this Draft Supplemental EIR/EIS, the complementary portion of the Preferred Alternative consists of the portion of the BNSF Railway Alternative from Poplar Avenue to Hageman Road and the Bakersfield Hybrid from Hageman Road to Oswell Street (further referenced as the “May 2014 Project” in this Draft Supplemental EIR/EIS). Since the Fresno to Bakersfield Section Final EIR/EIS does not evaluate the May 2014 Project as a discrete subsection of the Fresno to Bakersfield Project (as it did for the Allensworth Bypass, for example), affected environment and impact summary discussion included in this section for the May 2014 Project has been extrapolated from the available information contained in the *Fresno to Bakersfield Section Final EIR/EIS*.

3.6.1 Regulatory Setting

This section identifies the federal, state, regional, and local regulations, laws, and orders that apply to public utilities and energy. The project would comply with all applicable regulations.

3.6.1.1 Federal

Please see Section 3.6.2.1 (pages 3.6-1 and 3.6-2) of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) for a detailed discussion of applicable federal regulations. Agencies responsible for implementing federal laws and regulations include but are not limited to the Federal Energy Regulatory Commission (FERC); the National Highway Traffic Safety Administration, which regulates Corporate Average Fuel Economy standards; and the U.S. Environmental Protection Agency (USEPA), which measures vehicle fuel efficiency. Applicable federal laws and regulations relevant to public utilities and energy include the following:

- Power Plant and Industrial Fuel Use Act (Executive Order 12185, 44 C.F.R. Section 75093; Public Law 95-620), Section 403(b)
- Norman Y. Mineta and Special Programs Improvement Act (Public Law 108-426)
- Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.)

No new federal regulations for public utilities and energy have been adopted since release of the Fresno to Bakersfield Section Final EIR/EIS.

3.6.1.2 State

Please see Section 3.6.2.1 (pages 3.6-2 through 3.6-4) of Chapter 3.6, Public Utilities and Energy, of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) for a detailed discussion of applicable state regulations. Applicable state laws and regulations relevant to public utilities and energy include the following:

- Public Utilities Code Section 1001–1013 (California Public Utilities Commission [CPUC] General Order 131-D)
- California Code of Regulations, Title 24, Part 6, Energy Efficiency Standards
- Renewable Portfolio Standard Program (Senate Bill 1078)
- Integrated Waste Management Act (Assembly Bill 939)
- Local Government Construction and Demolition (C&D) Guide (Senate Bill 1374)

- Protection of Underground Infrastructure [California Government Code, Section 4216]
- Pavley Rule (Assembly Bill 1493)
- CPUC General Order No. 95
- Water Conservation Act of 2009 (Senate Bill X7-7)
- Rules for Overhead 25-kilovolt (kV) alternating current (AC) Railroad Electrification Systems

In addition, since release of the Fresno to Bakersfield Section Final EIR/EIS, the CPUC adopted General Order 176, *Safety Rules and Regulations Governing 25 kV AC Railroad Electrification for the Operation of High Speed Trains*, on March 26, 2015. General Order 176 establishes uniform safety requirements governing the design, construction, operation, and maintenance electrical wires constructed under the HSR project alignment and facilities. Activities associated with the proposed project would be consistent with rules and regulations established by the CPUC in order to protect workers and the public from potential safety hazards.

3.6.1.3 Regional and Local

Please see Section 3.6.2.3 (page 3.6-4) of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) for a detailed discussion of regional and local regulations. Applicable regional and local laws and regulations relevant to public utilities and energy include the following:

Kern County:

- Kern County General Plan: Land Use, Open Space, and Conservation Element
 - Public Facilities and Services Goals 1 through 13, Policies 1 through 17, Implementation Measures A through II
 - General Provisions Goal 1, Policies 9 through 17, Implementation Measures D and E
- Kern County Municipal Code, Title 14, Utilities
- Kern County Planning Department, “Energy Element,” in Kern County General Plan, 214–215
- Kern County and Incorporated Cities Integrated Waste Management Plan

City of Shafter:

- City of Shafter General Plan, Public Services and Facilities Program, Water Facilities Policies 1 through 6, Sewer Facilities Policies 1 through 8, Solid Waste Policies 1 through 5, Drainage and Flooding Policies 1 through 4, Public Services and Facilities Policies 1 through 6
Shafter Code of Ordinances, Title 13, Public Services

City of Bakersfield:

- Metropolitan Bakersfield General Plan, “Public Services and Facilities Element,” General Utility Services Goals 1 through 4, Policies 1 through 6; Water Distribution Goal 1, Policies 1 through 3; Sewer Service Goals 1 through 3, Policies 1 through 3; Storm Drainage Goals 1 and 2, Policies 1 through 3; Solid Waste Goals 1 and 2, Policies 1 and 2
- Bakersfield Municipal Code, Title 14, Water and Sewers

Those regional and local regulations described for the Shafter, Bakersfield, and Kern County are also applicable to the F-B LGA. As with the May 2014 Project, the F-B LGA would be compatible with applicable local plans and policies.

3.6.2 Methods of Evaluation of Impacts

3.6.2.1 Public Utilities and Energy Data Collection and Analysis

Utilities

Data provided by local utilities service providers in the study area describe the type, size, and location of existing and proposed utility infrastructure. Field survey information gathered in 2009 and 2010 augments the information provided by utility service providers, which was also the methodology used in support of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014). The impact evaluation considers all utilities but focuses on major utilities. This analysis considers high-voltage (HV), underground, and aboveground electrical lines; underground high-pressure natural gas lines; and petroleum lines and facilities “high-risk” utilities, as discussed in the *Fresno to Bakersfield Section Final EIR/EIS* (Authority and FRA 2014: page 3.6-11). In addition, this analysis considers electrical substations to be high-risk. The remaining utilities, such as water and wastewater lines, have a lower safety risk.

Estimates for water demand, wastewater, stormwater, and waste removal services for HSR stations are based on typical rates, such as gallons per minute, acre-feet per acre per year, or ridership and employment projections. The analysis compares these estimated quantities with anticipated supply and capacity, as reported by the service providers in the Fresno to Bakersfield Section of the HSR corridor.

Water demand estimates are presented in Appendix 3.6-B, *Technical Memorandum: Water Usage Analysis for CHSR Fresno to Bakersfield Section*. Water demand estimates for construction are based on an estimated five-year time period in which earthmoving and construction activities requiring water use would occur. Annual operational water use estimates are based on full buildout of the HSR system in 2035. Estimates of existing water use were generated by applying region-specific water use rates for the known land uses in the project footprint (see Section 3.13, Station Planning, Land Use, and Development). Wastewater generation would be approximately 50 percent of total water demand during operation. For additional detail regarding water supply, stormwater, and hydrology, see Section 3.8, Hydrology and Water Resources.

The quantity of waste generated by HSR C&D activities is based on estimates made by project engineers using the existing character of the study area and the requirements of various project attributes. Operational waste generation is based on the anticipated ridership and number of employees, taking into account the estimates of waste generation and recycling in California.

Energy

The proposed HSR system would obtain electricity from the statewide grid. Any potential impacts on electrical production that may result from the proposed HSR system would affect statewide electricity reserves and, to a lesser degree, transmission capacity. To identify the projected energy demand of the Fresno to Bakersfield Section of the HSR system, the estimated energy impact for the entire HSR system was prorated based on the proportion of the length of HSR guideway in the Fresno to Bakersfield Section study area, as shown in Table 3.6-2, Construction Energy Consumption Assumptions for the Fresno to Bakersfield Section of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.6-14).

Energy is commonly measured in terms of British thermal units (Btu). A Btu is defined as the amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit. For transportation projects, energy usage is predominantly influenced by the amount of fuel used. The average Btu content of fuels is the heat value (or energy content) per quantity of fuel as determined from tests of fuel samples. As described in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.6-12), 1 gallon of gasoline produces approximately 114,000 Btu. However, the Btu value of gasoline varies from season to season and from batch to batch. The Btu is the unit of measure used to quantify the overall energy effects expected to result from construction and operation of the HSR.

Transportation energy is generally discussed in terms of direct and indirect energy. Direct energy involves all energy consumed by vehicle propulsion (e.g., automobiles and airplanes). This energy is a function of traffic characteristics such as volume, speed, distance traveled, vehicle mix, and thermal value of the fuel being used. This energy also includes the electrical power requirements of the HSR project, including recoverable energy during HSR train braking, as well as aircraft fuel.

Indirect energy consumption involves the nonrecoverable, one-time energy expenditure involved in constructing the physical infrastructure associated with the project, typically through the irreversible burning of hydrocarbons for operating equipment and vehicles in which energy is lost to the environment.

Energy impacts caused by the project might include the additional consumption of electricity required to power the HSRs (direct use) and consumption of resources to construct the proposed HSR facilities (indirect use). Energy used for vehicle propulsion is a function of traffic characteristics and the thermal value of the fuel used. Petroleum consumption rates for vehicle travel were derived from the travel demand forecast for the HSR and growth projections performed by the California Energy Commission (CEC). These consumption rates were used to determine the amount of petroleum used for transportation under the No Project Alternative (where no HSR system would be constructed and transportation conditions would continue as present) and HSR Build Alternatives (including the Fresno-Bakersfield Section, where the HSR system would be utilized as an alternative to existing transportation options). Current electricity consumption rates from the CEC are compared with the projected energy consumption of the HSR system.

The entire HSR system will be approximately 800 miles long. The length of the Fresno to Bakersfield Section alignment alternatives is approximately 114 miles or less, depending on the design options selected. This is approximately 14 percent of the length of the entire HSR system. Indirect energy consumption involves the nonrecoverable, one-time energy expenditure required to construct the physical infrastructure associated with the project. Indirect energy impacts are evaluated quantitatively. This analysis uses construction energy data from other sources or existing HSR systems. Construction energy information for comparable HSR systems is not readily available. Therefore, construction energy consumption factors identified for the proposed HSR system are derived from data gathered for typical heavy-rail systems and the San Francisco Bay Area Rapid Transit District (BART) heavy-rail commuter system. These data were used to estimate the projected construction energy consumption for the HSR alternatives in the Fresno to Bakersfield Section.

The construction energy payback period is the number of years required to pay back the energy used in construction, with operational energy consumption savings of the HSR alternative prorated to statewide energy savings. The payback period is calculated for the Fresno to Bakersfield Section by dividing the estimated HSR system construction energy by the amount of energy that would later be saved by the full operation of the HSR system (based on the prorated statewide value). The calculations assume that the amount of energy saved in the study year (2035) would remain constant throughout the payback period.

3.6.2.2 *Methods for Evaluating Effects under National Environmental Policy Act*

In the Fresno to Bakersfield Section Final EIR/EIS, analysts applied specified thresholds for each resource topic to assess whether the intensity of each impact is negligible, moderate, or substantial for the Build Alternatives, and provided a conclusion of whether the impact was "significant." Since the Fresno to Bakersfield Section Final EIR/EIS does not evaluate the May 2014 Project as a discrete subsection of the Fresno to Bakersfield Project (as it did for the Allensworth Bypass, for example), it does not provide conclusions using intensity thresholds for the May 2014 Project. Therefore, intensity thresholds are not used for the F-B LGA. Instead, the evaluation of impacts under the National Environmental Policy Act in this Draft Supplemental EIR/EIS focuses on a comprehensive discussion of the project's potential impacts in terms of

context, intensity, and duration and provides agency decision makers and the public with an apples-to-apples comparison between the May 2014 Project and the F-B LGA.

3.6.2.3 CEQA Significance Criteria

Public Utilities

According to California Environmental Quality Act (CEQA) Statute §21068, a “significant effect on the environment” means a substantial, or potentially substantial, adverse change in the environment. For this project, the following criteria are used in determining whether the project would result in a significant impact on public utilities service and systems:

- Construction of new water or wastewater treatment facilities or expansion of existing facilities that could cause significant environmental effects
- New or expanded entitlements to supply water to the project
- A determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the projected project demand in addition to its existing commitments
- Construction of new stormwater drainage facilities or expansion of existing facilities that could cause significant environmental effects
- Insufficient permitted capacity at the landfill serving the project to accommodate solid waste disposal needs
- Noncompliance with federal, state, and local statutes and regulations related to solid waste
- Conflict with a fixed facility such as an electrical substation or wastewater treatment plant

Energy

According to Appendix F of the CEQA Guidelines, EIRs must discuss the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Wise and efficient use of energy may include decreasing overall per-capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. The criteria discussed herein are used to determine whether the HSR system would have a potentially significant effect on energy use, including energy conservation.

Significant long-term operational or direct energy impacts would occur if the HSR system would place a substantial demand on regional energy supply, require significant additional capacity, or significantly increase peak- and base-period electricity demand.

3.6.3 Affected Environment

This section describes the current conditions for public utilities and infrastructure as well as energy demand.

As with the analysis of public utilities and energy provided in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), this analysis of the F-B LGA uses one study area for utilities and one study area for energy generation and transmission.

As described in Section 3.6.3.4 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), the study area for evaluating conflicts with public utilities consists of the construction footprint (area of temporary disturbance during project construction) as well as the project footprint (area of permanent disturbance associated with project features), and includes surface, subsurface, and overhead utilities.

Also as described in Section 3.6.3.4 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), the study area for evaluating impacts of the project on electricity generation and transmission includes the entire state of California (and western states that produce energy that is exported to California), because the HSR system would obtain electricity from the statewide grid.

For this reason, this analysis cannot apportion the use of any particular generation facilities to a particular regional study area. Statewide energy impacts are discussed in Appendices 3.6-A, Existing Plus Project Conditions Energy Analysis, and 3.6-C, Energy Analysis Memorandum, of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014). These appendices are not recreated for the purposes of this Draft Supplemental EIR/EIS because the statewide analysis of electricity generation and transmission is applicable to all sections of the HSR system, including the May 2014 Project and the F-B LGA.

3.6.3.1 Summary of the May 2014 Project Affected Environment

This section provides a summary of the affected environment related to public utilities and energy in the study area of the May 2014 Project using information from the Fresno to Bakersfield Section Final EIR/EIS. The May 2014 Project is the comparable portion of the Preferred Alternative used to compare impacts to the F-B LGA.

Public Utilities

As discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), public utilities are considered either “high-risk” or “low-risk.” High-risk utilities include electrical lines, natural gas distribution lines, petroleum and fuel pipelines, and electrical substations, while low-risk utilities include communications facilities, irrigation canals, water lines, sewers, stormwater retention ponds, and stormwater pipelines. Points where the proposed rail alignment and associated facilities would overlie existing high-risk or low-risk utilities are described as “conflicts.” Tables 3.6-14 and 3.6-15 (pages 3.6-51 through 3.6-53) in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) quantify utility conflicts along the Fresno to Bakersfield Section of the HSR system. The May 2014 Project alignment and the F-B LGA would also traverse the types of high-risk and low-risk utilities identified in these tables and discussed in the impact analysis provided in Section 3.6.4.

