

Throughout this Application, all references to Federal Power, Federal Power Avenal, LLC, and Federal Power Avenal refer to Avenal Power Center, LLC.

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6.11 TRAFFIC AND TRANSPORTATION

This section presents an evaluation of the existing traffic and transportation systems in the Site region and the potential effects of the Project on these systems. The Site is located in a rural, sparsely populated area that has nearby rail access. It is also close to Interstate 5 and is otherwise surrounded by agriculture and open space. Roads and highways near the Site generally have light to moderate traffic loads much of the day and night. The availability of rail access together with the nearby interstate provides convenient access to the Site for industrial equipment delivered from distant locations.

The only potential for the Project to materially affect traffic and transportation systems in the Site area would come from Project construction. The analysis contained in this section demonstrates that these effects would be less than significant. Peak construction activities, where up to 550 workers will commute on local roads to the Site on a daily basis, would only last for approximately 2 months, and the average number of construction workers would be only 320 workers over the 27-month construction period. Further, the construction employees would operate in two shifts, with Shift 1 starting at 6:30 a.m. and ending at 3:00 p.m. and Shift 2 starting at 7:30 a.m. and ending at 4:00 p.m.

Project construction will also involve delivery truck traffic as equipment and materials are brought to the Site and waste and recyclable materials are hauled from the site. An average of less than 10 truck trips per day will arrive and depart the Site during the 27-month construction period. Construction truck traffic is projected to be spread throughout the work day. Addition of this number of trucks to the existing traffic on local roads will not create adverse levels of service (as defined by local transportation authorities) on local roads and highways. In addition, heavy and oversized deliveries will occur under appropriate oversize permits. These permits are granted after timing of delivery and routes are selected that would minimize impacts on local traffic and transportation systems. For all of these reasons, Project construction effects on traffic and transportation systems will not be significant.

Once Project construction is completed, permanent Project operational activities will have negligible effects on local roads and highways. The largest routine operating shift will consist of approximately 17 employees. Less than five truck trips will be required each day for deliveries and for routine hauling of waste and recyclable materials from the Site. This traffic volume is small and will not be noticeable on local roads. As a result, long-term effects to traffic and transportation systems in the vicinity of the Site will be less than significant.

The traffic analysis for the Project was prepared by TPG Consulting, Inc. The analysis is summarized in this section. Additional summary tables are contained in Appendix 6.11-1. Due to the volume of worksheet analyses that support the summary information, the worksheets are not reproduced in Appendix 6.11-1. Instead, the worksheets that support this traffic analysis are available upon request on compact disk or printout. All level of service (LOS) analysis was calculated using the *2000 Highway Capacity Manual (HCM 2000)* methodologies contained in the *2000 Highway Capacity Software (HCS+)*. LOS for the study locations were calculated using the following modules of the *HCS+*:

- Two-lane Highway
- Freeway
- Ramp Merge/Diverge
- Unsignalized Intersection

6.11.1 EXISTING CONDITIONS

The following is a description of existing traffic and transportation facilities in the Project region including roads, highways, freeways, rail lines, bike trails, airports, bus routes, pipelines and canals. Regional traffic and transportation facilities are discussed in Section 6.11.1.1. Local traffic and transportation facilities are described in Section 6.11.1.2. New traffic and transportation facilities planned in the Project area by either the City of Avenal, Kings County or Caltrans are discussed in Section 6.11.1.3.

6.11.1.1 Regional Setting

Figure 6.11-1 shows the regional traffic and transportation facilities. The Site is located in the southwest portion of the San Joaquin Valley, approximately 2 miles east of Interstate 5 just south of Avenal Cutoff Road. This region is rural and sparsely populated, with agriculture serving as the primary land use. Two small communities, the City of Avenal and Kettleman City, are located about 6 miles southwest and 8 miles southeast, respectively. Figure 6.11-2 details the existing road system, bus routes, canals and major pipelines near the Project. Avenal Cutoff Road from SR 198 to SR 269 is designated as an existing bikeway. Nevada Avenue from Avenal Cutoff Road to SR 41, and SR 269 from Avenal Cutoff Road to SR 33 are planned bikeways.

6.11.1.1.1 Roads and Highways

The major highways and roads in the Project vicinity are shown in Figure 6.11-1. Interstate 5 is located approximately 2 miles west of the Site. Interstate 5 runs north and south between San Diego County and the Oregon state line. SR 198, located approximately 11 miles north of the Site, runs from SR 101 in Monterey County to the Sierra Nevada Range. SR 41 passes approximately 6 miles to the southeast. This route runs from SR 1 in San Luis Obispo County to the City of Fresno and beyond. Characteristics of these and other relevant roads and highways in the area are presented in the local traffic and transportation facilities discussion in Section 6.11.1.2.

6.11.1.1.2 Rail Service

The Burlington Northern and Santa Fe (BNSF) Railroad operates a spur located in Corcoran. This spur is connected to BNSF's main line that runs north/south through the central portion of California. The San Joaquin Valley Railroad operates on the leased Union Pacific line that runs east/west between Huron and Exeter. This Union Pacific line connects to the BNSF main line in Hanford and also connects to the Union Pacific main line in Goshen that runs along SR 99.

6.11.1.1.3 Air Service

The public and private airports located within approximately 30 miles of the Site are shown in Figure 6.11-1. The nearest regional airport is Fresno-Yosemite International Airport, located approximately 57 miles northeast of the Site. Municipal airports in the area include Coalinga Municipal, located approximately 13 miles to the northwest, Hanford Municipal, approximately 28 miles to the northeast, and Visalia Municipal, approximately 40 miles east of the Site. The Avenal Airport, which is privately owned but open to public use, is more than 7 miles south of the Site and on the opposite side of the Kettleman Hills. Harris Ranch, another privately owned airport open to public use, is approximately 15 miles northwest of the Site. The Lemoore Naval Air Station (NAS), one of four Navy master jet bases in the United States, is located approximately 15 miles northeast of the Site. There are no existing or planned airports within 20,000 feet of the Project Site or linear facilities, and there are no heliports within 5,000 feet of the Site or linear facilities (FAA, 2007). The USGS 7.5 minute quadrangle map for the Site area used as a base map for a number of figures in this AFC shows a "Landing Strip" just west of the Site on the north side of Avenal Cutoff Road. This landing strip is no longer present as

confirmed by FAA records search (FAA, 2007), field reconnaissance, and through an interview with the land owner (John Kochergen of Kochergen Farms).

