5.13 Traffic and Transportation

This section assesses the potential impacts to the transportation system due to activities associated with the construction and operation of the PHPP. The section addresses applicable LORS; describes the existing transportation system, and current traffic conditions; evaluates potential project impacts; and identifies mitigation measures, as needed.

5.13.1 LORS Compliance

The Project will meet or exceed all applicable LORS pertaining to traffic and transportation. Table 5.13-1 and the following text sections summarize Federal, State, and local LORS that apply to traffic and transportation.

Table 5.13-1 Traffic and Transportation LORS Summary

Regulatory Authority	Applicability	Where Discussed in AFC
Federal		
Title 49, Code of Federal Regulations (CFR), Subtitle B, Parts 171-173, 177-178, 350-359, and Appendices A-G	Addresses safety considerations for the transport of goods, materials and substances. Governs the transportation of hazardous materials including types of materials and the marking of the transportation vehicles.	Sections 5.13.3 and 5.13.4
Title 14 CFR, Aeronautics and Space, Chapter I, FAA-DOT, Part 77	Establishes standards for determining obstructions in navigable air space and sets forth notification of FAA requirements when there is any change.	Section 5.13.3
State		
California Vehicle Code Section 35780; California Streets and Highways Code, Sections 660-711; 21 CCR 1411.1-1411.6	Requires permits for any load exceeding Caltrans weight, length, or width standards for public roadways.	Sections 5.13.3 and 5.13.4
California Streets and Highways Code, Sections 117-660-711	Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery.	Sections 5.13.3 and 5.13.4
California Vehicle Code Section 31300, 31303 *et seq.*	Requires that the transportation of hazardous materials be on state or interstate highways that offer the shortest overall transit time possible.	Sections 5.13.3 and 5.13.4
California Vehicle Code Section 32105	Requires shippers of inhalation hazard or explosive materials must the California Highway Patrol to apply for a Hazardous Material Transportation License and obtain routes approved for material shipping.	Sections 5.13.3 and 5.13.4

Table 5.13-1 Traffic and Transportation LORS Summary

Regulatory Authority	Applicability	Where Discussed in AFC
Local		
Los Angeles County Circulation Element of the County General Plan	Specifies long-term planning goals and procedures for transportation infrastructure system quality in Los Angeles County	Section 5.13.3
Los Angeles County Circulation Element of the County General Plan, Airports	Specifies long-term planning goals development standards and procedures for air transportation in Los Angeles County.	Sections 5.13.3 and 5.13.4
Los Angeles County Circulation Element of the County General Plan, Rail and Highway Crossings	Specifies long-term planning goals and procedures for transportation safety in Los Angeles County	Section 5.13.3
City of Palmdale Circulation Element of the City General Plan	Establishes Level of service (LOS) C or better as a goal, recognizing that LOS D may be acceptable for limited peak periods	Sections 5.13.3 and 5.13.4

5.13.1.1 Federal LORS

Federal laws and regulations that could apply to this Project include the following:

Title 49 Code of Federal Regulations (CFR), Subtitle B, Chapter I, Part 172, Hazardous Materials Regulations, addresses the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

Title 49 CFR, Subtitle B, Chapter I; Parts 171-173; and 177-178 contain national safety standards for the transport of goods, materials and substances over public highways; require proper handling and storage of hazardous materials during transportation.

Title 49 CFR, Subtitle B, Chapter III, Parts 350–399 Motor Carrier Safety Regulations address safety considerations for the transport of goods, materials, and substances over public highways.

Hazardous Materials Transportation Act of 1974; Title 49 Code of Federal Regulations (CFR) Subtitle B, Chapter lll, Part 397.9 directs the Federal Department of Transportation to establish criteria and regulation for the safe interstate transportation of hazardous materials.

Title 14 CFR Regulations, Aeronautics and Space, Federal Aviation Administration, Department of Transportation, Chapter l, Part 77 establishes standards for determining obstructions in navigable air space and sets forth notification requirements to the Federal Aviation Administration when there is a change in land use that would involve the development of any structures over 200 feet above ground level. Notification is also required if the obstruction is less than the specified height and is located within restricted air space in the approach to airports.

5.13.1.2 State LORS

State laws that could apply to the PHPP include the following:

California Vehicle Code Division 1, Section 353 defines hazardous materials.

California Vehicle Code Division 13, Chapter 5, Article 1 Hazardous Materials, Sections 31303 *et seq*. address the transportation of hazardous materials, the routes used, and restrictions thereon.

California Vehicle Code Division 14, Transportation of Explosives, Sections 31600-31309 regulate the transportation of explosive materials.

California Vehicle Code Division 14.1, Transportation of Hazardous Materials, Sections 32000-32053 regulate the licensing of carriers of hazardous materials including noticing requirements.

California Vehicle Code Division 14.3, Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases

California Vehicle Code Division 14.7 Flammable and Combustible Liquids, Sections 34000 *et seq*. address the transportation of flammable and combustible liquids over public roads and highways.

California Vehicle Code Division 14.8 Safety Regulations, Sections 34500, 34501, 34501.3, 34502-7, and 34510-11 address the safe operation of vehicles, including those that are used for the transportation of hazardous materials.

California Vehicle Code Division 2 Administration, Chapter 2.5, Article 1, Sections 2500-2505 and 2531-2532 address the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials.

California Vehicle Code Division 6 Driver's Licenses, Division 6, Chapter 1, Article 3 Sections 12804-12804.5; Chapter 2, Article 3, Section 13369; and Chapter 7 Article 6, Sections 15275-15278 address the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles; also require the possession of certificates permitting the operation of vehicles transporting hazardous materials.