Major public utilities in the study area for the May 2014 Project include facilities for electricity, natural gas, and petroleum distribution; telecommunications; potable and irrigable water delivery; and stormwater, wastewater, and solid-waste disposal. Public utilities and energy providers in the study area for the May 2014 Project are identified in Table 3.6-1.

Table 3.6-1 Study Area Utility and Energy Providers

Utility Type		Provider	Jurisdiction
Electrical		Pacific Gas & Electric Company (PG&E)	Western Kern County
		Southern California Edison	Eastern Kern County
Natural Gas		PG&E	Western Kern County
		Sempra	Kern County (Shafter, Bakersfield)
		Shell Oil Company	Kern County (Bakersfield)
Petroleum and Fuel Pipelines		ConocoPhillips	Kern County (Bakersfield)
		ExxonMobil Corporation	Kern County (Bakersfield)
		Shell Oil Corporation	Kern County (Bakersfield)
		British Petroleum	Kern County (Bakersfield)
		Chevron Corporation	Kern County (Bakersfield)
Communications	Telephone	AT&T	Kern County
	Cable/Internet	Various	Kern County
Water Supply ¹		Arvin-Edison Water Storage District	Kern County
		California Water Service Company	Kern County

Utility Type	Provider	Jurisdiction
	Kern County Water Agency Improvement District No. 4	Kern County
	North Kern Water Storage District	Kern County
	Shafter-Wasco Irrigation District	Kern County (Shafter, Wasco)
	East Niles Community Services District	Kern County
	North of the River Municipal Water District	Kern County
	Oildale Mutual Water Company	Kern County
	Cawelo Water District	Kern County
Sewer/Wastewater	City of Shafter, Public Works Department	City of Shafter
	North of River Sanitary District (7th Standard Road Wastewater Treatment Facility)	City of Shafter
	City of Bakersfield, Public Works (Wastewater Treatment Facility #2)	City of Bakersfield
	Kern Waste Management Department (Kern Sanitation Authority Wastewater Treatment Plant)	Kern County
Stormwater	City of Shafter	City of Shafter
	City of Bakersfield	City of Bakersfield
	Kern County	Kern County
Solid Waste Collection ²	Bena, Boron, Mojave-Rosamond, Ridgecrest, Shafter-Wasco, Taft, and Tehachapi Landfills	Kern County

¹ Figures 3.8-3a and 3.8-3b, Water Districts, in Section 3.8, Hydrology and Water Resources, of this Draft Supplemental EIR/EIS show the alignment of water district boundaries along the F-B LGA.

² Table 3.6-9 (Landfill Facility Summary for Kern County) of the *Fresno to Bakersfield Section Final EIR/EIS* provides the following information regarding solid waste collection facilities in the study area: permitted daily disposal capacity (tons/day), remaining capacity (million cubic yards), estimated closure date, and actual daily disposal volume (tons/day).

Electrical Transmission Lines

PG&E provides electricity to much of Northern California, from approximately Bakersfield to the Oregon border. The company's generation portfolio includes hydroelectric facilities, a nuclear power plant, and a natural-gas-fired power plant. PG&E provides electrical service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California. In the study area, PG&E provides electricity to western Kern County. Southern California Edison provides electricity to those areas not served by PG&E. Southern California Edison serves more than 14 million people in a 50,000-square-mile area of central, coastal, and Southern California (Authority and FRA 2014: page 3.6-19).

The May 2014 Project would traverse a number of electrical transmission lines along its alignment. There are no electrical substations along the May 2014 Project alignment.

High-Pressure Natural Gas Pipelines

PG&E, Sempra, and Shell Oil Company provide natural gas service and are responsible for maintaining the infrastructure for natural gas distribution in the study area (Authority and FRA 2014: page 3.6-20).

Petroleum and Fuel Pipelines

California is the third-largest oil-producing state in the United States, and many of the onshore oilfields are in the San Joaquin Valley between Fresno and the Tehachapi Mountains. All oil produced is processed into fuels and other petroleum products at refineries in the San Francisco Bay Area and Southern California. As a result, crude oil pipelines run throughout the study area. These pipelines are owned and operated by ConocoPhillips, ExxonMobil Corporation, Shell Oil Corporation, British Petroleum, Chevron Corporation, and Kinder Morgan (Authority and FRA 2014: page 3.6-20).

Communication Facilities

Communication facilities in the study area are owned and operated by AT&T, Verizon Telecom, Sprint, Quest, Comcast Cable, and Charter Communication Cable companies. Other communication service providers may also own or lease cellular service or microwave towers and antennas, or telecommunication cable or overhead distribution lines. Underground or aboveground components of this infrastructure are located in the study area (Authority and FRA 2014: page 3.6-20).

Water Supply Infrastructure

Surface water and groundwater are the basic sources of drinking water and irrigation in the region. Municipal service providers typically use groundwater sources. However, surface water sources may also supplement supplies. Many residents in rural and unincorporated areas rely on private groundwater wells for drinking water. Agricultural water users augment their groundwater supplies with surface water that is conveyed through a network of natural and constructed channels. Irrigation of agricultural land is the primary water use in the San Joaquin River region. Numerous large- and small-scale districts provide municipal and irrigation water service to the communities in the study area. The predominant domestic water source in unincorporated portions of the study area is individual private well systems.

Water districts in the study area are identified in Table 3.6-1. Predominant water uses are for agricultural, municipal, groundwater recharge, and transfer to other groundwater agencies.

Wastewater Infrastructure

Generally, onsite sewage systems (e.g., septic tanks) treat rural and low-density areas of the study area. Table 3.6-2 summarizes municipal wastewater systems for the urban areas of the study area, which are discussed further below.

Table 3.6-2 Wastewater Treatment Plants

Jurisdiction	Agency	WWTP Name	WWTP Address	Average Flow/Capacity Flow (mgd)
Kern County	Kern Waste Management Department	Kern Sanitation Authority Wastewater Treatment Plant	4101 Kimber Avenue, Bakersfield CA	4.0/6.0
City of Shafter	City of Shafter Public Works Department and North of River Sanitary District	7th Standard Road Wastewater Treatment Facility	28970 7th Standard Road	5.32/7.50
City of Bakersfield	City of Bakersfield Public Works	City of Bakersfield Wastewater Treatment Facility #2	Mt. Vernon Avenue and White Lane	16.5/25.0

Source: Authority and FRA, 2014

Storm Drains

Storm drain systems are more prominent in developed urban areas. In the rural areas, roadside ditches, irrigation canals, and natural drainages convey stormwater runoff. The storm drainage systems in the study area reflect the limited annual rainfall and relatively flat topography of the region. The systems convey stormwater runoff to retention or detention basins, typically for groundwater recharge (Authority and FRA 2014: page 3.6-27).

As mentioned in Table 3.6-1, stormwater facility providers include the City of Shafter and the City of Bakersfield. More rural facilities are also provided and maintained in unincorporated Kern County by jurisdictions including Kern County, the North Kern Water Storage District, and the Kern Delta Water District.

Solid Waste Facilities

Under the Resource Conservation and Recovery Act and Assembly Bill 939, affected county or municipal solid waste disposal facilities are required to plan for non-hazardous solid waste facility expansions, or addition from all anticipated sources. Following reuse or recycling, anticipated HSR solid waste disposal volumes destined for county and municipal facilities would be considered in the mandated five-year Countywide Siting Element review process, along with all other prospective sources, and eventually included in the affected Integrated Water Management Plan documentation (Authority and FRA 2014: page 3.6-31).

The May 2014 Project would not directly affect active solid waste disposal facilities (i.e., landfills) or recycling facilities. Table 3.6-3 lists the permitted daily disposal capacities, remaining capacities, and estimated closure dates for the Kern County landfills in the vicinity.

Table 3.6-3 Landfill Facility Summary for Kern County

Facility Name	Activity	Location	Permitted Daily Disposal Capacity (tons/day)	Remaining Capacity (million cubic yards)	Permitted Disposal Area (acres)	Estimated Closure Date	Actual Daily Disposal Volume (tons/day)
Shafter-Wasco Sanitary Landfill	Solid waste landfill	17621 Scofield Avenue, Shafter, CA	900	7.90	135	2027	321
Bakersfield Metropolitan (Bena) Sanitary Landfill	Solid waste landfill	2951 Neumarkel Road, Caliente, CA	4,500	32.80	229	2038	1,137

Source: Authority and FRA, 2014

The Shafter/Wasco Landfill is Shafter's primary landfill, although the Bena Landfill accepts some refuse from industrial uses in the city. All Bakersfield solid waste is disposed of in county-operated landfills, primarily the Bena Landfill (Authority and FRA 2014: page 36-33).

Energy

The transportation sector in California consumes 38 percent of the state's energy, the industrial sector consumes 23 percent, the residential sector consumes 19 percent, and the commercial sector consumes 20 percent (EIA 2015). These figures are comparable to those presented in the Fresno to Bakersfield Section Final EIR/EIS, which were based on 2008 data. Updated 2013 data is used for the purposes of energy analysis for the F-B LGA.

In California, electricity and natural gas are nearly synonymous with stationary energy usage. Petroleum use is similarly synonymous with transportation energy (CEC 2006). As discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), 2008 energy consumption for transportation was characterized by 96.7 percent petroleum, 2.6 percent ethanol, 0.6 percent natural gas, and 0.1 percent electricity. In 2015, the CEC reports that petroleum continues to account for about 96 percent of the energy used for transportation in California (CEC 2015a).

Energy resources discussed in this affected environment include electricity, natural gas, and petroleum resources.

Electricity

As discussed in Section 3.6.1.1, the study area for electricity is the same as that described in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014). It includes the entire state of California and western states that produce energy that is exported to California. This discussion of electricity focuses on updates to data that have developed since the publication of the Fresno to Bakersfield Section Final EIR/EIS, including as relevant to the electricity demand, generation, transmission, and demand/generation capacity outlook. With the exception of the data provided below, the affected environment for electricity is the same as described in the Fresno to Bakersfield Section Final EIR/EIS.

Demand for electricity can be measured by consumption rates or by peak demand. According to the CEC, total statewide electricity consumption fell from 281,199 gigawatt-hours (GWh) in 2006 to 274,984 GWh in 2010 (CEC 2015b). In 2013, energy consumption in Kern County was approximately 14,947 GWh (CEC 2015c). Peak demand in the San Joaquin Valley has not changed since publication of the *Fresno to Bakersfield Section Final EIR/EIS* (Authority and FRA 2014), and typically occurs in August between 3:00 p.m. and 5:00 p.m.

Generation of electricity is the fastest-growing share of the energy economy in California. The projected net power supply in the grid controlled by the California Independent System Operator (CAISO) for summer 2015 was 54,044 megawatts (MW) (CAISO 2015). In 2014, California companies produced approximately 68 percent of the state's electricity from power plants located in the state and from those located outside of the state but owned by California utilities companies (CEC 2015e). Fuel sources for electric power in California for the year 2005 are presented in Table 3.6-11 (page 3.6-35) in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014). Fuel sources for electric power in California for the year 2011 are presented in Table 3.6-4.

Table 3.6-4 Fuel Sources for Electric Power in California in 2011

Fuel Source	Quantity Used (trillion British thermal units)	Percentage of Fuel Matrix
Coal	19.7	1
Petroleum	11.5	1
Nuclear	383.6	22
Renewable	688.1	40
Natural Gas	630.1	36

Source: United States Department of Energy, 2015

Transmission of California's electricity occurs on a complex system linking generation to distribution while balancing supply and demand on a nearly instantaneous basis. The CAISO is a nonprofit entity that operates California's transmission system and is responsible for the system's reliability and for the nondiscriminatory transmission of energy. In addition to the in-state transmission connections, there are transmission interconnections that connect California's electricity grid with out-of-state electricity utilities. These transmission systems are discussed in

detail in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: pages 3.6-35 and 3.6-36).

Accurate data on electricity demand and generation capacity are important for ensuring continuous power supply as it is needed throughout the state. The statewide projected average summer power supply in 2015 was forecast at 63,822 MW, or approximately 959 MW more than the 2014 weather normalized peak (CAISO 2015). The result is an average planning reserve margin of 39 percent (CAISO 2015). California's population is projected to exceed 49.3 million by 2025 and more than 53 million by 2030, a net increase of 17.8 million over a 30-year period. This projected population increase will require approximately 92 gigawatts of peak summer capacity in 2030 to meet demand and have an adequate reserve margin (CEC 2003). As described in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), projections of in-state generation capacity for 2035 are not possible because generation infrastructure decisions typically are made three to five years in advance of construction. However, the Western Electricity Coordinating Council *2013 Power Supply Assessment* projects that sufficient generation resources are proposed to meet the calculated targets for all subregions analyzed (Western Electricity Coordinating Council 2013).

Petroleum

Automobile travel is the predominant mode of passenger transportation in the study area. In California, historic demand for transportation services and its associated petroleum consumption has mirrored the growth of population and economic output. The *Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report* (CEC 2007), produced by the CEC, indicates that vehicle miles traveled (VMT) in California will increase by approximately 53 percent over the period of 2005 to 2030, for an average VMT increase of 1.71 percent per year. VMTs increase in relation to a variety of factors, including population, household income, and general economic activity. The CEC estimates that on-road gasoline use in California generally increases with increasing VMTs (CEC 2007).

Natural Gas

In 2010, natural gas power plants provided 42 percent of California's electricity. Natural gas used for electricity generation also represented 42 percent of total natural gas demand in California (EIA 2014). Natural gas-fired electricity generation has become the dominant source of electricity in California, fueling about 43 percent of electricity consumption throughout the state (CEC 2015d). Natural gas used for electricity generation in 2011 was 617 billion cubic feet, compared to 2010 and 2012 when gas use for electricity was 736 billion cubic feet and 855 billion cubic feet, respectively (CEC 2015d).

In 2013, proved reserves of U.S. total natural gas increased 31 trillion cubic feet, or approximately 10 percent, to 354 trillion cubic feet. Proved reserves are estimated volumes that analysis of geologic and engineering data demonstrates with reasonable certainty are recoverable under defined economic and operating conditions. Natural gas supplies are not considered to limit California's projected demand (EIA 2014).

3.6.3.2 Fresno to Bakersfield Locally Generated Alternative

As with the May 2014 Project, major public utilities in the study area for the F-B LGA include facilities for electricity, natural gas, and petroleum distribution; telecommunications; potable and irrigable water delivery; and stormwater, wastewater, and solid waste disposal. Public utilities and energy providers identified in Table 3.6-1 for the May 2014 Project study area are the same public utilities and energy providers in the study area for the F-B LGA.