6.11.1.1.4 Public Transit

As shown in Figure 6.11-1 regional public transit does not pass through the Site vicinity. There are no public transit facilities in the vicinity of the Site.

6.11.1.1.5 Waterways

There are no vehicle-use waterways in the Project area.

6.11.1.1.6 Other Transportation Facilities

A number of pipeline systems occur in the region. The SWP has an irrigation water distribution system that distributes water to the farmlands in the region and the joint CVP/SWP/San Luis Canal (California Aqueduct) that is adjacent to the Site. Several oil and gas pipelines, including two PG&E natural gas pipelines, occur in the area. The PG&E Kettleman compressor station compresses gas for transport along these lines. The Project will be connected to the compressor station for its gas supply. The City of Avenal operates a water pipeline adjacent to Avenal Cutoff Road that delivers water from the city water treatment facility located adjacent to the Site to the residential and business districts of Avenal and the Avenal State Prison, all located on the opposite side of the Kettleman Hills to the southwest.

6.11.1.2 Local Setting

The roads and highways in the Project area are shown in Figure 6.11-2. As shown, the roadway system includes Interstate 5, Avenal Cutoff Road, Plymouth Avenue and Lassen Avenue (SR 269). The classification and design capacities for these roads and highways are listed in Table 6.11-1.

TABLE 6.11-1

ROADS AND HIGHWAYS IN THE VICINITY OF THE PROJECT

STREET	CLASSIFICATION	NO. OF LANES	DAILY DESIGN CAPACITY ⁽¹⁾	POSTED SPEED LIMIT (mph)	WEIGHT & LOAD LIMITATIONS
Interstate 5	Interstate/Freeway	4	80,000 ⁽²⁾	70	Legal load
SR 198	Freeway/Expressway	2-4	80,000 ⁽²⁾	55-65	Legal load
SR 41	Rural Highway/Principle Arterial/Expressway/Freeway	4	80,000 ⁽²⁾	55-65	Legal load
SR 269	Arterial/Rural Highway	2	12,000 ⁽²⁾	55	Legal load
Avenal Cutoff Road	Arterial	2	12,000	55	Legal load
Jayne/Nevada Avenue	Collector	2	18,000	55	Legal load
25 th Avenue	Local	2	18,000	55	Legal load

(1) Daily design capacity interpolated from the City of Avenal General Plan Circulation Element.

(2) Capacity shown was interpolated from the City of Avenal General Plan Circulation Element. Caltrans has jurisdiction over the roadway. Caltrans measures design capacity using peak hour capacity calculated using the methodologies per the 2000 Highway Capacity Manual.

Table 6.11-2 shows average daily and peak hour traffic counts, and percentages of passenger vehicles, buses and heavy vehicles (trucks) for key road segments in the vicinity of the Site.

TABLE 6.11-2

AVERAGE DAILY TRAFFIC (ADT) VOLUMES
ON THE EXISTING ROAD SYSTEM

STREET/SEGMENT	AVERAGEDAILY TRAFFIC	PEAK HOUR TRAFFIC	PERCENT OF DAILY TRAFFIC		
			Passenger Vehicles (Percent)	Buses (Percent)	Heavy Vehicles (Percent)
Interstate 5	34,500	5,600	70	---	30
SR 198	18,500	2,100	92	---	8
SR 41	14,200	1,600	87	---	13
SR 269	3,984	349	72.57	1.10	26.33
Avenal Cutoff Road	5,031	430	83.92	0.36	15.72
Jayne / Nevada Avenue	2,519	303	76.57	---	23.43
25 th Avenue	200	18	75	---	25

Source: Annual average daily traffic volumes, peak hour and percentages are shown for Interstate 5, SR 198, and SR 41, and were taken from the Caltrans 2006 *Traffic Volumes on California State Highways* and the Caltrans 2005 *Annual Average Daily Truck Traffic on the California State Highway System*. Average daily traffic volumes, peak hour and percentages for the remaining segments are based on field data. Data for SR 269, Avenal Cutoff Road, and Jayne/Nevada Avenue taken from daily classification counts. Data for 25th Avenue was taken from peak hour intersection counts.

Trucks are allowed on all State Routes, Kings County highways and roads, and City of Avenal roads in the vicinity of the Project. Based on field observations of the road segments, intersections, and ramps being analyzed for this Project, it was determined that one location contains geometric constraints that tend to increase delay of certain traffic movements. For eastbound semi truck and trailer traffic on Jayne turning southwest on Avenal Cutoff Road, trucks must traverse over the centerline of Avenal Cutoff Road to complete their turning movements. This potentially requires additional delay until a sufficient gap in traffic on Avenal Cutoff Road occurs. Provided that drivers are cautious and careful, this condition will not adversely affect public safety. (TPG Consulting, Inc., 2001).

Traffic counts on key freeway and highway road segments, intersections and off-ramps in the Site area were performed for the Project in August 2007. Peak traffic hours for these study locations vary slightly, but generally occur between 5:00 a.m. to 7:00 a.m., and 4:00 p.m. to 6:00 p.m. The existing weekday LOS for the study locations during the analysis peak time periods are shown in Table 6.11-3. The existing weekday LOS peak hour times periods shown include the Construction Shift 1 (5:00 – 6:00 a.m. and 2:30 – 3:30 p.m.), Construction Shift 2 (6:00 – 7:00 a.m. and 3:30 – 4:30 p.m.), and Operation Shift (7:00 – 8:00 a.m. and 5:00 – 6:00 p.m.).

Table 6.11-3 also shows the projections for LOS for the freeway and highway road segments in the Project area for 2011 and 2012. The projections at these locations are provided to characterize the period when peak Project construction is scheduled (2011) and also the period when the Project is scheduled to begin commercial operation (2012). To be conservative, the traffic analysis assumes a 1.5 to 3.5 percent per year growth factor for traffic volumes on all road segments, ramps and intersections shown in Table 6.11-3. These growth factors are derived from the Kings County Association of Governments (KCAG) County Traffic Model.

6.11.1.3 Planned Transportation Facilities

There are no known major new transportation facilities planned in the area of the Site. As shown in Figure 6.11-2, Avenal Cutoff Road is designated as a bikeway, and SR 269 is a planned bikeway.

6.11.2 IMPACTS

This subsection presents the results of the analysis of potential Project impacts to traffic and transportation systems during both construction and operations. The Project's affects on traffic and transportation systems will be less than significant, largely due to the existing light to moderate traffic on most roads and highways in the Site vicinity and, for the operations phase of the Project, due to the low numbers of Project-related trips.