California Vehicle Code Division 15 Size, Weight, and Load, Chapter 5, Article 6 Section 35780 states that overload approvals from the State Department of Transportation are required for transportation of oversized or excessive loads over state highways.

California Streets and Highways Code Sections 117, 660-711 require an encroachment permit from the State Department of Transportation for facilities that require construction, maintenance, or repairs on or across state highways.

California Streets and Highways Code Sections 660, 670, 1450, and 1460 *et seq*. regulate right-of-way encroachment and the granting of permits for encroachment on state and county roads.

5.13.1.3 Local LORS

Local standards that apply to the PHPP are discussed below.

Los Angeles County Circulation Element of the County General Plan. Section 2.3.2 sets a County Policy objective of maintaining a Level of Service (LOS) D on county roads and a LOS C on State or Federal Highways. Section 2.3.3 establishes LOS D as the minimum acceptable standard on County roadways.

City of Palmdale Circulation Element of the General Plan. Policy C1.4.2 states that the City will "strive to maintain a Level of Service (LOS) C or better to the extent practicable; in some circumstances, a LOS D may be acceptable for a short duration during peak periods."

5.13.1.4 Agencies and Agency Contacts

Table 5.13-2 identifies agency contacts for PHPP traffic and transportation issues.

Table 5.13-2 Agencies and Agency Contacts

Agency/Contact	Phone/Email	Permit/Issue
County of Los Angeles Department of Public Works Palmdale Permit Office, Permit Clerk 38126 Sierra Highway Palmdale, CA 93550	(661) 947-4151	Encroachment Permit for work in the County Right of Way and Permits for Oversize Loads on County Roadways
CALTRANS, District 7 100 S. Main Street, Los Angeles, CA 90012	(213) 897-3656	Encroachment Permit for work in Caltrans' Right of Way and Permits for Oversize Loads on State Highways
California DMV 2260-D, East Palmdale Street Palmdale, CA 93550	(800) 777-0133	Licenses for Transport of Hazardous Materials and Wastes
CHP, Motor Carrier Division 2041 West Avenue Lancaster, CA 93536	(661) 948-8541	Approved Routes for Transport of Hazardous Materials and Wastes

5.13.1.5 Required Permits and Permitting Schedules

Table 5.13-3 identifies the required traffic and transportation permits and permit schedule.

Table 5.13-3 Required Permits and Permit Schedule

Permit/Approval Required	Due Date
Los Angeles County Encroachment Permit (for work in County Rights of way)	Submit plans showing work 30 days prior to construction work in public ROW
Los Angeles County Oversize Load Permit	Apply at least 10 working days prior to oversize load on County roadways
Caltrans Oversize Load Permit	Apply at least 7 working days prior to oversize load on State highways. If load exceeds 16 feet in width or 17 feet in height, allow at least one month

5.13.2 Affected Environment

5.13.2.1 Regional Setting

Regional access is provided to the PHPP site and the surrounding area by State Route 14 (SR 14), State Route 138 (SR 138), and to a more limited extent by State Route 58 (SR 58), as indicated in Figure 5.13-1. SR 14 is a primary north/south regional arterial that extends northerly along the eastern side of the Sierra Nevada Mountain Range from the Los Angeles Basin to U.S. 395 at Inyokern. It extends southerly to I-5 at Newhall and links the Project with the greater Los Angeles area.

SR 14 is fully improved to freeway status north of Newhall to SR 58 at Mojave. From there it extends north with a variable width facility and at-grade intersections to U.S. 395. It is a two-lane undivided facility north of Mojave to California City Boulevard where it widens to four lanes with an approximately 90-foot wide median. The divided four-lane section continues north through the Red Rock Canyon area after which it narrows back to two undivided lanes to U.S. 395.

SR 138 is an east/west regional arterial that extends easterly from Palmdale following East Palmdale Boulevard to Pearblossom as the Pearblossom Highway. At Pearblossom, it angles southwest as the Antelope Valley Highway to I-15 at Cajon Junction north of San Bernardino. It links the City of Palmdale with Pearblossom, Adelanto, Victorville and the greater San Bernardino area. SR 138 is generally a two lane facility with localized widening to four lanes at major intersections and through the community of Pearblossom.

SR 58 is a regional facility in the greater project area which extends westerly from Bakersfield over the Tehachapi Pass to Mojave where it intersects SR 14. SR 58 in conjunction with SR 14 north of Palmdale links the City of Palmdale with Bakersfield and Mojave. It is improved to freeway status with two lanes in each direction between Bakersfield and SR 14 at Mojave. East of the City of Boron it continues as a two-way facility with one lane in each direction and at-grade intersections towards Barstow.

5.13.2.2 Local Area Setting

The PHPP plant site is located approximately four miles north of Palmdale Boulevard and two miles east of SR 14 (see Figure 5.13-2). The site is bounded on the north by East Avenue M, on the east by Site Road 1 (access to Air Force Plant 42), on the south by E Ave M-12 and the Plant 42 property, on the west by City-owned vacant land with Sierra Highway approximately ½ mile further west. Access to the site will be at E Ave M and 10th St E, which is an improved, two-lane road extending north of E Ave M. This access point is

linked to the surrounding regional roadway network (SR 14 and Sierra Highway) by both Avenue L and Avenue M (Columbia Way). Both Avenue L and Avenue M intersect SR 14 with grade separated interchanges while the intersection of W Ave L and Sierra Highway is also grade-separated. As described above, E Ave M abuts the northerly edge of the Project site while E Ave L extends east and west approximately ½ mile north of the site and is linked to the site by 10th St E (Challenger Way).