Public Utilities

Major public utilities in the study area for the F-B LGA include facilities for electricity, natural gas, and petroleum distribution; telecommunications; potable and irrigable water delivery; and stormwater, wastewater, and solid waste disposal. Public utilities and energy providers in the study area for the F-B LGA are identified in Table 3.6-1.

Electrical Transmission Lines

Electrical transmission lines and networks in the study area for the F-B LGA are similar to those described above for the May 2014 Project. The proposed alignment would traverse a number of electrical transmission lines. As shown on Figure 3.6-1, transmission lines crossed by the F-B LGA are owned by PG&E, and would primarily be located in and near Bakersfield. There are no electrical substations along the F-B LGA alignment.

High-Pressure Natural Gas Pipelines

PG&E, Sempra, Occidental Petroleum Corporation, Shell, and Kinder Morgan provide natural gas service and are responsible for maintaining the infrastructure for natural gas distribution in the study area (Authority and FRA 2014). As shown on Figure 3.6-2, natural gas pipelines that would be crossed by the proposed F-B LGA alignment are owned by PG&E, Sempra Energy, and Shell Oil.

Petroleum and Fuel Pipelines

The affected environment for petroleum and fuel pipelines under the F-B LGA is similar to that described above for the May 2014 Project. As shown on Figure 3.6-3, petroleum and fuel pipelines that would be crossed by the proposed F-B LGA alignment primarily occur in and near Oildale, just north of Bakersfield. These crossings include pipelines owned by Shell Oil, Chevron, ExxonMobil, and Kinder Morgan.

Communication Facilities

The affected environment for petroleum and fuel pipelines under the F-B LGA is similar to that described above for the May 2014 Project. As shown on Figure 3.6-4, the nearest communication facilities to the proposed F-B LGA alignment is an AM radio broadcast facility located south of the alignment near Oildale and Bakersfield.

Water Supply Infrastructure

The affected environment for water supply infrastructure under the F-B LGA is similar to that described above for the May 2014 Project, and includes the water districts identified in Table 3.6-1. The alignment of the F-B LGA would be served by the same water service providers as discussed above for the May 2014 Project. In the community of Oildale, the proposed alignment for the F-B LGA traverses through the jurisdiction of the Oildale Mutual Water Company. Oildale Mutual Water Company and Highland Park Public Utility District were the original retail suppliers of the water imported and distributed to the Oildale community by the North of the River Municipal Water District, a public water agency formed in 1969 (OMWD 2016). Highland Park Public Utility District later merged with the North of the River Municipal Water District in 1982 (OMWD 2016). Water districts in the project area service multiple purposes, including municipal, agricultural, groundwater recharge, and transfer to other water districts.

Wastewater Infrastructure

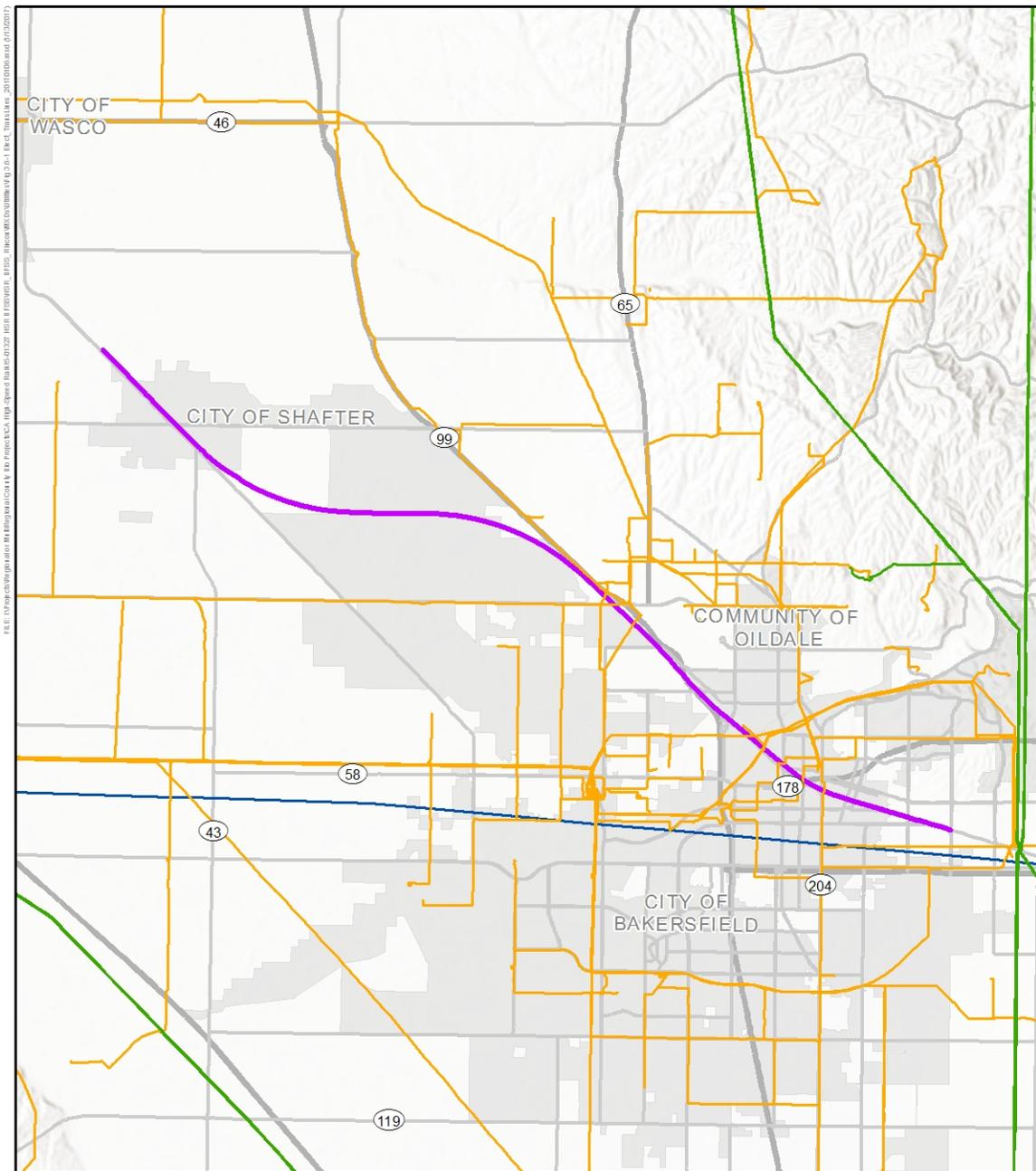
The affected environment for wastewater infrastructure under the F-B LGA is similar to that described above for the May 2014 Project, and includes the municipal wastewater systems identified in Table 3.6-2.

Storm Drains

The affected environment for storm drain systems under the F-B LGA is similar to that described above for the May 2014 Project, and stormwater facility providers are the same as described in Table 3.6-1.

Solid Waste Facilities

The affected environment for solid waste facilities under the F-B LGA is similar to that described above for the May 2014 Project. Solid waste disposal facilities are the same as described in Table 3.6-3.



SOURCE: Platts, "Electric Transmission Lines" metadata (Platts, Division of MacGraw-Hill Companies, Inc., 2009) as cited in Authority and FRA 2014; USGS 30m Hillshade, 2015; U.S. Census Bureau 2014; CHSRA, 2017.

January 13, 2017

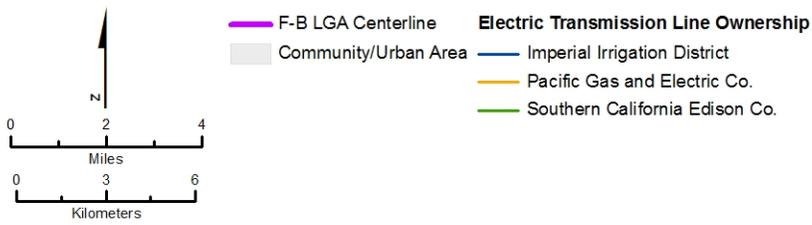
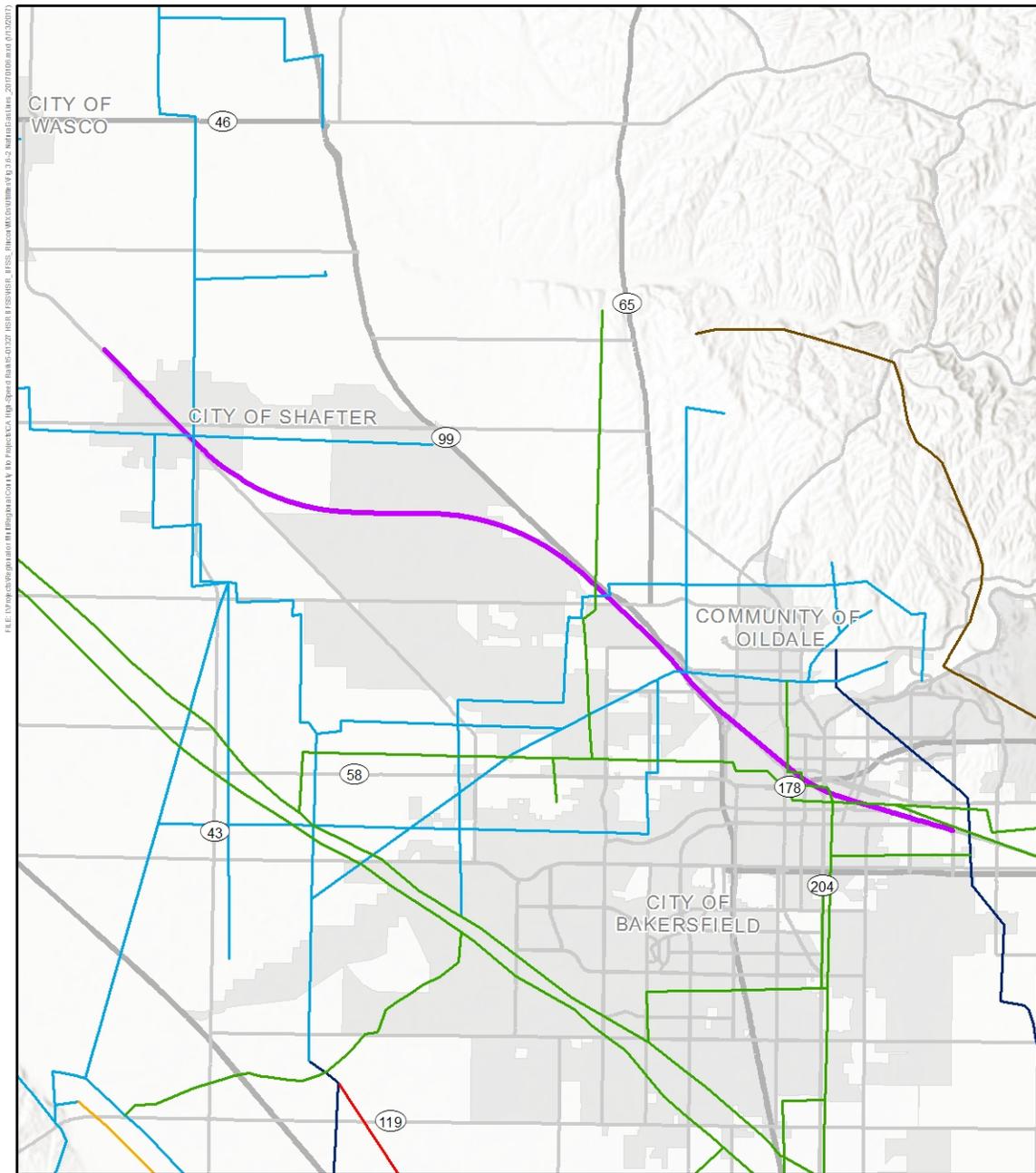


Figure 3.6-1 Electric Transmission Lines



SOURCE: Platts, "Power Map" metadata (Platts, Division of MacGraw-Hill Companies, Inc., 2010) as cited in Authority and FRA 2014; USGS 30m Hillshade, 2015; U.S. Census Bureau 2014; CHSRA, 2017.

January 13, 2017

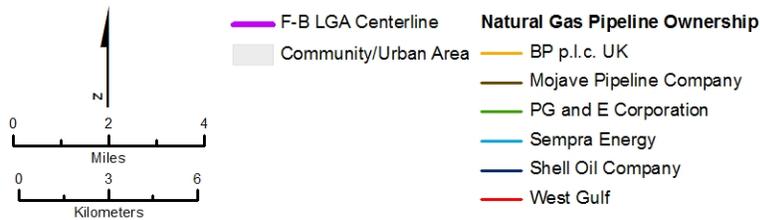
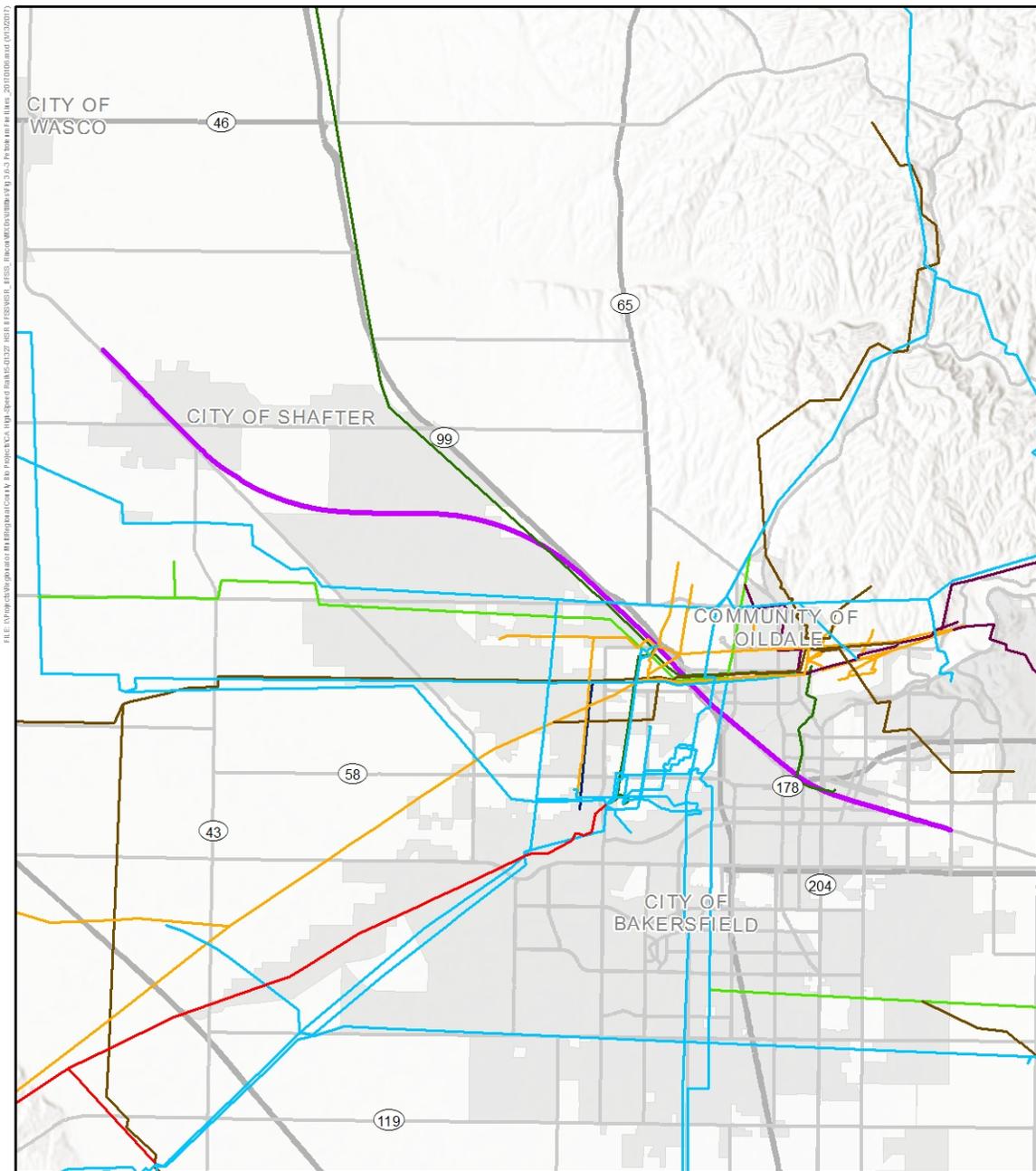