Once construction is completed, the largest routine Project operations shift will consist of approximately 17 employees with limited truck traffic (e.g., less than five delivery trucks per day, including material deliveries, UPS, waste hauling, etc.). This relatively small operations staff will generate very little traffic and have only a negligible long-term effect on levels of service for local traffic and transportation systems.

TABLE 6.11-3
EXISTING AND PROJECTED LEVELS OF SERVICE
WITHOUT PROJECT WORKERS

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	OPERATION NO PROJECT (2012)
FREEWAY SEGMENT	LOS AM ¹ /AM ² /AM ³ /PM ¹ /PM ² /PM ³	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ³ /PM ³
SR 41 north of SR 198			
• Northbound	A/A/A/A/A/A	A/A/A/A	A/A
• Southbound	A/A/A/A/A/A	A/A/A/A	A/A
SR 198 east of SR 41			
• Eastbound	A/A/A/A/B/A	A/A/A/B	A/B
• Westbound	A/A/A/A/A/A	A/A/A/A	A/A
SR 198 between Avenal Cutoff Road and SR 41 ¹			
• Eastbound	A/A/A/A/B/A	A/A/A/B	A/A
• Westbound	A/B/A/A/A/A	A/B/A/A	B/A
I-5 north of SR 269			
• Northbound	A/A/A/A/A/A	A/A/B/A	A/A
• Southbound	A/A/A/A/A/A	A/A/A/B	A/A

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	OPERATION NO PROJECT (2012)
I-5 south of SR 269			
• Northbound	A/A/A/A/A	A/A/A/A	A/A
• Southbound	A/A/A/A/A	A/A/A/B	A/A
ROADWAY SEGMENT	LOS AM1/AM2/AM3/PM1/PM2/PM3	LOS AM1/AM2/PM1/PM2	LOS AM3/PM3
Avenal Cutoff Road between Project Driveway and SR 198	C/C/C/C/C	C/C/C/C	C/C
SR 269 north of I-5	B/B/B/B/B	B/B/B/B	B/B
SR 269 south of I-5	C/C/C/C/C	C/C/C/C	C/C
INTERSECTION	LOS AM¹/AM²/AM³/PM¹/PM²/PM³	LOS AM¹/AM²/PM¹/PM²	LOS AM³/PM³
I-5 SB Ramps at SR 269			
• SB Left-Through	A/A/A/A/A	n/a	n/a
• EB Approach	A/A/A/A/A	n/a	n/a
I-5 NB Ramps at SR 269			
• NB Left-Through	A/A/A/A/A	n/a	n/a
• WB Approach	A/A/A/A/A	n/a	n/a
Avenal Cutoff Road at SR 269			
• NB Left	A/A/A/A/A	n/a	n/a
• SB Left	A/A/A/A/A	n/a	n/a
• WB Approach	B/B/B/B/B	n/a	n/a
• EB Approach	B/B/B/B/B	n/a	n/a
Jayne Avenue at SR 269	A/A/A/A/A	n/a	n/a
Jayne Avenue at Avenal Cutoff Road			
• NB Approach	A/A/A/A/A	n/a	n/a
• SB Approach	A/A/A/A/A	n/a	n/a
• WB Approach	B/B/B/B/B	n/a	n/a
• EB Approach	B/B/C/B/B	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	OPERATION NO PROJECT (2012)
SR 198 EB Ramps at Avenal Cutoff Road			
• NB Left	A/A/A/A/A	A/A/A/B	n/a
• SB Left	A/A/A/A/A	A/A/A/A	n/a
• WB Approach	A/B/B/C/C/C	A/B/C/C	n/a
• EB Approach	B/B/B/C/D/C	B/B/D/D	n/a
SR 198 WB Ramps at Avenal Cutoff Road			
• NB Left-Through	A/A/A/A/A	n/a	n/a
• WB Approach	B/B/B/A/B/B	n/a	n/a
SR 198 WB Ramps at NB SR 41			
• NB Left	A/A/A/A/A	n/a	n/a
• WB Approach	B/B/B/C/C/C	n/a	n/a
SR 198 WB Ramps at SB SR 41			
• WB Approach	B/B/B/B/B/B	n/a	n/a
SR 198 EB On-Ramp at NB SR 41			
• EB Approach	B/B/B/C/C/C	n/a	n/a
SR 198 at 25 th Avenue			
• WB Left	A/A/A/A/A	n/a	n/a
• NB Approach	A/A/A/A/A	n/a	n/a
25th Avenue at Avenal Cutoff Road			
• NB Left-Through	A/A/A/A/A	n/a	n/a
• EB Approach	B/B/B/A/A/A	n/a	n/a
RAMP	LOS AM ¹ /AM ² /AM ³ /PM ¹ /PM ² /PM ³	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ³ /PM ³
I-5 SB Off-Ramp to SR 269			
• Upstream	A/A/A/B/B/B	n/a	n/a
• Downstream	A/A/A/B/B/A	n/a	n/a
I-5 SB On-Ramp from SR 269			
• Upstream	A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	OPERATION NO PROJECT (2012)
I-5 NB Off-Ramp to SR 269			
• Upstream	A/A/A/B/B/B	n/a	n/a
• Downstream	A/A/A/B/B/A	n/a	n/a
I-5 NB On-Ramp from SR 269			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 198 WB Off- Ramp to Avenal Cutoff Road			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 198 WB On- Ramp from Avenal Cutoff Road			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 198 EB Off- Ramp to Avenal Cutoff Road			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 198 EB On-Ramp from Avenal Cutoff Road			
• Upstream	A/A/A/B/B/B	n/a	n/a
• Downstream	A/A/A/B/B/B	n/a	n/a
SR 198 WB Off- Ramp to SR 41			
• Upstream	A/B/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 198 WB On- Ramp from SR 41			
• Upstream	A/B/B/A/A/A	n/a	n/a
• Downstream	B/B/B/A/A/A	n/a	n/a
SR 198 EB Off- Ramp to SR 41			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	OPERATION NO PROJECT (2012)
SR 198 EB On-Ramp from SR 41			
• Upstream	A/A/A/B/B/A	n/a	n/a
• Downstream	A/A/A/B/B/A	n/a	n/a
SR 41 NB Off-Ramp to EB SR 198			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 41 NB Loop On- Ramp from EB SR 198			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/B/A/A	n/a	n/a
SR 41 SB On-Ramp from EB SR 198			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 41 SB Off-Ramp to WB SR 198			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a
SR 41 NB On-Ramp from WB SR 198			
• Upstream	A/A/A/A/A/A	n/a	n/a
• Downstream	A/A/A/A/A/A	n/a	n/a