In the City of Palmdale, the backbone of the street network is comprised of roadways extending north and south or east and west along section lines or evenly spaced divisions of sections. Roadways extending east/west are typically "Avenues" ordered alphabetically and roads running north/south "Streets" ordered numerically. Avenue L is classified as a Regional Arterial in the City of Palmdale General Plan. It varies in width beginning with two lanes east of Sierra Highway, then widening to four lanes west to 8th St E, then widening again to six lanes from 8th St E across SR 14 to 10th St. W, narrowing back to four lanes west to 42nd St W, and finally narrowing back to two lanes thereafter. There is an overpass with controlled access at Sierra Highway and the intersections of E Ave L with 10th and 20th St E are controlled with traffic signals.

Avenue M is a primary roadway in the Project area and serves as the primary link between the PHPP plant site and SR 14. It extends westerly from the Project site as E Ave M to the Sierra Highway where it becomes W Ave M. From there it continues west across SR 14 several miles into west Palmdale. It intersects SR 14 with a grade separated partial cloverleaf interchange. The north and southbound ramp junctures are controlled with stop signs. Ave M intersects Sierra Highway with an at-grade intersection controlled with traffic signals. Free running right turn lanes are provided on the eastbound Ave M and southbound Sierra Highway approaches. Traffic conditions at the intersection are further complicated by the presence of the Union Pacific and Burlington Northern and Santa Fe (BNSF) railroad tracks immediately to the east. Avenue M is classified as a Regional Arterial in the City General Plan.

10th St E is a two-way, two-lane roadway extending north from the Project site across E Ave M, E Ave L-8, to E Ave L. Together with E Ave L, it serves as another link to SR 14. Another important roadway is Sierra Highway, which is a major arterial extending from the City of Mojave in Kern County, through Palmdale to the I-5/SR 14 interchange to the south. Within Palmdale it typically consists of four lanes north of Ave R-8, two lanes between Ave R-8 and 1,200 feet south of Ave S, and two lanes to the south. The roadway alignment is generally parallel and adjacent to SR 14. Sierra Highway is also classified as a Regional Arterial in the City's General Plan.

5.13.2.3 Roadway Operating Characteristics

Existing and future roadway operations have been characterized using a peak hour Level of Service (LOS) analysis; LOS provides a standardized means of describing a roadway or intersection's operation by relating traffic volumes to facility capacity. As shown in Table 5.13-4, LOS ranges from A to F with LOS A representing the best conditions (free flow) and LOS F representing the worst (most congested) conditions.

Table 5.13-4 Level of Service Description for Intersections

LOS	Description of Operations	Unsignalized Intersection Average Control Delay per Vehicle in Seconds (Highway Capacity Manual) (1)	Signalized Intersection Average Control Delay per Vehicle in Seconds (Highway Capacity Manual) (1)
A	Uncongested operations, little or no delay. Queues clear in a single signal cycle if signalized. Progression is generally very favorable.	≤ 10.00	≤10.00
B	Operations with very light congestion, little or no delay. Drivers begin to feel somewhat restricted as vehicles fill occasional cycles if signalized. Queues clear in a single signal cycle.	> 10.00 and ≤ 15.00	> 10.00 and ≤ 20.00
C	Stable operations with light congestion, occasional backups on critical approaches. Drivers may have to wait through more than one cycle on heaviest approaches	> 15.00 and ≤ 25.00	> 20.00 and ≤ 35.00
D	Significant congestion on critical approaches, but intersection remains functional. Drivers required to wait through more than one cycle during short peaks if signalized. No long-standing queues formed.	> 25.00 and ≤ 35.00	> 35.00 and ≤ 55.00
E	Unstable operations with significant congestion and some long standing queues on critical approaches. Blockage of intersection may occur if signalized and traffic signal does not provide for protected turning movements. Traffic queues may block nearby intersection(s) upstream of critical approach(s)	> 35.00 and ≤ 50.00	> 55.00 and ≤ 80.00
F	Considered to be unacceptable to most drivers. Traffic demand generally exceeds capacity of the intersection causing stop-and-go operations with excessive delay. Drivers begin looking for alternate routes and changing travel times	> 50.00	> 80.00

(1) Average vehicle delay through intersection, *Highway Capacity Manual, Special Report 209*, (Transportation Research Board, 1994 - 2000)

Existing and Baseline Year 2011 peak hour intersection LOS on roadways potentially accommodating Project-related traffic are summarized in Table 5.13-5, together with forecasts of vehicle delay. The LOS presented is based on forecasts of delay which is or will be encountered by drivers. The Baseline Year 2011 traffic volumes reflect continued growth in surrounding area (SR 14) commensurate with Year 2000 to Year 2006 levels or 5.59 percent per year. Review of Table 5.13-5 shows that most signalized intersections within the Project vicinity currently operate at an acceptable LOS (LOS C or better) during typical weekday periods. The intersections of Ave L with SR 14 north and southbound ramps and 10th St E currently operate at an LOS B/C during both the morning and evening weekday peak hours. Similarly, the signalized intersection of Ave M with 10th St W operates at an LOS C during both peak periods. However, the signalized intersection of Ave M with Sierra Highway operates at an LOS D during both peak periods while

the un-signalized, stop controlled approaches of Ave M at the SR 14 north and southbound ramps, and 10th St E all operate at an LOS E/F during the evening peak hour. The intersection of the SR 14 southbound ramps with Ave M currently meets the criteria during peak hour that warrants signalization. The northbound ramp juncture does not.