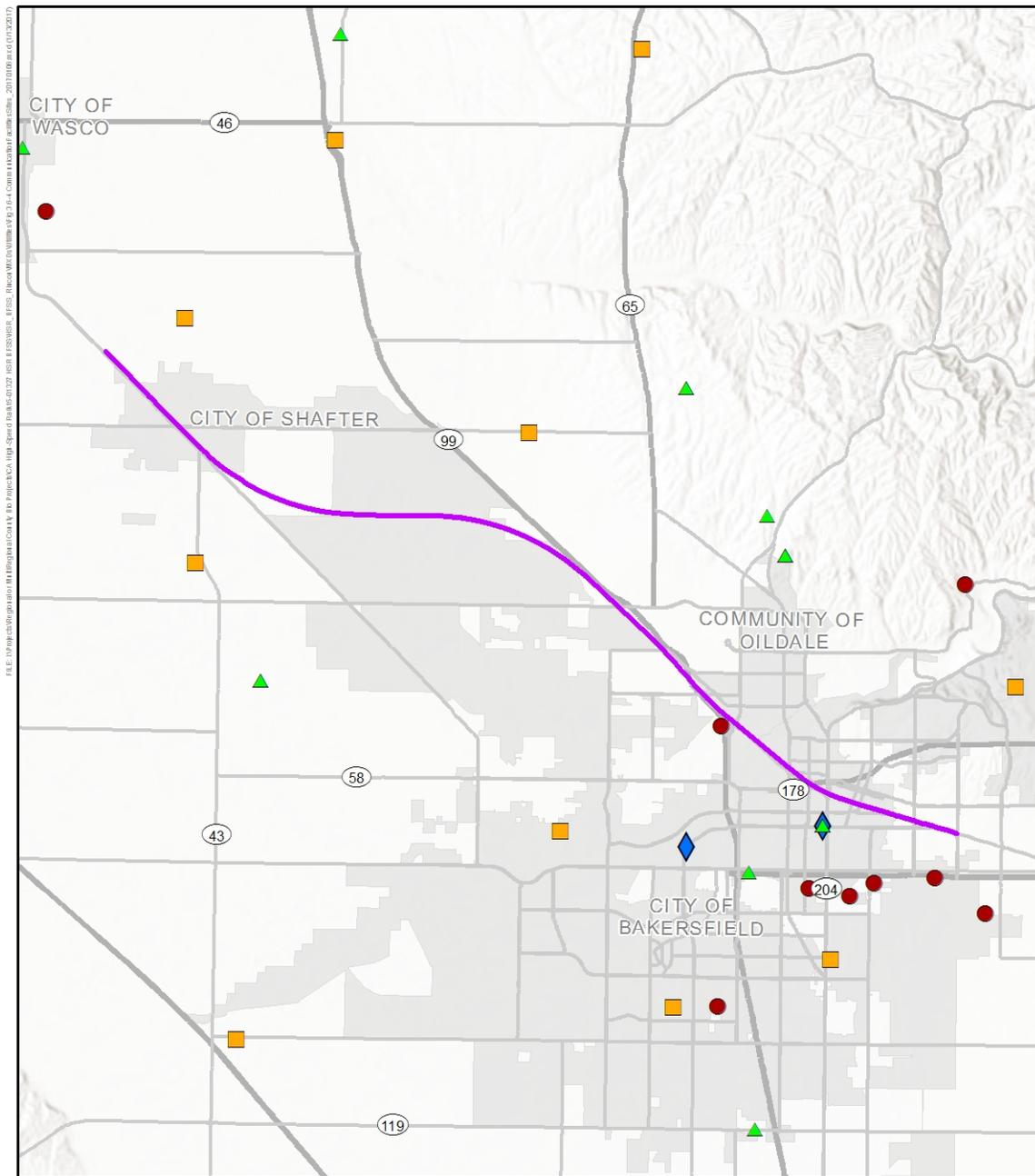
Figure 3.6-2 Natural Gas Transmission Pipelines



SOURCE: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, "National Pipeline Mapping System," metadata (Washington, D.C.: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2004) as cited in Authority and FRA 2014; USGS 30m Hillshade, 2015; U.S. Census Bureau 2014; CHSRA, 2017. January 13, 2017

	F-B LGA Centerline	Petroleum and Fuel Pipeline Ownership	Kinder Morgan Inc.
	Community/Urban Area	BP p.l.c. UK	Shell Oil Company
		Chevron Corporation	Sunland Refining Corp.
		ConocoPhillips	Tricor Refining LLC
		ExxonMobil Corporation	

Figure 3.6-3 Petroleum and Fuel Transmission Pipelines



SOURCE: Federal Communications Commission, Wireless Telecommunications Bureau, Spectrum and Competition Policy Division, "Antenna Structure Registration" metadata (Washington D.C.; Federal Communications Commission) as cited in Authority and FRA 2014; USGS 30m Hillshade, 2015; U.S. Census Bureau 2014; CHSRA, 2017.

January 13, 2017

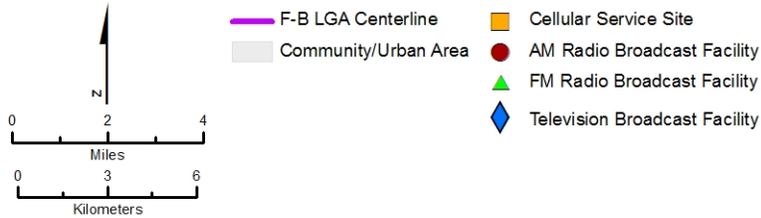


Figure 3.6-4 Communication Facilities and Sites

Energy

Energy resources include electricity, natural gas, and petroleum resources. As discussed for the May 2014 Project, these resources are assessed on a state-wide scale. Energy resources applicable to the F-B LGA are the same as described for the May 2014 Project.

3.6.4 Environmental Consequences

This section provides the impact analysis relating to public utilities and energy. Section 3.6.4.1 in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) provides an overview of impacts described for the May 2014 Project, and Section 3.6.4.2 characterizes impacts that would occur under the F-B LGA.

3.6.4.1 Summary of Analysis for the May 2014 Project

This section provides a summary of those effects of the May 2014 Project using information from the Fresno to Bakersfield Section Final EIR/EIS relevant to the issue areas of utilities, energy, and electrical requirements. Section 3.6 of the Fresno to Bakersfield Section Final EIR/EIS included three appendices:

- Appendix 3.6-A, Existing Plus Project Conditions Energy Analysis
- Appendix 3.6-B, Water Usage Analysis Technical Memorandum
- Appendix 3.6-C, Energy Analysis Memorandum

Of the appendices listed above, 3.6-A and 3.6-C address the statewide HSR system, and Appendix 3.6-B presents project-specific data and analysis related to water usage requirements. For the purposes of this Draft Supplemental EIR/EIS, the statewide analyses (Appendices 3.6-A and 3.6-C) are referenced where applicable, and updated project-specific water usage data (previously identified in Appendix 3.6-B) is now presented in-text in Section 3.6.4.2 of this Draft Supplemental EIR/EIS. Therefore, Appendices 3.6-A through 3.6-C from the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) are not attached to this Draft Supplemental EIR/EIS because the relevant information is incorporated by reference or provided in the text.

Utilities

The May 2014 Project could result in scheduled and accidental interruptions of utility services. The permanent project footprint in some places would be located where current utility lines exist, creating a potential conflict. At some locations, current utility infrastructure would be upgraded and/or extended to serve the HSR system. Utilities inside the permanent project footprint would be either relocated outside the restricted access areas of the HSR right-of-way (ROW), or would be modified (i.e., encased in a pipe sturdy enough to withstand the weight of HSR system elements and allow for maintenance access from outside the HSR ROW) to avoid conflict. Probing for existing underground utilities prior to the start of construction would reduce the risk of accidental service interruptions.

The May 2014 Project would also generate C&D material that would be disposed of in local landfills that have available capacity, and in appropriate facilities for hazardous or potentially hazardous materials. Where feasible, C&D material would be recycled or repurposed to divert it from landfills. Based on anticipated reuse, recycling, and waste diversion that will be implemented during the construction of the HSR, existing landfill capacity is adequate to meet project demands.

Utility demand occurring under the May 2014 Project would not require expansion of existing facilities or construction of new facilities or entitlements related to water and wastewater treatment, or stormwater drainage. The potential effect on these facilities would constitute a less than significant impact under CEQA.

The May 2014 Project alignment would cross existing transmission lines, and modifications to existing transmission lines would be implemented to provide adequate clearance, as needed in coordination with PG&E. The May 2014 Project will require the installation of a 50 kV AC Traction

Electrification System (TES) to power the electric trains. In order to have adequate capacity for train operations, the proposed TES will interconnect into local utility networks at 115 kV or 230 kV, with approximately 30-mile intervals between the traction power substations. This spacing requirement results in five traction power substations situated along the May 2014 Project alignment. All interconnection points require redundant transmission from the point of interconnection (at 115 kV or 230 kV) to supply the TES, with each interconnection connected only to two phases of the transmission source. At each interconnection point, the traction power substation will have two 115/50 kV, or 230/50 kV, single-phase transformers. Both transformers will be rated at 60 megavolt amperes. The autotransformer feed system then steps down the transmission voltage to 50 kV (phase-to-phase), with 25 kV (phase-to-ground) to power the traction system.

These system requirements are assessed in detail in PG&E's *Technical Study Report* evaluating proposed traction power substation interconnections for Sites 4 through 13 (PG&E 2016). Site 13 in Bakersfield, at Casa Loma Substation, is located inside the footprint of the May 2014 Project. The Authority is conducting ongoing efforts and contract negotiations with PG&E to ensure that all necessary utility modifications or expansions are appropriately planned and implemented.

In the event that additional utility relocations are identified during final engineering design of the May 2014 Project and those relocations are situated outside of the footprint evaluated in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), additional CEQA review would be conducted for those relocations as necessary.

Energy

Potential impacts associated with energy use are considered on a statewide basis, due to the geographic extent of the HSR system and California's electricity generation and transmission network, as well as the fact that the HSR system (and associated energy savings) would not be fully operational for almost 25 years. The energy analysis provided in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), therefore, uses a dual baseline approach, and energy impacts are evaluated against existing and "background" conditions that are expected in 2035. Results for both baselines are presented in the main report and in Appendix 3.6-A of the Fresno to Bakersfield Section Final EIR/EIS.

Electrical Requirements of the High-Speed Rail

The electrical demand for the propulsion of the trains and for the operation of the trains at terminal stations and in storage depots and maintenance facilities has been conservatively estimated by project engineers to be 12.66 GWh per day for the 50 percent fare scenario and 8.44 GWh per day for the 83 percent fare scenario (the "fare scenario" refers to ticket prices and what percentage of corresponding airfare is represented by the price of transit on the HSR system). Transmission losses, or the percentage of energy lost due to transmission from the power plant to the project, have been estimated at approximately 4 percent. Applying this factor to the electrical requirement of the HSR system, the total electrical requirement at the power plant would be approximately 13.17 GWh (or 44,900 million Btu [MMBtu¹]) per day for the 50 percent fare scenario and 8.78 GWh (30,000 MMBtu) per day for the 83 percent fare scenario. This change in electrical demand is predicted to occur under the existing conditions plus project scenario and the 2035 build scenario.

The analysis provided in the Fresno to Bakersfield Section Final EIR/EIS estimated the changes in energy use anticipated throughout the state with and without the HSR system. The analysis included estimation of the energy changes from reduced state-wide on-road VMT, reduced intrastate airplane travel, and increased electrical demand. Although the HSR system would result in an increase in electricity demand, it would reduce the energy demands from automobile and airplane travel, resulting in an overall beneficial effect on statewide energy use (Table 3.6-12, 2035 Estimated Change in Energy Consumption due to the HSR system [50 percent to 83

¹ One megawatt [MW] is equivalent to approximately 3.41 MMBtu (IT)/hour [MMBtu/h]

percent Fare Scenario] in the Fresno to Bakersfield Section Final EIR/EIS [Authority and FRA 2014: page 3.6-43]). The payback period for energy used during construction would be two to four years for the Fresno to Bakersfield Section of the HSR system, where two to four years indicates the time required to “pay back” the energy used in construction with operational energy consumption savings of the HSR, prorated to statewide energy savings.

3.6.4.2 Fresno to Bakersfield Locally Generated Alternative

The following sections evaluate direct and indirect impacts of the F-B LGA. As described in the Affected Environment discussion provided in Section 3.6.3, there are a number of utility conflicts along the F-B LGA, comparable to the portion of the Fresno to Bakersfield Section comprised by the May 2014 Project. The F-B LGA would affect the same utility and energy jurisdictions and types of facilities as would be affected under the May 2014 Project, with site-specific differences in where the conflicts occur.