¹ = Construction Shift 1 Study Period

² = Construction Shift 2 Study Period

³ = Operation Study Period

n/a = Not analyzed because traffic congestion is not expected due to low existing traffic flows and existing LOS substantially superior to recommended LOS minimum threshold levels

SR = State Route

I = Interstate

Density = pc/mi/ln

v/c = volume to capacity ratio

6.11.2.1 Significance Criteria

Significance criteria were determined based on CEQA Guidelines, Appendix G, Environmental Checklist Form, and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the Project:

- Causes an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads or congestion at intersections).
- Exceeds, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment).
- Results in inadequate emergency access.
- Results in inadequate parking capacity.
- Conflicts with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

In addition, the following LOS requirements are recommended by the City of Avenal, Kings County, Fresno County and Caltrans for roads under their jurisdiction.

LOCAL RECOMMENDED LOS REQUIREMENTS

SOURCE	LOS REQUIREMENT
City of Avenal General Plan	Maintain a roadway LOS C or better on local streets and Minor Collectors, and a LOS D or better on Collector and Arterial streets.
Kings County General Plan	Minimum LOS for intersections is D. I-5 and SR 198 in Kings County designated as oversize truck routes.
Fresno County General Plan	Strive to meet LOS D on urban roadways and LOS C on all other roadways.
Caltrans	Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State Highway facilities.

6.11.2.2 Construction Impacts

6.11.2.2.1 Construction Worker Traffic

The Project construction workers will operate in two shifts each day in order to reduce impacts to the local roadways. Shift 1 will operate from 6:30 a.m. to 3:00 p.m. and Shift 2 will operate from 7:30 a.m. to 4:00 p.m. Project construction worker traffic peaks are projected to occur twice each day (for each shift): once in the morning as construction workers travel to the Site; and once again in the mid to late afternoon as the construction workers depart the Site at the end of the construction shift. This cycle would be repeated Monday through Friday during the 27-month Project construction period. Occasional Saturday work shifts may occur to make up for delays in the construction schedule. Analysis of Saturday peak time periods was not performed since the weekend traffic is generally lower than the weekday peak time periods during the construction shift travel times and since Saturday work is not expected to routinely occur.

Figure 2.3-13 in Section 2.0, Project Description and Engineering, shows monthly manpower loading for the 27-month construction phase of the Project. As shown, Project manpower rises to a peak of 550 construction workers during months 19 and 20. The average monthly manpower level over the 27-month construction period is 320 construction workers. To analyze maximum potential impacts for the Project, the maximum construction manpower month, with 550 workers, was used. Traffic loadings are projected to occur from 5:00 a.m. to 6:00 a.m. for Shift 1 and 6:00 a.m. to 7:00 a.m. for Shift 2. Construction workers often arrive early for morning shifts, so traffic counts from a slightly earlier time frame than the 6:30 a.m. or 7:30 a.m. shift start time are used. Based on existing counts, the Shift 2 6:00 a.m. to 7:00 a.m. travel time period generally experiences higher volumes at the study locations than the Shift 1 5:00 a.m. to 6:00 a.m. travel time period. Therefore, to provide a worst case assessment, it was assumed that 45%, or 247, of the maximum 550 construction workers would travel to the Site between 5:00 a.m. and 6:00 a.m. and would depart from the Site between 3:00 p.m. and 3:30 p.m. with the remaining 55%, or 303, of the maximum 550 construction workers traveling to the Site between 6:00 a.m. and 7:00 a.m. and departing from the Site between 4:00 p.m. to 4:30 p.m.

No special designated employee access routes have been identified for this Project. Instead, the commute routes and quantities of workers using these routes were estimated taking into account the location of union craft workers, population centers where workers would most likely reside and the distances to those population centers. The routes that the construction workers are expected to use commuting to and from the Site, and the percentages of workers using each route, are shown in Figure 6.11-3.

Additional basis for the Project's construction work traffic analysis are as follows:

- It is estimated that 15 percent of the workers will carpool. The rest will drive a separate vehicle to and from the construction site.
- Except for special circumstances, minimal offsite travel will occur during the work day.
- Regular construction work schedule includes a half-hour lunch period which minimizes opportunities for offsite trips during the work day.

Table 6.11-4A shows the existing and "with Project" a.m. and p.m. peak hour (by shift) LOS for the study locations in the Project area. As described above, during peak manpower loading the daily construction work shifts will be from 6:30 a.m. to 3:00 p.m. (Shift 1) and 7:30 a.m. to 4:00 p.m. (Shift 2). As shown in Table 6.11-4A, the Avenal Cutoff Road at the SR 198 EB ramps intersection is currently operating below the recommended LOS standard in the Shift 2 PM analysis time period. The intersection is also projected to operate below the recommended LOS standard in the Shift 1 PM analysis time period in the 2011 No Project scenario. Without corrective measures, Project construction trips would increase the delay at this intersection for both time periods. The intersection does not meet the peak hour volume signal warrant (California MUTCD Warrant 3) due to low minor street (SR 198 EB off-ramp/Jackson Avenue) volumes. The cause of the delays is north-south traffic on Avenal Cutoff Road, which is heavy enough so as not to provide sufficient gaps for the minor street traffic to cross/enter the intersection. Neither the WB nor the EB approaches have more than 31 peak hour volumes for any of the study time periods or scenarios, so few vehicles are being delayed. Project construction inbound traffic and outbound traffic for this worst case assessment is not projected to reduce LOS below recommended levels at any other location.

While few vehicles would be delayed, Federal Power will mitigate the projected traffic delay at the EB and WB approaches for the Project construction period. Mitigation will be accomplished by using a traffic monitor at this intersection for the period of time during each construction day when Project workers leaving the Site are expected to pass through. This measure will be implemented in consultation with Caltrans and the California Highway Patrol. An off-duty traffic officer will be stationed at this intersection to direct traffic such that Project construction workers leaving the Site do not reduce the LOS. With this mitigation, and considering the low minor street volumes, this impact will be less than significant.

Minor construction activities will occur in connection with installation of a natural gas pipeline under a portion of Avenal Cutoff Road and Plymouth Road that will provide fuel to the Project

once it is operational. The minor construction activities will be short-term and only involve the opening of a narrow trench in the middle of short stretches of road at a time for pipe installation. Typical localized traffic management procedures (cones and flagmen) will be used to minimize traffic impacts.