Table 5.13-5 also shows that roadways are forecast to experience a slight deterioration in LOS under Year 2011 Project Construction Baseline conditions, which assume continued growth in traffic volumes consistent with growth rates experienced between 2000 and 2006 in the Project area (5.59 percent/year). Review of the table shows that peak hour LOS at the intersections of the north and southbound SR 14 ramp junctures at Avenue M are forecast to deteriorate to LOS F and both are forecast to meet peak hour warrants for signalization in the PM Peak Hour. Peak hour LOS at the intersections of 10th St E with E Ave L and the intersection of 10th St W with E Ave M are forecast to deteriorate to LOS D in the evening.

Table 5.13-5 Intersection Peak Hour Levels of Service (Without the Proposed PHPP)

Intersection	Existing Conditions[1]				Year 2011 Conditions[2]			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay[3]	LOS	Delay[3]	LOS	Delay[3]	LOS	Delay[3]	LOS
SR 14 SB / W Ave L	19.2	B	12.8	B	21.4	C	13.6	B
SR 14 NB / W Ave L	11.6	B	22.1	C	13.1	B	23.8	C
SR 14 SB / E Ave M								
SB Left	36.0	E	70.3	F	86.1	F	212.0	F
SB Right	11.0	B	165.1	F	11.8	B	-	F
SR 14 NB / E Ave M								
NB Left	38.0	E	98.0	F	79.3	F	298.4	F
NB Right	26.8	D	15.1	C	59.3	F	19.7	C
10th St E / E Ave L	13.7	B	19.7	C	17.1	C	31.7	D
Sierra Highway / E Ave M	35.8	D	37.0	D	43.2	D	49.5	D
10th St W / E Ave M	27.8	C	31.8	C	29.0	C	36.4	D
10th St W / E Ave M								
SB Left	41.2	E	66.9	F	65.1	F	-	F
SB Right	14.1	B	20.1	C	16.8	C	31.3	D

1 Wilson Engineering, 2008

2 Caltrans Year 2006 Traffic Volumes expanded to Year 2011 (Estimated Construction Completion) at historical rates Year 2000 to 2006 or 5.59% per year

3 Average Vehicle Delay in Seconds

Table 5.13-6 summarizes existing and future Year 2011 24-hour traffic volumes for roadways in the Project vicinity as well as truck volumes as a percentage of the traffic volumes.

Table 5.13-6 Existing and 2011 Baseline 24-Hour Roadway Traffic Volumes, Approximate Design Capacities, and Truck Volumes

Roadway/ Segment	Existing Conditions[1]				Year 2011 Conditions[2]			
	Travel Lanes	Volume	Approx Capacity[3]	Truck Volumes	Travel Lanes	Volume	Approx Capacity[3]	Truck Volumes
SR 14 N of Ave L	6	79,000	132,000	9.2%	6	101,100	132,000	9.2%
SR 14 S of Ave M	6	99,000	132,000	9.2%	6	126,675	132,000	9.2%
Ave L E of SR 14	6	32,000	54,000		6	37.400	54,000	
Ave M E of SR 14	4	21,800	36,000		6	27,900	36,000	
Avenue M Sierra to 10th St W	4	20,750	36,000		4	26,500	36,000	
Avenue M 10th St W to 20th St E	4	14,010	36,000		4	17,950	36,000	

1 Caltrans, 2007, City of Palmdale 2007

2 Existing Traffic Volumes expanded to Year 2011 (Estimated Construction Completion) at historical rates of 5.59%/year (SR 14 -2000 to 2006)

3 Two way Capacity in vehicles per hour, City of Palmdale, 1993

5.13.2.4 Rail and Bus Transportation

Regionally, the area has an extensive railroad network operated by Union Pacific and BNSF with major yards at Barstow and Colton. The Union Pacific mainline section extends northerly from Los Angeles County adjacent to SR 14 to Mojave where it intersects the BNSF mainline tracks extending westerly from Barstow. The mainline continues northerly and westerly over the Tehachapi Pass to Bakersfield and then turns north up the Central Valley. Union Pacific's Lone Pine Branch extends north from the mainline in Mojave through the Project site to Trona and Lone Pine as indicated in Figure 5.13-1.

There are a number of rail sidings in the immediate vicinity of the plant site that serve Air Force Plant 42/Palmdale Regional Airport. The Project expects to utilize one of these sidings for the delivery during Project construction of a number of pieces of major generation equipment, which then will be transported by truck to the plant site.

Antelope Valley Transit Authority operates local busses throughout the Palmdale and Lancaster area between 6:00 am and 11:00 pm. Route 4 departs the Lancaster Transfer Center hourly and stops nearest the site at Sierra Highway and Ave L.

Regional transit service in area is provided by Kern Regional Transit with the East Kern Express and the Mojave-Ridgecrest Route. The East Kern Express provides service Monday through Saturday between the communities of Bakersfield, Keene, Tehachapi, Mojave, Rosamond, and Lancaster. The Mojave-Ridgecrest Route provides service between Mojave and California City Monday through Saturday. Intercity service is provided between the communities of Ridgecrest, Inyokern, and Mojave on Monday, Wednesday, and Friday.

Santa Clarita Transit operates commuter busses on route 795 daily between Santa Clarita and Lancaster/Palmdale. Dial-A-Ride service is also provided in the communities of Mojave, Tehachapi, and Rosamond. Service is typically available Monday through Saturday. Metrolink provides regular daily rail passenger service between Los Angeles and Palmdale between 6:00 am and 9:00 pm, and between Lancaster and Palmdale between 4:00 am and 6:00 pm.