The analysis provided below presents potential impacts to public utilities and energy for two time periods.

- Construction-period impacts, or those that would be of short duration and limited to the construction period
- Project-period impacts, or those that would occur during operation and maintenance of the project and could persist for the lifetime of the project

Where impacts under the F-B LGA would be the same as described for the wider Fresno to Bakersfield Section, the impact discussion below refers to the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) for additional analysis. Detailed discussion of potential impacts specific to the F-B LGA is provided below, as applicable.

Construction-Period Impacts

The construction of any of the F-B LGA facilities could result in planned temporary interruption of utility service, accidental disruption of services, increased water use, and increased waste generation. As discussed in Section 2.4.5.3 of this Draft Supplemental EIR/EIS, the proposed F-B LGA crosses a number of utilities including HV transmission lines, water conveyance pipelines/canals, natural gas pipelines, and fiber-optic lines. To the extent that it is feasible and reasonable, utilities located in the proposed F-B LGA ROW would be relocated to outside of the ROW during the construction period. This may result in temporary disruptions to utility service, as assessed under the following impact discussions.

Impact PU&E#1 – Temporary Interruption of Utility Service

Potential impacts of the F-B LGA associated with temporary interruption of utility service would occur in the same way as for the May 2014 Project, with the exception that site-specific crossings would be different where the proposed rail alignments and auxiliary facilities vary in location. As with the May 2014 Project, high-risk and low-risk utility crossings would occur under the F-B LGA, and construction could require the temporary shutdown of utility lines such as water, sewer, electricity, petroleum, or gas to safely move or extend these lines. Implementation of the project will adhere to the National Electrical Safety Code, a United States standard for the safe installation, operation, and maintenance of electric power and communication utility systems (including power substations, power and communication overhead lines, and power and communication underground lines).

The types of HV transmission tower modifications that may occur with implementation of the F-B LGA include the following:

- The overall height of existing HV transmission towers would be raised in order for the power conductors to clear F-B LGA facilities in accordance with CPUC requirements and PG&E standards
- Existing steel lattice towers or steel truss towers would be modified at their existing locations to provide necessary clearance.

- Existing HV transmission timber poles would be replaced with new, taller timber poles or tubular steel poles depending on the height adjustment required.
- Should an HV steel lattice tower or steel truss tower be determined through the evaluation and structural analysis process to be inadequate for modifying, then the tower would be replaced with a new tubular steel poles.
- Existing towers located too close to the F-B LGA would be relocated horizontally if any portion of the existing HV transmission tower would impact the F-B LGA viaduct in the event the existing tower should fall over. If the tower is determined to be too close to the F-B LGA, the relocated tower would be placed 200 feet clear of the F-B LGA right-of-way.

High-voltage transmission lines along the F-B LGA alignment would need to be modified in five areas in order to accommodate implementation of the proposed F-B LGA. These locations and modifications are summarized below and described in further detail in Section 2.4.5.3 of this Draft Supplemental EIR/EIS.

- **Coffee Road, Shafter (115-Kilovolt Line).** Two HV towers are located perpendicular to Coffee Road in Shafter, east and west of the F-B LGA alignment. The existing 60-foot-tall towers would be raised to provide clearance for the F-B LGA alignment.
- **7th Standard Road, City of Shafter/Bakersfield (115-Kilovolt Line).** Two HV towers are located parallel to 7th Standard Road in Shafter. The existing 80- and 110-foot-tall towers would be raised to provide clearance for the F-B LGA alignment.
- **Southwest of State Route 99 and northeast of Lerdo Canal, City of Bakersfield (70-Kilovolt Line).** Two HV towers are located on vacant land southwest of SR 99 and northeast of Beardsley Canal in Bakersfield, east and west of the F-B LGA alignment. The existing 110-foot-tall towers would be raised to provide clearance for the F-B LGA alignment.
- **West/East of State Route 204 Near the Kern County Water Agency Treatment Plant and Kern River, City of Bakersfield (115-Kilovolt Line).** Two HV towers are located east and west of SR 204 on land near the Kern County Water Agency treatment plant and Kern River, as well as the Union Pacific Railroad in Bakersfield. The existing 110-foot-tall towers would be raised to provide clearance for the F-B LGA.
- **Adjacent to Sam Lynn Ball Park and Parallel to Elm Street, City of Bakersfield (115-Kilovolt and 70-Kilovolt Mixed Voltage).** Three HV towers are located near Sam Lynn Ball Park, two are located in the proposed F Street Station area, and two are parallel to Elm Street in Bakersfield. The existing 110-foot-tall towers would be raised to provide clearance for the F-B LGA. As described in Section 2.4.5.3 of this Draft Supplemental EIR/EIS, the towers would be sited to avoid conflicts with the City of Bakersfield/Kern County Water Agency Carrier Canal property.

The transmission towers that would be modified with implementation of the F-B LGA would be evaluated by an Authority engineering contractor (who will be approved by PG&E). Existing tower conditions would be evaluated and a structural analysis performed to evaluate the feasibility of modifying the existing HV transmission towers. Where necessary, project design and phasing of construction activities would be implemented to minimize utility interruptions, including for upgrades of existing power lines to connect the HSR system to existing PG&E substations. Prior to construction in areas where utility service interruptions are unavoidable, the contractor would notify the public through a combination of communication media (e.g., by phone, email, mail, newspaper notices) in that jurisdiction and the affected service providers of the planned outage. The notification would specify the estimated duration of the planned outage and would be published no fewer than seven days prior to the outage. Construction would be coordinated to avoid interruptions of utility service to hospitals and other critical users.

Construction of the F-B LGA may require upgrades to existing PG&E infrastructure to meet the projected power demands of the HSR system. However, as discussed in Section 2.1.5 of this Draft Supplemental EIR/EIS, PG&E network upgrades would not be immediately needed. If

PG&E determines that network upgrades are needed (e.g., conductor replacement), it will be the result of accumulation of increased power demands from other users on a given circuit, and not necessarily just the addition of load demand from HSR operations. There may be substation upgrades needed to serve the HSR project, but it will generally be circuitry modifications needed to supply power for the Traction Power Substation Site. In addition to this work, the Authority will be constructing its own interconnections from the PG&E system to the HSR system. Planned and temporary interruptions of electrical utilities service associated with construction would be of short duration, and the public would be notified of planned interruptions in accordance with detailed procedures that would occur prior to any anticipated interruption to utility services. Therefore, potential impacts would be less than significant under CEQA.

Impact PU&E#2 – Accidents and Disruption of Services

During construction, the potential for accidental disruption of utility systems, including overhead utility lines (e.g., telephone, fiber optic systems, and cable television) and buried utility lines (e.g., water, wastewater, petroleum, and natural gas lines) is low due to the established practices of utility identification and notification that occur in advance of any project-related, ground-disturbing activities. In addition, California Government Code Section 4216 establishes required procedures for identifying buried utilities prior to initiating excavation. In compliance with California Government Code Section 4216, the construction contractor would use a utility locator service and manually probe for buried utilities inside the construction footprint prior to initiating ground-disturbing activities. This would avoid accidental disruption of utility services. Transmission lines between the transmission power supply stations and the existing substations would be improved or constructed aboveground to industry standards, and would not conflict with services provided using existing infrastructure. Implementation of these standards during construction would minimize the likelihood of accidental disruption of service. In addition, potential disruptions would be temporary and limited to localized areas. Therefore, potential impacts associated with accidents and disruption of services would be less than significant under CEQA.

Impact PU&E#3 – Water Demand during Construction

Construction activities would use water to prepare concrete, control dust, wash equipment tires and parts as needed, and re-seed disturbed areas. Table 3.6-5 shows the estimated construction-related water use purposes and rates along the proposed F-B LGA and associated facilities.

Table 3.6-5 Construction Water Use Summary¹

Facility	Item	Total Volume (MG)	Total Volume (acre-feet)	Annualized Water Use ² (acre-feet/year)
F-B LGA Rail Alignment				
23.13 miles	Concrete Work	40.28	123.36	24.74
	Earth Work	5.42	16.62	3.25
	Dust Control (tracks)	128.78	395.56	79.11
	Irrigation (tracks)	29.08	89.41	17.88
	<i>Total</i>	<i>196.51</i>	<i>603.27</i>	<i>124.98</i>
Maintenance of Infrastructure Facility (MOIF)⁴				
28 acres	Concrete Work ³	14.67	44.01	9.78
	Dust Control	132.02	405.83	80.68
	Irrigation	14.67	41.56	7.33
	<i>Total</i>	<i>161.35</i>	<i>491.39</i>	<i>97.79</i>

Facility	Item	Total Volume (MG)	Total Volume (acre-feet)	Annualized Water Use ² (acre-feet/year)
F Street Station³				
45.46 acres	Concrete Work	2.24	6.72	1.31
	Dust Control	31.36	96.32	19.23
	Irrigation	1.12	3.55	0.75
	<i>Total</i>	<i>34.72</i>	<i>106.59</i>	<i>21.28</i>
Maximum Use Total		392.59	1,201.25	244.05

¹ Construction water use for the F-B LGA was estimated by extrapolating water use quantities on a per-mile or per-acre basis, as identified in Appendix 3.6-B of the *Fresno to Bakersfield Section Final EIR/EIS*.

² Annualized water use is for a five-year construction period (for consistency with the approach used in the *Fresno to Bakersfield Section Final EIR/EIS*).

³ Assumed that the water use values for the F Street Station would be the same as the values for the Kings/Tulare Station-West Station analyzed in the *Fresno to Bakersfield Section Final EIR/EIS*, as the acreage of that station (48 acres) was the most comparable to the proposed F Street Station (46.45 acres) analyzed in this Draft Supplemental EIR/EIS.

⁴ Assumed that construction water uses at the MOIF would be comparable to a heavy maintenance facility site as analyzed in the *Fresno to Bakersfield Section Final EIR/EIS*.

MG = million gallons

As noted in Table 3.6-5, total construction water use associated with the F-B LGA would be approximately 1,201.25 acre-feet, for an annualized (over five years) construction water usage of approximately 244.05 acre-feet per year. In order to estimate how water use patterns and intensities may be affected by implementation of the F-B LGA, this analysis includes an estimation of existing water usage along the project footprint (following the same approach used in Appendix 3.6-B of the *Fresno to Bakersfield Section Final EIR/EIS* [Authority and FRA 2014]). Table 3.6-6 provides these estimates, accounting for the proposed rail alignment for the F-B LGA, the MOIF, and the F Street Station (Bakersfield passenger station).

Table 3.6-6 Existing Water Use for the F-B LGA

Project Feature	Current Land Use	Acres	Water Use Factors ¹ (acre-feet/ acres/year)	Annual Water Use (acre-feet/year)
F-B LGA – Rail Alignment	Single-Family	1.46	3.5	5.12
	Multi-Family	1.79	6.2	11.12
	Commercial	9.54	1.9	18.12
	Industrial	86.06	1.9	163.51
	Institutional	63.45	1.9	120.55
	Agricultural	291.88	2.91	849.38
	Roadways/ROW/No Data	269.31	1.9	511.68
	<i>Total</i>	<i>723.49</i>	-	<i>1,679.49</i>
MOIF	Single-Family	0.00	3.5	0.00
	Multi-Family	0.00	6.2	0.00
	Commercial	0.00	1.9	0.00
	Industrial	18.55	1.9	35.25
	Institutional	0.00	1.9	0.00
	Agricultural	31.32	2.91	91.14

Project Feature	Current Land Use	Acres	Water Use Factors ¹ (acre-feet/ acres/year)	Annual Water Use (acre-feet/year)
	Roadways/ROW/No Data	1.08	1.9	2.05
	<i>Total</i>	<i>50.95</i>	-	<i>128.44</i>
F Street Station	Single-Family	0.00	3.5	0.00
	Multi-Family	0.00	6.2	0.00
	Commercial	7.50	1.9	14.25
	Industrial	13.88	1.9	26.37
	Institutional	8.17	1.9	15.52
	Agricultural	0.00	2.91	0.00
	Roadways/ROW/No Data	14.86	1.9	28.23
	<i>Total</i>	<i>44.41</i>	-	<i>84.37</i>
TOTAL		994.06	n/a	1,892.3

¹ Water use factors from the *Fresno to Bakersfield Section Final EIR/EIS* (Appendix 3.6-B) were used for this analysis, with the exception of the Agriculture Water Use Factor, which was updated per new Kern County data derived from the California DWR Irrigated Crop Acres and Water Use Information by County (DWR 2010). A county-specific weighted average for all crop types was used. No water use factors were available for Roadways/ROW/No Data land uses; therefore, an estimated water use factor of 1.9 was applied, as it seemed likely that water use on such land parcels would not be more than for commercial, industrial or institutional land uses (as described in Appendix 3.6-B of the *Fresno to Bakersfield Section Final EIR/EIS*).

DWR = Department of Water Resources

A comparison of the water use totals presented in Table 3.6-5 and Table 3.6-6 indicates that less water use would occur along the F-B LGA during construction, as compared to existing water uses associated with land uses along the alignment (244.05 acre-feet per year during construction of the F-B LGA, versus 1,892.3 acre-feet per year of ongoing water use associated with identified land uses along the alignment, including the Northern Shafter MOIF and the F Street Station). The acreages of land use types shown in Table 3.6-5 and Table 3.6-6 reflect the physical footprint of the proposed F-B LGA (i.e., only the physical area that would be converted from existing land uses under the project).

Water supply providers along the study area are listed in Table 3.6-1. During construction of the F-B LGA, it is anticipated that the same water sources currently used to provide water supply for uses along the alignment would also be used to provide construction-related water needs. Existing water uses along the alignment would be reduced under the F-B LGA because project-related water requirements would be less intense than water requirements associated with existing land uses along the proposed F-B LGA (as described above, water use factors were applied to acres of existing land uses inside the footprint of the proposed alignment, including the MOIF and passenger station, in order to estimate current water usage rates). Water used during construction of the project would be offset by the reduction in water uses at the properties acquired inside the proposed footprint area, due to the land use conversion. Overall, the F-B LGA would decrease water supply requirements in the study area and existing water supply would sufficiently meet the needs for construction activities.

Existing water supply is sufficient for the anticipated water use during construction, and construction of the F-B LGA would require neither construction nor expansion of a water treatment facility and would also not require new or expanded entitlements for water. This would result in a less than significant impact under CEQA.