6.11.2.2.2 Construction Equipment and Material Hauling

Equipment and materials for construction of the Project will be delivered by truck from various locations. In addition, periodically, waste and recyclable materials will need to be hauled offsite. It is anticipated that approximately 4,000 delivery and haul trips will be required for Project construction. The majority of these trips are expected to arrive/depart along Avenal Cutoff Road to/from either Interstate 5 or SR-198.

Daily and monthly truck traffic will vary, however, even with approximately 4,000 truck trips over a 27-month period, an average of less than 10 truck trips will occur each day. The number of daily deliveries will reach approximately 110 trucks on only two occasions early in the construction period to support large concrete pours. Project-related truck traffic is projected to be spread throughout the operating day.

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TABLE 6.11-4A

**EXISTING AND PROJECTED LEVELS OF SERVICE
CONSTRUCTION**

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	CONSTRUCTION PROJECT (2011)
FREEWAY SEGMENT	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²
SR 41 north of SR 198			
• Northbound	A/A/A/A	A/A/A/A	A/A/A/A
• Southbound	A/A/A/A	A/A/A/A	A/A/A/A
SR 198 east of SR 41			
• Eastbound	A/A/A/B	A/A/A/B	A/A/B/B
• Westbound	A/A/A/A	A/A/A/A	A/B/A/A
SR 198 between Avenal Cutoff Road and SR 41 ¹			
• Eastbound	A/A/A/B	A/A/A/B	A/A/B/B
• Westbound	A/B/A/A	A/B/A/A	A/B/A/A
I-5 north of SR 269			
• Northbound	A/A/A/A	A/A/B/A	A/A/B/A
• Southbound	A/A/A/A	A/A/A/B	A/A/A/B
I-5 south of SR 269			
• Northbound	A/A/A/A	A/A/A/A	A/A/A/A
• Southbound	A/A/A/A	A/A/A/B	A/A/B/B
ROADWAY SEGMENT	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²
Avenal Cutoff Road between Project Driveway and SR 198	C/C/C/C	C/C/C/C	C/C/C/C
SR 269 north of I-5	B/B/B/B	B/B/B/B	B/B/B/B
SR 269 south of I-5	C/C/C/C	C/C/C/C	C/C/C/C
INTERSECTION	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²	LOS AM ¹ /AM ² /PM ¹ /PM ²
I-5 SB Ramps at SR 269			
• SB Left-Through	A/A/A/A	n/a	n/a
• EB Approach	A/A/A/A	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	CONSTRUCTION PROJECT (2011)
I-5 NB Ramps at SR 269			
• NB Left-Through	A/A/A/A	n/a	n/a
• WB Approach	A/A/A/A	n/a	n/a
Avenal Cutoff Road at SR 269			
• NB Left	A/A/A/A	n/a	n/a
• SB Left	A/A/A/A	n/a	n/a
• WB Approach	B/B/B/B	n/a	n/a
• EB Approach	B/B/B/B	n/a	n/a
Jayne Avenue at SR 269	A/A/A/A	n/a	n/a
Jayne Avenue at Avenal Cutoff Road			
• NB Approach	A/A/A/A	n/a	n/a
• SB Approach	A/A/A/A	n/a	n/a
• WB Approach	B/B/B/B	n/a	n/a
• EB Approach	B/B/B/B	n/a	n/a
SR 198 EB Ramps at Avenal Cutoff Road			
• NB Left	A/A/A/A	A/A/A/B	B/B/B/B
• SB Left	A/A/A/A	A/A/A/A	A/A/A/A
• WB Approach	A/B/C/C	A/B/C/C	A/C/E/F
• EB Approach	B/B/C/D	B/B/D/D	C/C/F/F
SR 198 WB Ramps at Avenal Cutoff Road			
• NB Left-Through	A/A/A/A	n/a	n/a
• WB Approach	B/B/A/B	n/a	n/a
SR 198 WB Ramps at NB SR 41			
• NB Left	A/A/A/A	n/a	n/a
• WB Approach	B/B/C/C	n/a	n/a
SR 198 WB Ramps at SB SR 41			
• WB Approach	B/B/B/B	n/a	n/a
SR 198 EB On-Ramp at NB SR 41			
• EB Approach	B/B/C/C	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	CONSTRUCTION PROJECT (2011)
SR 198 at 25 th Avenue			
• WB Left	A/A/A/A	n/a	n/a
• NB Approach	A/A/A/A	n/a	n/a
25 th Avenue at Avenal Cutoff Road			
• NB Left-Through	A/A/A/A	n/a	n/a
• EB Approach	B/B/A/A	n/a	n/a
RAMP	LOS AM/PM	LOS AM/PM	LOS AM/PM
I-5 SB Off-Ramp to SR 269			
• Upstream	A/A/B/B	n/a	n/a
• Downstream	A/A/B/B	n/a	n/a
I-5 SB On-Ramp from SR 269			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
I-5 NB Off-Ramp to SR 269			
• Upstream	A/A/B/B	n/a	n/a
• Downstream	A/A/B/B	n/a	n/a
I-5 NB On-Ramp from SR 269			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 198 WB Off- Ramp to Avenal Cutoff Road			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 198 WB On- Ramp from Avenal Cutoff Road			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	CONSTRUCTION PROJECT (2011)
SR 198 EB Off-Ramp to Avenal Cutoff Road			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 198 EB On-Ramp from Avenal Cutoff Road			
• Upstream	A/A/B/B	n/a	n/a
• Downstream	A/A/B/B	n/a	n/a
SR 198 WB Off- Ramp to SR 41			
• Upstream	A/B/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 198 WB On- Ramp from SR 41			
• Upstream	A/B/A/A	n/a	n/a
• Downstream	B/B/A/A	n/a	n/a
SR 198 EB Off-Ramp to SR 41			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 198 EB On-Ramp from SR 41			
• Upstream	A/A/B/B	n/a	n/a
• Downstream	A/A/B/B	n/a	n/a
SR 41 NB Off-Ramp to EB SR 198			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 41 NB Loop On- Ramp from EB SR 198			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/B/A	n/a	n/a
SR 41 SB On-Ramp from EB SR 198			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a

	EXISTING (2007)	CONSTRUCTION NO PROJECT (2011)	CONSTRUCTION PROJECT (2011)
SR 41 SB Off-Ramp to WB SR 198			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a
SR 41 NB On-Ramp from WB SR 198			
• Upstream	A/A/A/A	n/a	n/a
• Downstream	A/A/A/A	n/a	n/a