5.13.2.5 Bicycle and Pedestrian Circulation

Currently there is a major city bicycle trail (the Sierra Bike Trail) parallel to and between Sierra Highway and the railroad mainline west of the plant site. Pedestrian facilities in the Project vicinity exist only at major intersections. Bicycle and pedestrian circulation is limited to shoulders of rural highway and county roads but is not allowed on freeways.

5.13.2.6 Airport Operations

Built in 1940, Palmdale Airport was operated by the United States Government, primarily as an emergency landing strip. In 1946 its operation was turned over to Los Angeles County, for private use. In 1950, the airport was again taken over by the Federal Government for use in building and testing military aircraft, thus establishing operation of U.S. Air Force Plant 42. In 1966, the Los Angeles Department of Airports, now called Los Angeles World Airports, LAWA, acquired several thousand acres of land around Plant 42 to be developed into the future “Palmdale Intercontinental Airport,” with the goal of surpassing the air traffic of Los Angeles International Airport.

Under a Joint-Use Agreement with the U.S. Air Force, LAWA currently operates a passenger terminal on Air Force Plant 42 as LA/Palmdale Regional Airport. Since the passenger terminal opened in 1971, several airlines have operated out of the airport but service has been intermittent; at present limited commuter service is available. In anticipation of the need for future airport capacity to serve the Antelope Valley and the Southern California region, LAWA began land acquisition in 1970 next to Air Force Plant 42 with the intention of constructing and operating a new large commercial service airport when demand warranted. About 17,750 acres are currently owned by LAWA (also see Figure 5.7-1 in AFC Section 5.7, Land Use). However, there are no definitive plans for expansion or construction of new runways by LAWA and the airport master plan has not been updated in over 20 years.

During 2007, there were 34,550 flight operations at Plant 42/Plamdale Regional Airport, with approximately half of these military aircraft (FAA, 2008). Military flight operations are production flight testing, taxi tests, and pilot proficiency training. Approximately 40 percent of the activity is general aviation, consisting primarily of practice instrument approaches to the airport. Commercial operations represented a fraction of one percent of the total flight operations with air taxi operations representing another three percent of the total.

5.13.3 Environmental Consequences

This section discusses the potential impacts of the PHPP on traffic and transportation.

5.13.3.1 Evaluation Methodology/ Significance Criteria

For purposes of this evaluation, significant impacts will be identified as occurring when the proposed project will:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Reduce a roadway segment or intersection level of service (LOS) below acceptable levels, as defined below:
  - Los Angeles County's target for peak hour operations on County roads is LOS D or better and LOS C or better on State Highways. The threshold of significance is that a significant project-related impact occurs if the addition of project-generated trips causes a County facility (roadway segment or intersection) operating at LOS D or better, to degrade to LOS E or worse or for a State facility operating at an LOS C or better, to de-grade to LOS D or worse.
  - The Los Angeles County CMP (Congestion Management Program) indicates a significant impact occurs when a County facility currently operating at an LOS D or better degrades to LOS E or F.
  - The City of Palmdale sets LOS C as a goal but recognizes that LOS D may be acceptable "for a short duration during peak periods" (City of Palmdale, 1993). For purposes of the PHPP traffic analysis, this is interpreted to mean that LOS D will be the minimum acceptable during the limited period of Project construction. Otherwise it is interpreted to mean an LOS C is to be considered the minimum acceptable unless already operating at an LOS D or worse regardless of the Project.
  - The Project adversely affects traffic circulation and parking conditions in neighboring areas because of inadequate onsite parking and/or inadequate on-site circulation.

5.13.3.2 Construction Phase Impacts

Construction of the proposed PHPP would be completed over an approximately 27-month period. The peak construction work force would have approximately 767 people per day during Month 12, with an overall average for the 27-month period of approximately 360 people. Assuming a worst case scenario where all workers commute in separate autos, there would be a peak of 1,534 one-way worker commute trips per day and an average of 720 one-way trips per day. Construction is also forecast to generate an average of approximately 15 one-way truck trips per day with a peak of approximately 50 truck trips per day; the peak truck travel would be during foundation construction and would not coincide with the peak worker commute time frame in Month 12.

A temporary parking area of approximately 10 acres would be required for construction personnel parking (assuming 350 square feet per vehicle) with additional area required for the staging/laydown of equipment, materials and supplies. The Project includes a 50-acre laydown area immediately west of the plant site; this laydown area also will be used for construction vehicle parking and should accommodate Project needs with no impact to surrounding areas.

It is anticipated that the PHPP construction workforce will be drawn from the surrounding local and regional area, including from the greater Los Angeles Basin. As shown in Figure 5.13-4, Project construction traffic from the Los Angeles, Palmdale, and Lancaster areas is expected to follow SR 14 north and south to the site. Traffic approaching from either the Tehachapi or Barstow areas will follow SR 58 east or west as appropriate to SR 14 and then SR 14 south to the site. A small volume of construction related traffic is forecast to be oriented to and from further north on SR 14, e.g., Inyokern and Ridgecrest. A significant portion of the Project construction workforce is expected to come from or at least be temporarily housed in greater Palmdale/Lancaster area.