Impact PU&E#4 – Waste Generation during Construction

During construction of the F-B LGA, waste would be generated as a result of vegetation clearing, removal of existing asphalt and gravel, and demolition of existing structures. The Fresno to

Bakersfield Section of the HSR would generate an estimated 2.6 million cubic yards of solid waste, as discussed in detail in Impact PU&E#4 in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: pages 3.6-49 and 3.6-50). The F-B LGA comprises approximately 18 percent of the total Fresno to Bakersfield Section of the HSR system, accounting for the length of the alignment between the F-B LGA's northern and southern termini. It is therefore assumed that the F-B LGA would generate approximately 18 percent of the quantity of C&D waste associated with the Fresno to Bakersfield Section, equating to approximately 468,000 cubic yards of solid waste. In comparison, as noted in Table 8-A-11 of this Draft Supplemental EIR/EIS, Summary of Differentiating Features between the May 2014 Project and F-B LGA, the May 2014 Project would generate an estimated 484,068 cubic yards of solid waste. These estimates are an extrapolation based on the length of the F-B LGA and May 2014 Project alignments, and do not detail waste generation associated with project facilities such as the MOIF and passenger station.

As standard practice, the construction contractor would divert C&D waste from landfills by reusing or recycling to aid to the extent practicable with the implementation of the Local Government Construction and Demolition Guide (Senate Bill 1374) and to meet solid waste diversion goals. Additionally, the 2010 Green Building Standards Code requires every city and county in California to develop a waste management plan and divert at least 50 percent of the construction materials generated from any project in the state. The Authority's 2013 sustainability policy further specifies that all (100 percent) of the steel and concrete waste generated during construction will be recycled and a minimum of 75 percent of construction waste will be diverted from landfills (Authority 2013).

The design-build contract will require the design-build contractor to prepare and implement a Sustainability Management Plan that establishes how construction waste will be diverted from landfills to recycling centers. For example, the Authority has received and approved Sustainability Management Plans from the design-build contractor for Construction Package 1 (Tutor Perini, Zachry, Parsons 2013) and Construction Package 2/3 (Dragados Flatiron Joint Venture 2016). Tutor Perini, Zachry, Parsons estimates that it will divert 81 percent of waste from the landfills (page 17), and Dragados Flatiron Joint Venture estimates a diversion of 92 percent of materials from building demolition and 100 percent from streets, sidewalks, and driveways (page 14).

Landfills in the study area are identified in Table 3.6-1 and Table 3.6-3. The specific landfills to which C&D material from the project would be sent have not been identified. However, as discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), there are a number of active landfills with sufficient disposal capacity in the study area. Other regional facilities may also be used, particularly for disposal of hazardous wastes, as needed. The Fresno to Bakersfield Section Final EIR/EIS discusses requirements for disposal and diversion of C&D waste. These requirements are also applicable to the F-B LGA, including those related to landfill use and hazardous waste disposal. The F-B LGA would comply with federal, state, and local statutes and regulations related to solid waste. Thus, there exists sufficient, permitted capacity at the landfills serving the area to accommodate solid waste disposal needs.

Hazardous wastes generated during C&D activities would be handled, stored, and disposed of by the Authority in accordance with applicable requirements. A certified hazardous waste collection company would deliver the waste to an authorized hazardous waste management facility for recycling or disposal, including the Kettleman Hills Landfill, an in-state facility that accepts hazardous waste. The Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) discusses in detail an anticipated expansion of the Kettleman Hills Landfill due to implementation of the B-20 landfill addition, which would provide permitted capacity for the disposal of hazardous and designated waste for an additional 24 years. This landfill would therefore have sufficient capacity to accommodate disposal of hazardous wastes associated with construction of the F-B LGA. Under CEQA, the impact on permitted landfills that would serve the project would be less than significant.

Impact PU&E#5 – Energy Consumption during Construction

Although Section 3.6.2.3 does not identify a CEQA criterion specific to energy consumption, according to Appendix F of the CEQA Guidelines, EIRs must discuss the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Wise and efficient use of energy may include decreasing overall per-capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. Significant long-term operational or direct energy impacts would occur if the project would place a new demand on regional energy supply or require significant additional capacity, or significantly increase peak and base period electricity demand.

During construction of the F-B LGA, energy would be required to produce and transport construction materials to work areas along the project footprint, and to transport C&D material away from the work area for recycling and disposal. The operation and maintenance of construction equipment would also consume energy resources. Energy used for the construction of track work, guideways, maintenance yards, stations, support facilities, and other structures would be a one-time requirement and would create a non-recoverable energy cost.

Energy consumption during construction of the F-B LGA was estimated by applying energy use factors associated with project facilities of the May 2014 Project (as identified in the Fresno to Bakersfield Section Final EIR/EIS [Authority and FRA 2014]), including those related to lengths of at-grade versus elevated or below-grade design. Using this methodology, Table 3.6-7 provides an overview of energy consumption associated with the F-B LGA.

Table 3.6-7 Construction Energy Consumption Assumptions for the F-B LGA

HSR Alignment	At-Grade Design ²	Elevated/Below-Grade Design ²	Passenger Stations	MOIF ²	Total
Energy Consumption Factor ¹	19.11 billion Btu/one-way guideway mile	55.63 billion Btu/one-way guideway mile	78 billion Btu/station	38.22 billion Btu/MOIF ³	–
Guideway Miles ²	10.52	12.61	1 Station	1 MOIF	–
Energy Consumption (billion Btu)	201.04	701.49	78	38.22	1,018.75

¹ Energy consumption factors are identified in the *Fresno to Bakersfield Section Final EIR/EIS*, Section 3.6.3.1, Table 3.6-2.

² Of the total 23.13 guideway miles for the F-B LGA, 10.52 miles would be at-grade and 12.61 miles would be of elevated or below-grade design.

³ The Energy consumption factor for the MOIF is based on the energy consumption factor for two guideway miles.

Direct energy involves all energy consumed by vehicle propulsion (e.g., automobiles and airplanes). This energy is a function of traffic characteristics such as volume, speed, distance traveled, vehicle mix, and thermal value of the fuel being used. This energy also includes the electrical power requirements of the HSR system, including recoverable energy during train braking, as well as aircraft fuel. Indirect energy consumption involves the non-recoverable, one-time energy expenditure involved in constructing the physical infrastructure associated with the project, typically through the irreversible burning of hydrocarbons for operating equipment and vehicles in which energy is lost to the environment.

Energy impacts caused by the project might include the additional consumption of electricity required to power the HSR system (direct use) and consumption of resources to construct the proposed HSR facilities (indirect use). Energy used for vehicle propulsion is a function of traffic characteristics and the thermal value of the fuel used. Petroleum consumption rates for vehicle travel were derived from the travel demand forecast for the HSR and growth projections performed by the CEC. These consumption rates were used to determine the amount of petroleum used for transportation under the HSR sections, including the Fresno to Bakersfield Section, and portions of the Fresno to Bakersfield Section comprised by the May 2014 Project and the F-B LGA (as shown in Table 3.6-7).

Although measurable, the energy used for project construction would not require significant additional capacity, and would not significantly increase peak- or base-period demands for electricity or other forms of energy. Energy efficiency is assumed for the offsite production of construction materials (Authority and FRA 2005) based on the cost of nonrenewable resources and the economic incentive for efficiency. Standard best management practices would be implemented onsite so that nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner.

As mentioned in the discussion of construction waste management, the design-build contract will require that the design-build contractor prepare and implement a Sustainability Management Plan that establishes strategies for minimizing energy use during construction. As an example of measures that could be implemented in its approved plan, Tutor Perini, Zachry, Parsons identifies five strategies for minimizing energy use (pages 10–12):

- Utilize renewable energy sources
- Utilize efficient lighting fixtures and natural lighting
- Reduce energy consumption by computers and network equipment
- Utilize sustainable methods for temperature control
- Utilize energy-efficient appliances

Dragados Flatiron Joint Venture plans to implement five additional energy-reduction measures to the reduction measures listed above (page 17):

- Participate in energy-efficient programs at leased facilities (e.g., Leadership in Energy and Environmental Design and Energy Star)
- Use solar power equipment in the field when possible
- Use “cool roof” technology when possible
- Streamline delivery of materials
- Coordinate ride sharing for workers

Similar measures would be applied during construction of the F-B LGA.

As discussed in the Fresno to Bakersfield Section Final EIR/EIS (page 3.6-5) (Authority and FRA 2014), the Energy Element of the Kern County General Plan defines the critical energy-related issues facing the county and sets forth goals, policies, and implementation measures to protect the energy resources of the county, to encourage orderly energy development, and to afford the maximum protection for the public’s health and safety, and for the environment. Additionally, the Authority will produce a sustainability report annually. Following the example of peer organizations (HSR agencies and major transportation agencies) the report will contain a subset of indicators recommended by the Global Reporting Initiative. If required by regulation or other stakeholder interest, the Authority will undertake the steps and procedures necessary to enable its environmental and sustainability claims to be audited and verified in compliance with the International Standards Organization 14001 standard (Authority 2013).

Additional discussion of energy consumption during construction is provided in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: pages 3.6-13 through 3.6-44), including discussion related to the energy payback period, the number of years required to “pay back” the energy used in construction through operational energy savings prorated to statewide energy savings. The Fresno to Bakersfield Section would contribute approximately 14 percent to the HSR energy demand as well as to annual energy savings (approximately 5,278,000 to 7,910,000 MMBtu/day, depending on the fare scenario). As such, the payback period for energy consumed during construction would be approximately two to four years of full project operations because the project will remove less energy-efficient cars and planes from the system.

As noted above, significant long-term operational or direct energy impacts would occur if the project would place a substantial new demand on regional energy supply, require significant additional capacity, or significantly increase peak- and base-period electricity demand. However,

as discussed, the project would employ energy-saving features where feasible, and the overall energy payback period would be limited to two to four years. Therefore, the F-B LGA would not place substantial new demand on regional energy supply, require significant additional capacity, or significantly increase peak- and base-period electricity demand. The effect of indirect use of energy for construction of the F-B LGA would be less than significant under CEQA.

Project-Period Impacts

The operation and maintenance of the proposed F-B LGA could result in permanent impacts to public utilities and energy, including the following:

- Relocation and extension of utilities
- Reduced access to existing utilities in the project footprint
- Increased demand for water, wastewater, and waste disposal services in certain locations, including the passenger station and MOIF

Impact PU&E#6 – Conflicts with Existing Utilities

As discussed under Impact PU&E#1, many utilities are located in or traverse the study area for the proposed F-B LGA and associated facilities. These crossings are referred to as “utility conflicts.” During construction of the project, there may be temporary disruptions in utility service during planned relocations of certain facilities, where utility conflicts occur. As with the May 2014 Project, the F-B LGA would avoid, protect, or relocate existing utility infrastructure as needed to avoid conflicts. Also, as discussed in the introduction to “Construction-Period Impacts” above and in Section 2.4.5.3 of this Draft Supplemental EIR/EIS, to the extent that it is feasible and reasonable, utilities located in the proposed F-B LGA ROW would be relocated to outside of the ROW. This may result in temporary service interruptions (as discussed under Impact PU&E#1), but operational service will be restored and maintained. Pursuant to utility agreements negotiated between the Authority and individual utility owners, the Authority would work with utility owners during final engineering design and construction of the F-B LGA to relocate utilities or protect them in place.

To date, the Authority has entered into Joint Use Agreements (JUA) or Common Consent to Use Agreements (CCUA) with nine utilities in the Fresno to Bakersfield Section, two of which provide services in the F-B LGA (and May 2014 Project) resource study areas south of Poplar Avenue. The JUAs and CCUAs provide utility providers with assurance that any required and approved relocation of the utilities’ facilities will be pursuant to the facility owners’ standards or the Authority’s design criteria existing at the time of the execution of the applicable agreement. In the event of a difference between the facility owners’ standards and the Authority’s design criteria, the more stringent is to apply. In some cases, the design standards of the facility owner refer to a county standard or the American Association of State and Highway Transportation Officials, and the JUA or CCUA stipulate those standards. As an example of the necessary coordination between the Authority and the utility owner, if conflicts are identified during final design, overhead electrical lines that traverse the F-B LGA may be placed underground (depending on the voltage). Alternatively, they may be raised to provide necessary clearance, or relocated to avoid HSR facilities.

Following completion of the construction period, operation and maintenance of the F-B LGA would not include ongoing relocation or upgrade of existing utilities beyond what would be implemented during the construction period (as discussed under Impact PU&E#1). Routine inspection of utilities along the F-B LGA, and implementation of repairs and maintenance activities where necessary, would avoid the potential for significant impacts to occur as a result of project operation. Repair and maintenance of existing utilities would occur regardless of project implementation.

Section 3.6.5.3 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: pages 3.6-50 through 3.6-54) describes potential impacts of the Fresno to Bakersfield Section related to conflicts with existing utilities, including a high likelihood for potential conflicts with

ancillary utility infrastructure, specifically existing electrical substations. As noted in Section 3.6.2.3, CEQA significance thresholds specify that a significant impact could occur due to conflicts with a fixed facility such as an electrical substation. As described in Section 2.4.5.3 of this Draft Supplemental EIR/EIS and under Impact PU&E#1, the project would conflict with existing utility facilities that would require modifications (HV transmission towers) and/or relocation (water service lines). These conflicts would be addressed during project construction, such that further modifications or relocations would not be required during the operation and maintenance period.

As described under Impact PU&E#1, implementation of the F-B LGA would not require any immediate PG&E network upgrades. Also as described in Section 2.1.5 (Study Electrical Interconnections and Network Upgrades), project-related changes to electrical interconnection facilities required to meet the projected power demands of the HSR system (including the F-B LGA) would include:

- Minor movement of traction power supply stations, switching stations, and electrical tie line
- Expansion of the existing PG&E substation north of SR 178 near the intersection of 30th Street and Union Avenue
- Implementation of new utility switching stations and an HSR traction power supply station

As noted above and in Section 3.6.2.3, CEQA significance thresholds specify that a significant impact could occur due to conflicts with a fixed utility such as a substation. In order to avoid significant impacts associated with the described modifications, the Authority would use JUAs and CCUAs with utility providers to identify and resolve utility conflicts similar to the approach it has taken for HSR activities north of the F-B LGA's northern terminus (Poplar Avenue in Shafter). Based on this coordination, and the implementation of Avoidance and Minimization Measures including PUE-IAMM#1 (Minimization of Utility Interruption), provided in Section 3.6.5, the effects of the F-B LGA on existing utilities during operation and maintenance would be less than significant under CEQA.

Impact PU&E#7 – Reduced Access to Existing Utilities in the HSR Right-of-Way

As with the May 2014 Project, the F-B LGA ROW would be fenced and secured after construction, including after the relocation or in-place protection of any utilities located in or through the ROW. Further discussion of how utilities would be relocated or protected in-place is provided in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) (Impact PU&E#6 in Section 3.6.5.3), which states that implementation of standard engineering and utility access practices and the casing and maintenance access requirements of utilities located underneath or inside the HSR ROW would reduce access to existing utility lines.