¹ = Construction Shift 1 Study Period

² = Construction Shift 2 Study Period

n/a = Not analyzed because traffic congestion is not expected due to low existing traffic flows and existing LOS substantially superior to recommended LOS minimum threshold levels

SR = State Route

I = Interstate

Density = pc/mi/ln

v/c = volume to capacity ratio

6.11.2.2.3 Rail Transport and Delivery of Large Equipment and Material

Large items of equipment and materials (i.e., oversize or heavy loads) are expected to be delivered by rail to a location near the Site and then trucked to the Site. Equipment to be delivered by rail (then truck) is anticipated to include transformers, gas turbines, steam turbine, generators, the steam drum, package boilers, and bundles of tubes or pipes. If such loads exceed weight or size limits, these movements will be performed under appropriate permits from local or state agencies. These permits are granted after appropriate timing for deliveries and routes are selected that can handle these types of loads. Given that the impacts from these deliveries are temporary, and are managed by special local and/or state permits, effects to load roads and highways from movement of heavy/oversize loads are not projected to be significant.

Two potential railroads and rail siding locations have been identified as being feasible for the delivery and off-loading of oversize and heavy equipment and materials. One is located in Corcoran and is operated by BNSF. The spur is attached directly to BNSF's main line and BNSF has appropriate rail cars to transport Project equipment and materials to this spur. The second identified rail siding is located in Huron and is operated by the San Joaquin Valley Railroad.

6.11.2.2.4 Construction Hazardous Materials Transportation

Table 6.11-5 and Figure 6.11-4 provide the estimated types and quantities of hazardous materials expected to be used at the Site during construction, plus the estimated number and anticipated routes of delivery trips. These types of materials are routinely transported over California highways throughout the state each day in accordance with applicable federal, state and local safety requirements. In fact, for the Project, the largest quantities of hazardous materials are represented by commonly transported diesel fuel and gasoline for the construction equipment. Project deliveries for diesel fuel, gasoline or otherwise will be required to comply with all applicable federal, state and local safety requirements for transport of hazardous materials. As a result, impacts from hazardous material transportation will not be significant.

6.11.2.3 Operations and Maintenance Impacts

6.11.2.3.1 Operations Personnel and Deliveries

The Project will be operated and maintained by approximately 25 full-time employees. For purposes of this analysis, these employees are assumed to commute daily to work at the Site, each in their own vehicle. The plant will be operated 24 hours a day, 7 days a week by two 12-hour operating shifts. A Monday through Friday day shift will also be manned by approximately 17 management, engineering and administrative personnel who will work from 8:00 a.m. to 5:30 p.m.

This analysis considered the impacts of 17 workers arriving to work each morning between 7:00 a.m. and 8:00 a.m., while 3 depart at the same time at the end of the 12-hour night shift. An analysis is also provided for the day shift employees who leave at 5:30 p.m. The operational workers are assumed to follow the same routes as assumed for the construction worker analysis shown in Figure 6.11-3. The impact of these workers on the LOS of the studied roadways is shown in Table 6.11-4B. Due to the small number of employees, the LOS on all roadways remains the same on all of the study locations as projected for the period without operation workers (Table 6.11-3). Further, daily truck traffic (i.e., for deliveries and hauling of waste and recyclable materials) will be small, with less than five trucks arriving and departing the Site each day. This small amount of truck traffic will generally be spread throughout the day and will also not cause LOS conditions for any of the study locations to decline below significant levels. As a result, traffic impacts from operations will be less than significant.

6.11.2.3.2 Operations Hazardous Materials Transportation

Table 6.11-6 provides a description of hazardous materials that will be transported to the Site during operation. Hazardous materials transportation will occur in accordance with applicable federal, state and local requirements. Some, such as cleaning chemicals, will be delivered infrequently. Other chemicals that will be delivered on a regular basis include aqueous ammonia, petroleum products, flammable and compressed gases, and small quantities of solvent and propane. All of these materials are commonly transported on roads and highways throughout the United States each day in accordance with applicable federal, state and local requirements. The anticipated hazardous delivery routes are also shown in Figure 6.11-4. Because Project hazardous material deliveries will be subject to the same federal, state and local requirements as materials that are currently transported on local roads and highways each day, impacts will not be significant.

Aqueous ammonia will be transported in a 19.0 percent by weight solution of ammonia in water. At this concentration, it is not designated as an inhalation hazard under Section 32101 of the California Vehicle Code. Instead, aqueous ammonia is classified as corrosive. Trucks used to transport aqueous ammonia are subject to design requirements that assure their integrity to hold the material without leaking. These requirements are specified in 49 CFR 171-180. The trucks are subject to regular safety and integrity inspection according to the requirements of the California Department of Transportation (Caltrans) (Foose, 1999). The Enforcement Services Division of the California Highway Patrol (CHP) is responsible for enforcing the hazardous materials regulations; approximately 300 officers are specially trained, in and assigned to, on-highway commercial vehicle enforcement activities.

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TABLE 6.11-4B

**EXISTING AND PROJECTED LEVELS OF SERVICE
OPERATION**

	EXISTING (2007)	OPERATION NO PROJECT (2012)	OPERATION PROJECT (2012)
FREEWAY SEGMENT	LOS AM ³ /PM ³	LOS AM ³ /PM ³	LOS AM ³ /PM ³
SR 41 north of SR 198			
• Northbound	A/A	A/A	A/A
• Southbound	A/A	A/A	A/A
SR 198 east of SR 41			
• Eastbound	A/A	A/B	A/B
• Westbound	A/A	A/A	A/A
SR 198 between Avenal Cutoff Road and SR 41 ¹			
• Eastbound	A/A	A/A	A/A
• Westbound	A/A	B/A	B/A
I-5 north of SR 269			
• Northbound	A/A	A/A	A/A
• Southbound	A/A	A/A	A/A
I-5 south of SR 269			
• Northbound	A/A	A/A	A/A
• Southbound	A/A	A/A	A/A
ROADWAY SEGMENT	LOS AM ³ /PM ³	LOS AM ³ /PM ³	LOS AM ³ /PM ³
Avenal Cutoff Road between Project Driveway and SR 198	C/C	C/C	C/C
SR 269 north of I-5	B/B	B/B	B/B
SR 269 south of I-5	C/C	C/C	C/C
INTERSECTION	LOS AM ³ /PM ³	LOS AM ³ /PM ³	LOS AM ³ /PM ³
I-5 SB Ramps at SR 269			
• SB Left-Through	A/A	n/a	n/a
• EB Approach	A/A	n/a	n/a
I-5 NB Ramps at SR 269			
• NB Left-Through	A/A	n/a	n/a
• WB Approach	A/A	n/a	n/a