As a result of existing congestion on Ave M, particularly at the north and southbound ramp junctures with SR 14, Project traffic will be routed from SR 14 to the site using Ave L to 10th St E to limit impacts to Ave M. Figure 5.13-4 and Table 5.13-7 summarize Project construction-related peak hour traffic volumes on roadways in the surrounding area, assuming the majority of Project traffic uses Ave L to travel to and from SR 14. As shown in Table 5.13-7, particularly in comparison to Baseline Year 2011 conditions without the PPHP (Table 5.13-6), Project construction-related increases in traffic, while significant at some locations will be limited; Project traffic will be focused on Ave L which has the capacity to accommodate it. Otherwise local traffic will be dispersed over a number of routes such that they will not cause a degradation of existing peak hour LOS at most locations and would not have significant impacts on existing roadway operations. Most roadways are forecast to continue operating at Baseline Year 2011 without-Project LOS during peak construction when over 765 workers are commuting to/from the site daily. However, the currently un-signalized intersections of 10th street E with E Ave M and E Ave L both are forecast to deteriorate to LOS F; these two intersections will need to be signalized to mitigate this impact; because of the low level of PHPP operations phase traffic (discussed in the following subsection), it is likely that the signal at 10th street E and E Ave L can be a temporary one (only during PHPP construction).

Project construction will involve transport to the plant site of several pieces of equipment that exceed roadway load or size limits and will require special permits for on-road transport. Oversized equipment includes generators, heat recovery steam generator modules, and main transformers. The equipment will be shipped by rail to the nearest available siding and then be trucked the remainder of the way to the site. There are a number of rail sidings in the immediate plant site vicinity that serve Air Force Plant 42 and the PHPP intends to use one of these for delivery of oversized equipment. From the siding, the equipment would be transported via multi-axle trucks. The maximum allowable load without a special permit is 80,000 pounds. Depending on which siding is used and whether or not use of public roadways is required, transport of this equipment may require use of a truck and trailer with multiple axles, advance and trailing warning vehicles, and possibly police control. If State highways are used, the moving contractor will be required to file for and obtain a permit from Caltrans following the determination of the size of the truck and configuration of the axles.

Table 5.13-7 Year 2011 Intersection Peak Hour Levels of Service With Average and Peak Construction Traffic

Intersection	Year 2011 + Average Crews[1]				Year 2011 + Peak Crews[2]			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay[3]	LOS	Delay[3]	LOS	Delay[3]	LOS	Delay[3]	LOS
SR 14 SB / W Ave L	23.9	C	13.6	B	28.8	C	13.6	B
SR 14 NB / W Ave L	13.1	B	24.4	C	12.6	B	25.1	C
SR 14 SB / E Ave M								
SB Left	102.0	F	243.3	F	-	F	-	F
SB Right	11.8	F	379.1	F	-	F	-	F
SR 14 NB / E Ave M								
NB Left	90.1	F	339.0	F	-	F	-	F
NB Right	64.0	F	19.7	C	-	F	-	F
10th St E / E Ave L	42.2	E	129.0	F	206	F[4]	386.4	F[4]
Sierra Highway / E Ave M	44.3	D	52.0	D	46.1	D	55.0	D/E
10th St W / W Avenue M	29.0	C	36.7	D	28.9	C	37.1	D
10th St W / E Ave M								
SB Left	-	F	-	F	-	F[5]	-	F[5]
SB Right	-	F	31.3	D	-	F[5]	-	F[5]

1 Assumes average month construction crew with 360 crew and staff members

2 Assumes peak month construction crew with 767 workers and staff members

3 Average Vehicle Delay in Seconds

4 With signalization and EB right turn lane will operate at an LOS D (42.7 sec delay) during AM peak. With signalization and re-striping the NB approach to a left plus plus a thru/right lane, it will operate at an LOS D (36.5 sec delay) in the PM peak.

5 With signalization and adding an EB right turn lane, it will operate at an LOS C (22.6 sec delay) in the AM peak and LOS E (63.1 sec delay) during the PM peak

With the signalization of the intersection of E Ave M and 10th St E and the temporary signal at Ave L at 10th St E and site access at the newly signalized intersection of E Ave M and 10th St E, transportation impacts associated with construction of the proposed PPHP would not be significant for the following reasons:

- Project traffic will be routed from SR 14 to the site using Ave L to 10th St East to limit impacts to Ave M. With this routing of Project construction traffic, existing signalized intersections are forecast to continue operating at LOS D or better even during peak construction periods (767 workers). The currently un-signalized intersection of 10th Street E with E Ave L is forecast to operate at an LOS D or better if signalized and the northbound approach is re-striped with an exclusive left and a combination through/right turn lane; the currently un-signalized intersection of 10th St E with E Ave M is forecast to operate at an LOS C in the morning and LOS E during the evening peak hour if signalized.

- The requirements to obtain special permits to move oversize or overweight materials and equipment to and from the site would ensure use of proper vehicles, scheduling, routes, and escorts to minimize impacts.

- No bike lanes are currently present in the immediate Project area that would be impacted by construction traffic.

5.13.3.3 Operations Phase Impacts

PPHP Project operations will generate very small amounts of vehicular traffic. The Project operations phase workforce is estimated at a total of 36 workers, who will cover operations on a 24 x 7 basis (i.e., peak hour weekday traffic will be less than 36 vehicles even if every employee commutes alone in their own vehicle). Project operations traffic volumes on surrounding roadways are summarized in Figure 5.13-5. PPHP operations also will involve truck traffic for delivery of materials and supplies as well as for other purposes such as the offsite shipment of wastes. An estimated total of approximately 68 truck trips per month are expected, an average of between two and three truck trips per day. Approximately 45 of these truck trips are expected to be shipments of solid waste from the site (primarily residual solids from the water treatment system), with the remainder deliveries of materials and supplies. Given the minimal Project traffic volumes, no changes in LOS and no significant impacts are expected.