As discussed, the Authority has entered into JUAs or CCUAs with utility providers in the Fresno to Bakersfield Section. These JUAs or CCUAs commit the Authority to provide sufficient access to ensure the safe and regular maintenance of facilities, including access roads, if required. This may include easement rights to maintain, operate, dredge, and spray canals in accordance with standard facility owners' practices, including access for heavy equipment trucks. In situations where existing canal or ditch access roads are blocked by the HSR ROW, the Authority has to design culverts with extra length to allow a maintenance vehicle to turn around at each side of the HSR embankment. Generally, these culverts will be extended to have 25 feet of clearance from the face of the headwall to the HSR ROW to allow construction of a 15-foot turnaround road, unless the facility owner has other standard specifications. The Authority has also committed to provide for the construction of a 15-foot turnaround for any other maintenance or access road that is blocked by the HSR ROW. The Authority would take a similar approach for the F-B LGA, thereby maintaining utility providers' access to facilities.

Based on the above discussion, and with implementation of these standard engineering and utility access practices, maintenance access will be provided to utilities located underneath HSR ROW. Potential impacts associated with reduced access to existing utility facilities would be less than significant under CEQA.

Impact PU&E#8 – Upgrade or Construction of Power Lines

As with the other parts of the HSR system, the F-B LGA would use an electrified line with traction power for electric vehicles. Electricity would be supplied and distributed by a 2x25 kV autotransformer power supply system and an overhead contact system (Authority 2009). As discussed in Section 2.4.5.3 of this Draft Supplemental EIR/EIS and under Impact PU&E#1 above, implementation of the F-B LGA would include modification to several sections of existing HV transmission line, specifically with tower height required to provide clearance for the F-B LGA alignment. Also as discussed under Impact PU&E#6, conflicts with existing utilities (including power lines) would be addressed during project construction.

California's electricity grid would power the proposed HSR system. Therefore, construction of the project would not include the construction of a separate power source. As discussed in Section 2.2.6 (page 2-12) of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), although it is not feasible to physically control the flow of electricity from particular sources, it would be feasible for the Authority to obtain the quantity of power required for the HSR system from 100 percent clean, renewable energy sources through a variety of mechanisms, such as paying a clean-energy premium for the electricity consumed. Operation of the project would not include additional or continued upgrade or construction of power lines (beyond the construction period), except where necessary for routine maintenance.

Although the project would not require construction of a new power source separate from California's existing electricity grid, certain infrastructure modifications would be required to ensure delivery of the electricity required for operation of the project. As discussed in Section 3.6.4.1 for the May 2014 Project, and as would occur for the F-B LGA, a 50 kV AC TES would be installed, and would interconnect into local utility networks at 115 kV or 230 kV, with approximately 30-mile intervals between the traction power substations. One traction power substation would occur on the F-B LGA alignment. This substation, located in Bakersfield and referred to in PG&E's (2016) Technical Study Report as "Site 13", is the same substation that would be implemented in Bakersfield under the May 2014 Project (as described above in Section 3.6.4.1).

As outlined above, the potential impact of operation and maintenance of the F-B LGA on power lines would be the same as described in the Fresno to Bakersfield Section Final EIR/EIS (Impact PU&E#7 in Section 3.6.5.3: page 3.6-54) (Authority and FRA 2014). Potential impacts would be less than significant under CEQA.

Impact PU&E#9 – Potential Conflicts with Electrical Facilities

As with the May 2014 Project, there would be a number of potential conflicts between existing electrical facilities and the proposed F-B LGA. The Authority is working with utility providers to identify utility conflicts, and will continue to coordinate through final engineering design and construction of the F-B LGA to relocate these transmission lines or protect them in place. On October 11, 2016, the Authority's Board of Directors approved a resolution to enter into an Engineering and Permits contract with PG&E to provide PG&E with the resources necessary to complete design, acquisition of permits, and facilities to provide service to the HSR system. As described above, PG&E's Technical Study Report (PG&E 2016) assessed traction power substation locations and system interconnection requirements along the HSR system, one of which would occur on the May 2014 Project alignment. In Bakersfield, the F-B LGA would implement the same traction power substation and interconnection features as would occur under the May 2014 Project. The Authority is working in coordination with PG&E to ensure that the interconnection site identified for the F-B LGA is feasible and that necessary contract agreements are in place. If the F-B LGA is approved, PG&E would implement the facility as described in its Technical Study Report (PG&E 2016).

The Authority would build the transmission line to the interconnection facility as described in Section 2.4.5.3, Utility Modifications, of this Draft Supplemental EIR/EIS. As discussed in Section 2.4.5.3 and under Impact PU&E#1, a number of HV transmission lines and supporting facilities would be upgraded or modified during the construction period in order to accommodate the

proposed HSR facilities while maintaining utility service. This includes the proposed interconnection site. In the event an electrical distribution line must be relocated during construction of the F-B LGA, the relocation would be done in coordination and cooperation with the utility owner so that the relocation would not result in prolonged disruption of services and would not result in the loss or reduction of access to public utility lines or pipes.

Operation and maintenance of the F-B LGA would not include any ongoing relocation or upgrade of existing electrical facilities beyond what would occur during the construction period (as discussed under Impact PU&E#1). Potential impacts would be the same as described in the Fresno to Bakersfield Section Final EIR/EIS (Impact PU&E#8 in Section 3.6.5.3: page 3.6-55) (Authority and FRA 2014). Effects associated with upgrade or construction of power lines would be less than significant under CEQA.

Impact PU&E#10 – Potential Conflicts with Natural Gas Lines (High Pressure)

As with the May 2014 Project, there would be a number of potential conflicts between existing natural gas lines (considered a high-risk utility) and the F-B LGA and associated station area. As discussed under “Construction-Period Impacts” above, the Authority would work with utility owners to place affected lines underground in a protective casing so that future maintenance of the line could be accomplished outside of the F-B LGA ROW. The project would not result in prolonged disruption of services and would not result in the loss of or reduced access to public utility pipes. As noted in Section 3.6.2.3, a significant impact could occur if the project would conflict with a fixed facility. The F-B LGA would protect or relocate natural gas pipelines that traverse the proposed alignment. Protecting in place or relocating the high-pressure natural gas pipeline resolves the conflict. Therefore, the effect would be less than significant under CEQA.

Impact PU&E#11 – Potential Conflicts with Petroleum and Fuel Pipelines

Figure 3.6-3 shows potential conflicts of the F-B LGA alignment with existing petroleum and fuel pipelines. Oil and gas wells are further assessed in Section 3.10, Hazardous Materials and Wastes (see Impacts HMW#3, Construction on or Near PEC Sites, HMW#5, Construction in Proximity to Landfills and Oil Well Sites, and HMW#8, Operation in Proximity to Landfills and Oil Well Sites). As with the May 2014 Project, there would be a number of potential high-risk conflicts between existing petroleum and fuel pipelines and the F-B LGA and associated facilities. As discussed under “Construction-Period Impacts” above, the Authority would work with pipeline owners to place affected lines underground in a protective casing so that future maintenance of the line could be accomplished outside the F-B LGA ROW.

As discussed in Section 3.9.5 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.9-33), unless existing oil and gas wells and ancillary/appurtenant facilities necessary to maintain oil field operations are identified and remediated inside the project footprint, they could be disrupted and have environmental consequences during construction. Discussion of oil and gas fields is further provided in Section 3.9.3.7, Geology, Soils, Seismicity, and Paleontological Resources, of this Draft Supplemental EIR/EIS. Therefore, construction contractors would use safe and explosion-proof equipment during construction in areas where explosion hazards exist, and would test for gases regularly.

The project would not result in prolonged disruption of services and would not result in the loss of or reduced access to public utility lines or pipes. As noted in Section 3.6.2.3, a significant impact could occur if the project would conflict with a fixed facility. The F-B LGA would protect or relocate petroleum and fuel pipelines that traverse the proposed alignment. Protecting in place or relocating the petroleum and fuel pipelines resolves the conflict. Therefore, the effect would be less than significant under CEQA.

Impact PU&E#12 – Potential Conflicts with Water Facilities

Potential conflicts with water facilities (considered a low-risk utility, as described in the Fresno to Bakersfield Section Final EIR/EIS [Authority and FRA 2014]) could occur through physical alterations to water supply facilities or through the introduction of water supply reliability concerns.

As with the May 2014 Project, there would be a number of potential low-risk utility conflicts associated with the proposed F-B LGA alignment and facilities, including water lines. As discussed in Section 3.6.5.3 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), the majority of water line crossings would occur in urban areas where the HSR would be on an elevated guideway, making it likely that disturbance will be avoided. The F-B LGA would not, however, be elevated through Shafter. This configuration could result in increased conflicts with existing water lines, compared to the elevated guideway configuration used in other portions of the alignment. Where conflicts would occur between the proposed alignment and existing water lines, the water lines would be relocated away from HSR facilities in order to ensure continued service. The Authority would work with the appropriate city public works departments to move affected lines and water facilities with minimal disruption to existing service.

In the rural portion of the F-B LGA, the project would cross a number of irrigation pipelines and canals. As is the case with the May 2014 Project, the Authority would work with irrigation districts and landowners to protect irrigation systems as they intersect the HSR. When relocating an irrigation facility is necessary, the Authority shall ensure that, where feasible, the new facility is operational prior to disconnecting the original facility to help alleviate the potential for service interruptions.

In the case of the F-B LGA, irrigation services would not experience prolonged disruption because of the need for relocation of or improvements to irrigation systems. As noted in Section 3.6.2.3, significant impacts could occur if the project would require construction of new water or wastewater treatment facilities or expansion of existing facilities, or new or expanded entitlements to supply water to the project. The protection in-place or relocation of water facilities along the project alignment would not require new or expanded resources or entitlements. Impacts would therefore be less than significant under CEQA.

An operational water supply would not be required along the rail alignment for the F-B LGA. Operational water would be required at the MOIF and the F Street Station. Operational water estimates for the F-B LGA are provided in Table 3.6-8.

Existing water uses along the F-B LGA are provided in Table 3.6-6. Comparison of estimates provided in Table 3.6-6 and Table 3.6-8 indicate that operation and maintenance of the F-B LGA would require substantially less water than would continuation of current land uses and associated water use factors (approximately 65 acre-feet per year for operation of the F-B LGA, versus approximately 3,626.41 acre-feet per year to support existing land uses along the alignment, including the north Shafter MOIF and the F Street Station).

Operation of the station in the F-B LGA would use water from the municipal systems of Bakersfield. The *City of Bakersfield 2010 Urban Water Management Plan* (City of Bakersfield 2014) indicates that sufficient water supplies are available or planned to meet anticipated water demands inside the Bakersfield study area over a 20-year projection period, under normal-year, single-dry-year, and multiple-dry-year conditions (City of Bakersfield 2014). The proposed F Street Station would not require or result in new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Table 3.6-6 indicates that operational water use at the MOIF would be up to approximately 6 acre-feet per year. As discussed in Appendix 3.6-B to the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), this water demand estimate is based on per capita water use data from a comparable facility operated by BART in Hayward, California, and considers water used for industrial operations and landscaping uses. The resulting water use factor is approximately 30 gallons per employee per day. It is anticipated that water service to the MOIF site would be provided by the Shafter-Wasco Irrigation District, shown on Figure 3.8-3 in Section 3.8, Hydrology and Water Resources, of this Draft Supplemental EIR/EIS. The Shafter-Wasco Irrigation District currently provides water supply to this area and, as shown in the comparison between Table 3.6-6 and Table 3.6-8, land uses at the MOIF site currently require 128.44 acre-feet per year, while operation of the proposed MOIF would require 6 acre-feet per year. Therefore the Shafter-Wasco Irrigation District would have sufficient capacity to meet these reduced water needs.

Table 3.6-8 Operational Water Demand Summary

Facility	Daily Employee and Passenger Use	Facility Feature	Facility Area	Use Factor (gal/day/1,000 sq ft)	Use Factor (gal/capita/day)	Estimated Daily Volume (gal/day)	Annual Water Use (acre-feet/year)
MOIF ¹	180 employees	–	–	–	30	5,400	6
MOIF Water Use, Based on Number of Employees						5,400	6
F Street Station ²	9,200 passengers (2035 estimate)	Station (Office)	5,000 sf	150	–	750	1
		Station (Concourse)	57,500 sf	20	–	1,150	1
		Parking Structure	4.5 acres	5	–	1,000	1
		Landscaping	2.5 acres	–	–	3,300	4
		–	–	–	5 gal/passenger	46,000	52
Station Water Use, Based on Station Area							7
Station Water Use, Based on Number of Passengers							52
TOTAL OPERATIONAL WATER USE							65

¹ Operational water use at the MOIF is estimated based on a per-capita rate of 30 gallons per day (the same rate assumed for the Heavy Maintenance Facility [HMF]/MOIF in the *Fresno to Bakersfield Section Final EIR/EIS*) based on water use data from a comparable facility operated by BART in Hayward, California. This is a conservative estimate because the per-capita rate used for the HMF/MOIF also accounted for train washing at the HMF, which would not occur at the MOIF (the May 2014 Project co-located the HMF and MOIF). In addition, it was further assumed that water use at the MOIF would occur 365 days per year, and overall water use was rounded up from 5.84 acre-feet per year to six acre-feet per year.

² Assumed that operational water use at the F Street Station would be the same as described for the Truxtun Avenue Station in the *Fresno to Bakersfield Section Final EIR/EIS*, as these two stations would be designed to accommodate the same number of passengers and employees.

gal = gallons
sf = square feet

As with the May 2014 Project, and as discussed in Section 3.6.5.3 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), based on the water-supply capacity and existing rates of water use along the F-B LGA, the overall impact of operational water requirements on water supply availability would be less than significant under CEQA.

Impact PU&E#13 – Wastewater Facilities – Conflicts and Capacity

The F-B LGA operations would generate wastewater at the F Street Station and the MOIF. The proposed F-B LGA would also traverse a number of existing wastewater pipelines.

As with the May 2014 Project, there would be a number of potential wastewater pipeline (considered a low-risk utility) conflicts that would occur along the F-B LGA. In areas where the F-B LGA route would be elevated, it is likely that disturbance to these pipelines would be avoided during final engineering design when the specific placement of columns is determined. There may, however, be some locations where it would be necessary to relocate wastewater pipelines. In this case, the Authority would work with the appropriate service provider to relocate affected lines away from HSR support columns and foundations and schedule relocations to minimize service disruptions. The Authority would work with utility owners to place affected pipelines underground in a protective casing so that future maintenance of the line could be accomplished outside the HSR ROW.