	EXISTING (2007)	OPERATION NO PROJECT (2012)	OPERATION PROJECT (2012)
Avenal Cutoff Road at SR 269			
• NB Left	A/A	n/a	n/a
• SB Left	A/A	n/a	n/a
• WB Approach	B/B	n/a	n/a
• EB Approach	B/B	n/a	n/a
Jayne Avenue at SR 269	A/A	n/a	n/a
Jayne Avenue at Avenal Cutoff Road			
• NB Approach	A/A	n/a	n/a
• SB Approach	A/A	n/a	n/a
• WB Approach	B/B	n/a	n/a
• EB Approach	C/B	n/a	n/a
SR 198 EB Ramps at Avenal Cutoff Road			
• NB Left	A/A	n/a	n/a
• SB Left	A/A	n/a	n/a
• WB Approach	B/C	n/a	n/a
• EB Approach	B/C	n/a	n/a
SR 198 WB Ramps at Avenal Cutoff Road			
• NB Left-Through	A/A	n/a	n/a
• WB Approach	B/B	n/a	n/a
SR 198 WB Ramps at NB SR 41			
• NB Left	A/A	n/a	n/a
• WB Approach	B/C	n/a	n/a
SR 198 WB Ramps at SB SR 41			
• WB Approach	B/B	n/a	n/a
SR 198 EB On-Ramp at NB SR 41			
• EB Approach	B/C	n/a	n/a
SR 198 at 25 th Avenue			
• WB Left	A/A	n/a	n/a
• NB Approach	A/A	n/a	n/a
25 th Avenue at Avenal Cutoff Road			
• NB Left-Through	A/A	n/a	n/a
• EB Approach	B/A	n/a	n/a

	EXISTING (2007)	OPERATION NO PROJECT (2012)	OPERATION PROJECT (2012)
RAMP	LOS AM ³ /PM ³	LOS AM ³ /PM ³	LOS AM ³ /PM ³
I-5 SB Off-Ramp to SR 269			
• Upstream	A/B	n/a	n/a
• Downstream	A/A	n/a	n/a
I-5 SB On-Ramp from SR 269			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
I-5 NB Off-Ramp to SR 269			
• Upstream	A/B	n/a	n/a
• Downstream	A/A	n/a	n/a
I-5 NB On-Ramp from SR 269			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 198 WB Off-Ramp to Avenal Cutoff Road			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 198 WB On-Ramp from Avenal Cutoff Road			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 198 EB Off-Ramp to Avenal Cutoff Road			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 198 EB On-Ramp from Avenal Cutoff Road			
• Upstream	A/B	n/a	n/a
• Downstream	A/B	n/a	n/a
SR 198 WB Off-Ramp to SR 41			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a

	EXISTING (2007)	OPERATION NO PROJECT (2012)	OPERATION PROJECT (2012)
SR 198 WB On-Ramp from SR 41			
• Upstream	B/A	n/a	n/a
• Downstream	B/A	n/a	n/a
SR 198 EB Off-Ramp to SR 41			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 198 EB On-Ramp from SR 41			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 41 NB Off-Ramp to EB SR 198			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 41 NB Loop On-Ramp from EB SR 198			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 41 SB On-Ramp from EB SR 198			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 41 SB Off-Ramp to WB SR 198			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a
SR 41 NB On-Ramp from WB SR 198			
• Upstream	A/A	n/a	n/a
• Downstream	A/A	n/a	n/a

³ = Operation Study Period

n/a = Not analyzed because traffic congestion is not expected due to low existing traffic flows and/or low number of Project vehicle trips

SR = State Route

I = Interstate

Density = pc/mi/ln

v/c = volume to capacity ratio

TABLE 6.11-5

CONSTRUCTION HAZARDOUS MATERIAL DELIVERIES

DESCRIPTION	TOTAL QUANTITY	DELIVERY TRIPS	ANTICIPATED ROUTE(1)	MEANS	SPECIAL HAZARDS
Major Equipment Consumables • Gasoline • Diesel Fuel • Motor Oil	22,200 gallons (gal) Subtotals • 15,000 gal • 7,000 gal • 100 gal	20	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the Site during construction will be via U.S. Department of Transportation (DOT), Caltrans and California Highway Patrol (CHP)-approved methods and routes.
Concrete Form Sealer	400 gal	2	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Cold Galvanized Spray 16 oz. Canisters	27 canisters	1	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Lubricants Lubricants	100 gal 80 pounds	2 2	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Paints	600 gal	8	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Fiber Glass-Roll/Board	250,000 square feet	3	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal. Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Compressed Gases • Oxygen • Acetylene • Argon	40 cylinders 25 cylinders 18 cylinders	5 5 3	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Welding Rod	900 pounds	5	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during construction will be via U.S. DOT, Caltrans and CHP-approved methods and routes.

(1) Actual routes will depend on the vendor location or origin of shipment.

TABLE 6.11-6

OPERATIONS HAZARDOUS MATERIAL DELIVERIES

DESCRIPTION	QUANTITY	DELIVERY TRIPS	ANTICIPATED ROUTE ⁽¹⁾	MEANS	SPECIAL HAZARDS
Aqueous Ammonia (19 percent by weight)	8,000 gal	4/month	North on I-5 and east on Avenal Cutoff Road to Site.	DOT Code MC 307 tank trucks	None. Aqueous ammonia delivered to the site will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Diesel Fuel	600 gal	2/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Solutions Containing Cyclohexylamine and Morpholine	55 gal	1/month	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Carbohydrazide	400 gal	3/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Propane	49 pounds	6/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans and CHP-approved methods and routes.
Light Petroleum Distillates (solvent)	50 gal	6/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans, and CHP-approved methods and routes.
Acetylene	25 pounds	4/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans, and CHP-approved methods and routes.
Hydrogen	744 pounds	6/year	I-5 from the south or north and east on Avenal Cutoff Road, or from the east on Avenal Cutoff Road to the Site.	Truck	None. All hazardous materials delivered to the site during operations will be via U.S. DOT, Caltrans and CHP-approved methods and routes.

⁽¹⁾ Actual routes will depend on the vendor location or origin of shipment.