Project truck travel will include approximately 15 deliveries per month of hazardous materials, 14 of which will be aqueous ammonia. It is expected that hazardous materials shipments would utilize SR 14 to access the PPHP site from the south. Hazardous materials shipments will comply with applicable regulations in terms of route selection, operator training and qualifications, etc (also see Section 5.6, Hazardous Materials Handling).

Transportation impacts associated with operation of the PPHP would not be significant for the following reasons:

- The project will generate a maximum of 36 one-way employee commute trips per day spread over a 24 hour period. As indicated in Table 5.13-8, surrounding roadways are expected generally to operate well below capacity. The addition of this traffic volume to the existing roadway network will not alter existing or future roadway operating characteristics (LOS).
- Truck travel and other non-employee site visits will be very small and typically would occur during non-peak periods.
- Project design will not impact the ability to provide bike lanes in the future and PHPP traffic levels would not have significant adverse impacts on bike lanes that might be developed.

Table 5.13-8 2011 Baseline 24-Hour Roadway Traffic Volumes, Project Construction Traffic Volumes and Project Operations Traffic Volumes

Roadway/ Segment	Peak Construction Conditions[1]				Future Operational Conditions[2]			
	Travel Lanes	Background Traffic Volumes	Approx. Capacity[3]	Project Traffic Volumes	Travel Lanes	Background Traffic Volume	Approx. Capacity[3]	Project Traffic Volumes
SR 14 North of Ave L	6	79,000	132,000	306	6	101,100	132,000	6
SR 14 South of Ave M	6	99,000	132,000	536	6	126,675	132,000	12
Ave L/East of SR 14	6	32,000	54,000	998	6	37,400	54,000	0
Ave M/East of SR 14	4	21,800	36,000	-	6	27,900	36,000	24
Ave M/Sierra Highway to 10th St E	4	20,750	36,000	154	4	26,500	36,000	36
Ave M/10th St E to 20th St E	4	14,010	36,000	154	4	17,950	36,000	0

1 Assumes 767 Construction workers and staff, Year 2008 traffic volumes
2 Assumes future Year 2011+ operations after construction is complete with three shifts per day
3 Two way Capacity in vehicles per hour

5.13.3.4 Potential Impacts on Aircraft Operations

The following subsections address potential impacts of the PHPP on aircraft operations at Air Force Plant 42. The Project plant site is located adjacent to the northwest corner of this joint use military airport. Three elements of the Project were identified that could potentially impact flight operations are: 1) operation of the plants combustion turbines and HRSGs, 2) operation of the plant's cooling towers, and 3) glare from the solar mirror collector array.

PHPP operations could lead to a number of potential issues of concern with respect to flight operations at Air Force Plant 42:

- PHPP facility stacks may produce a hazard to low flying aircraft,
- Saturated plumes from the plant's HRSG stack may cause visibility obstructions and thus produce a hazard to aircraft operations,
- Saturated cooling tower plumes may cause visibility obstructions and thus produce a hazard to aircraft operations,
- Plumes from the HRSG stacks will cause turbulence that may adversely affect flight operations, and
- The solar collector mirrors may produce a visual distraction to pilots.

The following paragraphs assess potential impacts of PHPP operations on operations at Plant 42/ Palmdale Regional Airport in terms of the five issues of concern mentioned above. The conclusions of these analyses are supported by real world experience under similar environmental conditions in the high desert. The High Desert Power Plaint operates three combustion turbine/HRSG units and a cooling tower immediately adjacent to the Southern California Logistic Airport (SCLA), in Victorville approximately forty-two miles east of the PHPP site. A second power plant, the Victorville 2 Hybrid Power Project, was recently licensed by the CEC for a location approximately three miles north of HDPP. A letter from the SCLA airport operator indicating that HDPP HRSG and cooling tower plumes have not posed any hazards to flight operations at SCLA is provided in AFC Appendix E (Heldreth, 2005). The HDPP HRSG and cooling tower plumes are sufficiently similar to the expected plumes from the Project to support reliance on the SCLA letter as indicating a lack of potential hazards to aviation from the Project plumes. Additional analysis of the PHPP HRSG and cooling tower plumes is provided below.

Compliance with FAA Height Restrictions

FAR Part 77.13 identifies notification requirements for proposed construction. In general, notification is required for:

- Construction or alteration of more than 200 feet above the ground level at the site, and
- Construction or alteration of greater height than an imaginary surface extending outward and upward at the following slopes:

  100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway at airports with at least one runway greater than 3,200 feet In length (excluding heliports).

  50 to 1 for a horizontal distance of 10,000 feet from the nearest point on the nearest runway of each airport with its longest runway no more than 3,200 feet in length.

  25 to 1 for a horizontal distance of 5,000 feet from the nearest landing and takeoff area of a heliport
- Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted by 17 feet for an Interstate, 15 feet for local road, or 23 feet for a railroad would exceed the standards in A or B of this section.
- When requested by FAA.
- Any construction on an airport or heliport.

Table 5.13-9 shows elevation data for the Project's two HRSG stacks. Analysis indicated that both stacks penetrate the imaginary surface rising at a rate of 100 to1 from the nearest point of Runway 7-25 at Plant 42/Palmdale Regional Airport. The proposed stacks penetrate the 100 to 1 surface by approximately 64 feet, and thus notification is required through the filing of a 7460-1 Notice of Proposed Construction form to the Federal Aviation Administration (FAA).