Operational wastewater generated at the F Street Station under the F-B LGA would be the same as under the May 2014 Project because it would accommodate the same number of daily passengers and employees. Table 3.6-17, Estimated Project Wastewater (Sewage) Generated for Each High-Speed Train Station, in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), indicates that approximately 25,300 gallons per day of wastewater (sewage)

would occur at the F Street Station. The discussion of this impact in the *Fresno to Bakersfield Section Final EIR/EIS* (Impact PU&E#12) determines that wastewater treatment capacity for Bakersfield exceeds existing average daily volume of treatment by approximately 10.5 million gallons per day. This indicates that sufficient wastewater treatment capacity is available to accommodate wastewater generated at the proposed F Street Station. As discussed in the *Fresno to Bakersfield Section Final EIR/EIS*, the population in this area is projected to grow over the next 20 years, and treatment capacity will need to be expanded to meet the demand of that growing population. The volume of wastewater generated at the proposed F Street Station would not, however, result in inadequate capacity to serve the project's anticipated demand in addition to the existing sewer service demand.

As noted, operational wastewater would also be generated at the MOIF. It is assumed that wastewater generation rates at the MOIF site would be comparable to those at the heavy maintenance facility (HMF) site(s), because the operation and maintenance activities at each type of site would be comparable, consisting of facility and infrastructure repair and cleaning. As discussed in Section 3.6.5.3 of the *Fresno to Bakersfield Section Final EIR/EIS* (Impact PU&E#13), operational activities at each HMF would produce approximately 5.7 million gallons of wastewater annually (or approximately 15,600 gallons per day). Where regional or municipal wastewater services are unavailable, the facilities would be served by an onsite wastewater treatment package plant that would process project-related wastewater. Treated wastewater from the package plant would be used for onsite irrigation. Sludge generated by the process would be removed onsite using aerobic digestion, a bacterial process occurring in the presence of oxygen. Under aerobic conditions, bacteria rapidly consume organic matter and convert it into carbon dioxide. These facilities are commonly used in rural regions of California to dispose of wastewater without causing impacts to surface water resources.

Based on projected usage and engineering practices for treating operational activities, potential impacts associated with wastewater facility conflicts and wastewater treatment capacity would be less than significant under CEQA.

Impact PU&E#14 – Storm Drain Facilities – Conflicts and Capacity

The proposed F-B LGA could result in impacts associated with storm drain facilities through physical conflicts with existing storm drain facilities, and/or through the introduction of new stormwater runoff in quantities or quality that overwhelm existing or planned storm drain facilities. As with the May 2014 Project, there would be a number of potential storm drain facilities conflicts along the F-B LGA. Potential impacts associated with relocating or protecting the facilities in place in the alignment are discussed under Impact PU&E#1, and substantial or significant impacts would not occur as a result of storm drain facility conflicts.

It is possible that implementation of the F-B LGA could result in increased stormwater runoff, where impervious surfaces such as unpaved fields are replaced with impermeable surfaces such as metal and concrete. The project would be designed to address stormwater volumes and flow requirements, to anticipate potential increases in runoff and plan for adequate conveyance capacity. The project would be in compliance with the *Waste Discharge Requirements for the County of Kern and the City of Bakersfield for Urban Storm Water Discharges*, National Pollution Discharge Elimination System (NPDES) Permit No. CA0085324, Order No. R5-2016-0040, issued June 23, 2016. Phase I MS4 permittees shall enroll under the region-wide permit as their current individual permits expire and Phase II MS4 permittees may choose to enroll.

During final design, an evaluation of each receiving stormwater system's capacity to accommodate project runoff would be conducted and, as necessary, onsite stormwater management measures such as detention or selected upgrades to the receiving system would be included in the design to provide adequate capacity. This would occur for the entire *Fresno to Bakersfield Project*, as discussed under Impact PU&E#13 in the *Fresno to Bakersfield Section Final EIR/EIS* (Authority and FRA 2014). Similarly, the F-B LGA would occur in compliance with the General Construction Stormwater Permit issued by the State Water Resources Control Board, requiring implementation of best management practices to address stormwater runoff.

In summary, and as discussed in Section 3.8, Hydrology and Water Resources, stormwater runoff could increase and collect as a result of the project, but project design and coordination with relevant agencies would ensure adequate conveyance capacity. Potential effects associated with storm drain facilities would be less than significant under CEQA.

Impact PU&E#15 – Waste Generation during Operation

As with the May 2014 Project, operation of the F-B LGA would generate solid waste, including passenger refuse disposal at the F Street Station and materials used for maintenance of proposed facilities. Because the F Street Station under the F-B LGA would be designed to accommodate the same number of passengers and employees as the Truxtun Avenue Station in the May 2014 Project, the amount of waste generation during operation would also be the same (approximately 1.3 tons per day). The recycling diversion factor estimates that 65 percent of waste is recycled and 35 percent is sent to the landfill after processing. The F-B LGA would therefore not conflict with the capacities of existing solid waste disposal facilities. No existing or proposed expansion areas for solid waste disposal would be affected by the F-B LGA.

Activities at the MOIF site, including administrative (office) work, packaging of materials and equipment used for maintenance of the HSR facilities, and incidental waste from employees, would generate solid waste such as paper, cardboard, plastics, and other materials similar to household waste. Waste generated at the MOIF would be comparable to waste generated at the HMF sites discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), and would equate to approximately 41,000 cubic yards of waste annually, or less than 0.2 percent of estimated remaining landfill capacity in the area. Existing landfill capacity will either be adequate or will increase along with other needs, and will expand sufficiently during the life of the project.

All nonhazardous solid waste generated as a result of the proposed F-B LGA would be disposed of in landfills operated by Kern County, primarily the Bena Sanitary Landfill or the Shafter-Wasco Sanitary Landfill. As discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014), the combined permitted daily disposal capacity of these two landfills is 5,388 tons/day. Bena Sanitary Landfill alone has a maximum permitted daily throughput of 4,500 tons per day and a remaining capacity of 33,000 cubic yards, with an estimated closure date of 2038. These available capacities indicate that effects associated with waste generation during operation would be less than significant under CEQA.

Impact PU&E#16 – Hazardous Waste Generation during Operation

As discussed in Section 3.10, Hazardous Materials and Wastes, routine maintenance of the F-B LGA would produce small quantities of hazardous waste, and operational activities would also involve the use, storage, and disposal of hazardous materials and petroleum products. Potential impacts associated with hazardous waste generation and disposal would be comparable to that of the entire May 2014 Project, as discussed under Impact PU&E#15 in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014). Hazardous wastes generated as a result of the F-B LGA would be handled, stored, and disposed of in accordance with applicable requirements. A certified hazardous waste collection company would deliver the waste to an authorized hazardous waste management facility for recycling or disposal. Hazardous wastes could be disposed of at permitted landfills that have sufficient capacity. Therefore, the impacts would be less than significant under CEQA.

Impact PU&E#17 – Energy Consumption – Project Period Impacts

The assessment of energy consumption associated with the May 2014 Project was conducted on a statewide basis to reflect the nature of energy production and transmission in California, and to indicate fully the statewide extent of potential energy-saving effects associated with reductions in airline travel and VMT that would occur during operation the HSR system.

The electric vehicles of the HSR system would use an electrified line with traction power connected to existing PG&E substations. For determining overall energy consumption, the analysis assumed use of a Siemens ICE-3 Velaro vehicle operating as two eight-car trainsets and

traveling 43.1 million annual train miles by 2035 (Fresno to Bakersfield Section Final EIR/EIS [Authority and FRA 2014]: page 3.6-72). The analysis conservatively includes the use of regenerative braking as well as transmission losses. Electrical demand for the propulsion and operation of the HSR system at terminal stations, storage depots, and maintenance facilities is conservatively estimated to be 16,388,500 MMBtu annually (44,900 MMBtu per day) under the 50 percent fare scenario, and 10,950,000 MMBtu annually (30,000 MMBtu per day) under the 83 percent fare scenario (Table 3.6-18, page 3.6-73 of the Fresno to Bakersfield Section Final EIR/EIS) (one MMBtu is equivalent to approximately 0.29 MWh). This energy estimate utilized current conversion factors, ridership forecasts, trainsets, and VMTs. For the overall system, this is an increase in electric energy consumption of approximately 28,404 MMBtu per day, or less than 1.5 percent of statewide consumption under the 50 percent fare scenario and less than 1 percent of statewide consumption under the 83 percent fare scenario.

Appendix 3.6-A, Existing Plus Project Conditions Energy Analysis, and Appendix 3.6-C, Energy Analysis Memorandum, of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014) present project-period analysis of energy consumption impacts associated with the May 2014 Project. As an alternative to a portion of the Fresno to Bakersfield Section of the HSR system, the F-B LGA would contribute to energy-related impacts as discussed in the Fresno to Bakersfield Section Final EIR/EIS, including Appendices 3.6-A and 3.6-C. Potential project-period impacts associated with energy consumption could occur as a result of peak electricity demand and/or overall operational-related energy consumption.

Peak Electricity Demand

As with the overall HSR system and the May 2014 Project, the F-B LGA would increase electricity demand in the area. Because of the anticipated times of peak rail travel, impacts on electricity generation and transmission facilities would be particularly focused on peak electricity demand periods (4:00 p.m. to 6:00 p.m.). According to the Statewide Program EIR/EIS (Authority and FRA 2005), the HSR would increase peak electricity demand on the state's generation and transmission infrastructure by an estimated 480 MW in 2020. Based on the assumption that this peak demand would be evenly spread throughout the HSR system, the F-B LGA portion of rail that extends from Shafter to Bakersfield would require approximately 15.9 MW of additional peak capacity from existing uses. This is extrapolated from the 78 MW of additional peak capacity that would be required under the May 2014 Project, as discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.6-77).

Also as discussed in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.6-77), summer electricity reserves were estimated (for 2010) to be between 27,708 MW for 1-in-2 summer temperatures and 18,472 MW for 1-in-10 summer temperatures. The projected peak demand of the HSR system is not anticipated to exceed these existing reserve amounts. The project's impact on peak electricity demand would be less than significant under CEQA.

Overall Energy Consumption from Operations

Electricity supplies for the year 2035 cannot be predicted at the time of preparation of this Draft Supplemental EIR/EIS, given the planning period available and the known demand from the project. However, energy providers have sufficient information to include the HSR system in their demand forecasts. Additionally, the HSR system would result in an overall net benefit in energy consumption. As described in the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: page 3.6-77), HSR project buildings would conform to U.S. Green Building Council Leadership in Energy and Environmental Design rating standards for environmentally sustainable new construction. HSR facilities, including passenger stations and the MOIF, would be Leadership in Energy and Environmental Design-certified at minimum level of Silver, and would be required to meet or exceed energy-efficiency targets with the goal of zero net energy use for facilities. Achieving the Authority's policy goal of using up to 100 percent renewable energy sources for the HSR system would result in a total estimated reduction in fossil fuel energy resources for the HSR system of up to 12.7 million barrels of oil annually by 2030. Given the net benefit of the HSR system on the overall energy demand (even if the 100 percent renewable policy is not fully successful), operational energy consumption effects would have a less than significant impact under CEQA.

3.6.5 Avoidance and Minimization Measures

All of the Avoidance and Minimization Measures (referred to as project design features in Section 3.6.6 of the Fresno to Bakersfield Section Final EIR/EIS) are applicable to the F-B LGA. The applicable list is provided in Technical Appendix 2-G Mitigation Monitoring and Enforcement Plan. Technical Appendix 2-H describes how implementation of these four measures would reduce adverse effects on public utilities and energy. The following Avoidance and Minimization Measure would be applicable to the May 2014 Project as well as the F-B LGA.

PUE-IAMM#1: Minimization of Utility Interruption: This measure requires that when relocating an irrigation facility is necessary, if feasible the Contractor will provide a new operational facility prior to disconnecting the original facility where feasible. Irrigation facility relocation preferences are included in the design-build contract and reduce unnecessary impacts to continued operation of irrigation facilities.

This obligation reduces impacts to public utility interruptions by coordinating planned interruptions providing utility users an opportunity to plan appropriately for the service interruption. Prior to construction in areas where utility service interruptions are unavoidable, the contractor will notify the public through a combination of media in that jurisdiction (e.g., phone, email, mail, newspaper notices) and the affected service providers of the planned outage. The notification will specify the estimated duration of the planned outage and would be published no less than seven days prior to the outage. Construction will be coordinated to avoid interruptions of utility service to hospitals and other critical users. The contractor will submit the public communication plan to the Authority in advance of the work for verification that appropriate notification was provided.

This measure reduces impacts to public utility interruptions by coordinating planned interruptions providing utility providers an opportunity to plan appropriately for the service interruption. Prior to construction the contractor shall prepare a technical memorandum documenting how construction activities will be coordinated with service providers to minimize or avoid interruptions, including upgrades of existing power lines to connect the HSR system to existing utility substations.

In addition, Section 3.6.6 of the Fresno to Bakersfield Section Final EIR/EIS (Authority and FRA 2014: pages 3.6-77 and 3.6-78) states that the avoidance and minimization measures for stormwater management identified in Section 3.8, Hydrology and Water Resources, are also applicable to public utilities and energy, and would be implemented to minimize or avoid potentially adverse impacts to stormwater conveyance facilities. As discussed in the Authority's (2011) *Technical Memorandum, Section 2.6.5 Hydraulics and Hydrology Guidelines*, during the detailed design phase for the project, the capacity of all receiving stormwater systems that would be affected by runoff from the project vicinity will be evaluated to ensure that existing systems will accommodate project runoff for the design-level storm event. Onsite stormwater management facilities will be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development techniques will be used to detain runoff onsite and to reduce offsite runoff. Constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, will be used where appropriate. Portions of the MOIF site will be used for onsite infiltration of runoff, if feasible, or for stormwater detention if not feasible. Vegetated setbacks from streams will be used.

3.6.6 Mitigation Measures

3.6.6.1 *Mitigation Measures Identified in the Fresno to Bakersfield Section Final EIR/EIS*

One mitigation measure for public utilities and energy was approved under the *Fresno to Bakersfield Section Mitigation and Monitoring Enforcement Plan* (Authority and FRA 2014: pages 1–8): Mitigation Measure PU&E-MM#1, Reconfigure or Relocate Substations and/or Substation

Components. This measure is not applicable to the May 2014 Project because it addresses site-specific substation components that are not located in the May 2014 Project study area.

3.6.6.2 *Mitigation Measures Specific to the Fresno to Bakersfield Locally Generated Alternative*

No additional mitigation measures are required to address public utilities and energy impacts resulting specifically from the F-B LGA.

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