6.11.2.4 Cumulative Impacts

A 1.5 to 3.5 percent per year growth rate was added to traffic calculations for the Project construction period as well as the operations period for purposes of considering cumulative traffic effects. As shown in Tables 6.11-4A and 6.11-4B, impacts will be less than significant.

6.11.2.5 Project Design Features to Avoid or Minimize Impacts

The following Site characteristics and Project design features assure that the Project will not significantly affect the traffic and transportation facilities:

- The construction work schedule has been designed with two work shifts to reduce construction worker traffic congestion.
- Construction deliveries and worker traffic will enter the Site from the Avenal Cutoff Road entrance where improvements (e.g., turning lanes) will be provided based on a request from the City of Avenal.
- Parking for construction workers will be provided onsite.
- A security gate with a turnaround circle will be within the property to ensure that vehicles waiting to enter the Site are not on Avenal Cutoff Road.
- Construction traffic control procedures will be implemented addressing timing of heavy equipment and building materials deliveries.
- Federal Power will provide a traffic monitor at the intersection of the SR 198 EB ramps at Avenal Cutoff Road for the PM construction work shift traffic period. This measure will be implemented in consultation with Caltrans and the California Highway Patrol. An off-duty traffic officer will be stationed at this intersection to direct traffic such that Project construction workers leaving the Site do not reduce the LOS.

6.11.3 MITIGATION MEASURES

Considering Project design features, there are no significant impacts on traffic and transportation from construction and operation of the Project, therefore, no mitigation measures are required.

6.11.4 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

There are no significant unavoidable adverse impacts on traffic and transportation from either construction or operation of the Project.

6.11.5 LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Laws, ordinances, regulations and standards related to traffic and transportation are summarized in Table 6.11-7. No permits are required for the project related to transportation except for permitting of oversize loads for Project construction. Table 6.11-8 lists agency representatives relevant to traffic and transportation for the Project. Figure 3.0-1 in Section 3.0, Required Permits, provides a schedule for oversize load permitting.

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TABLE 6.11-7

TRAFFIC AND TRANSPORTATION LORS COMPLIANCE

JURISDICTION	LORS/AUTHORITY	ADMNISTERING AGENCY ⁽¹⁾	REQUIREMENTS/ COMPLIANCE	APPROACH TO COMPLIANCE	AFC SECTION
Federal	49 CFR, Chapter II, Subchapter C; and Chapter III, Subchapter B.	Under jurisdiction of states	Requires that transport of hazardous materials be by appropriate class of vehicle.	By meeting standards for the transport of hazardous materials.	Sections 6.11.2.2.4, 6.11.2.3.2 Pages 6.11-21 to 6.11-22
State	California Vehicle Code §35780; California Streets & Highways Code §117, 660-711; 21 CCR §1411.1-1411.6	Caltrans	Requires permit to transport over-size loads over State highways. Enforced by the California Highway Patrol.	By obtaining necessary permits from Caltrans.	Sections 6.11.2.2.2, 6.11.2.2.3 Pages 6.11-15 to 6.11-20
	California Vehicle Code §31300 et seq.	California Highway Patrol	Requires that transport of hazardous materials be on highways that provide the overall shortest transit time.	By selecting route with shortest transit time for transportation of hazardous materials.	Sections 6.11.2.2.4, 6.11.2.3.2 Pages 6.11-21 to 6.11-22
	Guide for the Preparation of Traffic Impact Studies	Caltrans	Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities.	By not impacting Caltrans facilities such that LOS is decreased below C.	Section 6.11.2.1 Page 6.11-12
Local	City of Avenal General Plan	City of Avenal	Maintain a roadway LOS C or better on local streets and Minor Collectors, and a LOS D or better on Collector and Arterial streets.	By not impacting Avenal roadways such that LOS is decreased below C.	Section 6.11.2.1 Page 6.11-12
	Kings County General Plan	Kings County	Minimum LOS for intersections is D. I-5 and SR 198 in Kings County designated as oversize truck routes.	By not impacting Kings County intersections such that LOS is decreased below D.	Section 6.11.2.1 Page 6.11-12
	Fresno County General Plan	Fresno County	Strive to meet minimum of LOS C for county roadways but in no case plan for worse than LOS D.	By not impacting Fresno County roadways such that LOS is decreased below D.	Section 6.11.2.1 Page 6.11-12

⁽¹⁾ Pursuant to CCR Title 20, Appendix B(i)(1)(B): Each agency with jurisdiction to issue applicable permits and approvals or to enforce identified laws, regulations, standards and adopted local, regional, state and federal land permit approval or enforcement authority, but for the exclusive authority of the Commission to certify sites and related facilities.

TABLE 6.11-8

**ADMINISTRATIVE AGENCY CONTACTS
TRAFFIC AND TRANSPORTATION**

AGENCY CONTACTS	AUTHORITY
Caltrans Kien Le 1823 14 th Street Sacramento, California 95814 (916) 322-6001	Heavy/Oversize Load Permit.
City of Avenal Steve Sopp 919 Skyline Blvd. Avenal, California 93204 (559) 386-0629	Advisory.

6.11.6 REFERENCES

2007 Kings County Regional Transportation Plan, Kings County Association of Governments, May 30, 2007.

2007 Regional Transportation Plan: The Long-Range Transportation Vision for the Fresno County Region for the Years 2007 to 2030, Council of Fresno County Governments, 2007.

California Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, State of California Department of Transportation, September 26, 2006.

California Vehicle Code. Section 32101.

City of Avenal General Plan, City of Avenal, August 11, 2005.

Federal Aviation Administration (FAA),
http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/menu/index.cfm,
Site visited November 8, 2007.

Foose, G. California Department of Transportation, District 5 Hazardous Materials Specialist. Personal communication. August 9, 1999.

Fresno County General Plan, The County of Fresno, October 2000.

Fresno County Rural Transit Agency, November 2007, <www.ruraltransit.org>.

Guide for the Preparation of Traffic Impact Studies, California Department of Transportation, December 2002.

I-5 Transportation Concept Report, California Department of Transportation, July 2005.

Kings County General Plan, Kings County Planning Department, Amendment No. 14: January 27, 2004.

Kings County Rural Transit, November 2007, <www.kartaits.com/karhome.htm>.

Sheedy Drayage Co., "Avenal Energy Project, Equipment Transportation Feasibility Study", August 2001.

SR 198 Transportation Concept Report, California Department of Transportation, November 2002.

Traffic Evaluation Research and Analysis. TPG Consulting, Inc., October 2007.