Table 5.13-9 HRSG Stack Location and Elevation

Feature	Lat - Lon	Structure Height Above Ground Level (AGL)	Structure Elevation Above Mean Sea Level (AMSL)
Stack 1	N34°38' 25.2712"' W118 06' 22.9516"	145	2645.40
Stack 2	N34°38' 23.9840"' W118 06' 22.9518"	145	2646.02

Federal Acquisition Regulations (FAR) Part 77 establishes standards for determining obstructions to air navigation. It applies to existing and proposed man made obstacles, objects of natural growth and terrain. FAR Part 77.25 and 77.28 establishes imaginary surfaces surrounding airfields (civil or military) with specially prepared hard runway surfaces. Each of the surfaces vary in dimension and shape based on the category of aircraft operating at the airfield.

A review of FAR Part 77 imaginary surfaces for the PHPP was conducted that considered imaginary surfaces identified in 77.28 Military Airport Imaginary Surfaces. This analysis indicates the HRSG stacks fall within in the area of the Inner Horizontal Surface. The Inner Horizontal Surface is approximately 2693' AMSL. As shown in Table 5.13-9, the maximum height of the PHPP stacks is 2646.02' AMSL. Thus, there no FAR Part 77 impacts would be expected as a result of the proposed PHPP stacks.

The locations of the HRSG stacks are in proximity to the departure end of Tactical Runway 252 at Plant 42 and could be within the flight pattern of the runway. The Air Force has reviewed the PHPP at the local level and found that the PHPP HRSG stacks are within the Tactical Traffic Pattern of military aircraft operating off of the tactical runway and should not interfere with military flight operations.

HRSG Plume Visible Plume Analysis

A stack plume visibility analysis was conducted for the water vapor emissions of the Project HRSG stacks to determine the frequency and dimensions of visible plumes. The potential for water vapor emissions to form visible plumes depends on the amount of water vapor in the exhaust gas, the temperature and volume of the exhaust gas, and the temperature and moisture content of the ambient air.

The unsaturated exhaust plume exiting a stack mixes with ambient air and is diluted. For a given volume of stack exhaust mixed with ambient air, the following sequence of activities is used to determine whether or not the resultant vapor plume will be visible:

- First, the resultant temperature and water vapor density of the diluted plume are determined by use of temperature and mass balance equations.
- The saturation vapor pressure of water then is calculated for the resultant temperature of the diluted plume.
- The saturation vapor density of the diluted plume then is calculated from the saturation vapor pressure.
- If the vapor density of the diluted plume is greater than the saturation vapor density, then condensation is assumed to occur and the plume is considered to be visible.

The steps described above were performed on an hourly basis for an array of receptor locations of sufficient resolution to estimate frequency, direction and length of visible plumes. Dispersion modeling results from AERMOD, in the form of hourly normalized concentrations (i.e. based on 1 g/sec), and concurrent hourly values of ambient dry bulb and dew point temperature were input to a Fortran program, VIZDET (developed by ENSR) which performs the calculations described above.

This analysis was conducted with the three-year Plant 42 meteorological data base used in the AERMOD air quality analysis. In addition to the AERMOD model output and meteorological data, source data including the water vapor emission rate, stack exhaust flow rate and exhaust temperature are also input to VIZDET. These input data are summarized in Table 5.13-10.

Table 5.13-10 Turbine Data Required for Vapor Plume Analysis

Parameter [1]	Value
Water vapor emission rate	248,348 lbs/hr
Exhaust flow rate	940,671 ACFM
Exhaust temperature	166 ^{o}F
[1] Representative of full load operation.	

The stack visible plume results were sorted by plume length to identify the maximum as well as the 50th percentile (representative average visible plume) and 90th percentile (representative worst-case) visible plumes. The results are summarized in Table 5.13-11. The maximum predicted plume length for the combustion turbine stacks is 2,480 meters (8,136 feet) and was modeled for just one hour out of the three-year meteorological data base analyzed. A more representative worst-case is the 90th percentile plume length of 80 meters (262 feet) which is estimated to occur approximately 38 hours/year on average based on the three-years modeled. The closest distance to an airport runway from the HRSG stacks is approximately 800 meters (0.5 mile). There are only three modeled hourly occurrences of HRSG visible plume lengths that extend to 800 meters or greater, the maximum plume length of 2,480 meters and the second and third highest prediction of 1,320 and 880 meters, respectively. These modeling results indicate that the visible stack plumes from the HRSG stacks will be limited in terms of frequency and dimensions and visible stack plumes would not be expected to be of major concern with respect to potential impact on aircraft operations at the airport.

Table 5.13-11 Turbine Stack Vapor Plume Modeling Results

Plume Length Case	Length (m/ft)	Frequency (hrs/yr) [1]
Maximum	2,480/8,136	<1
90 Percentile	80/262	38
50 Percentile	20/65	329
[1] Average based on three years modeled.		

Cooling Tower Visible Plume Analysis

The Seasonal and Annual Cooling Tower Impacts (SACTI, Version 9/30/90) model was applied to assess the potential for ground-level fogging and icing impacts associated with the operation of the Project cooling tower. In addition, SACTI estimated the potential frequency and dimensions of elevated plumes. SACTI was developed by the Electric Power Research Institute (EPRI); it is a validated model designed for assessing cooling tower plume impacts and is widely accepted by State agencies for regulatory applications.

Cooling tower "fogging" occurs when the condensed water vapor plume comes in contact with the ground for short periods of time near the tower. Although this potential impact is referred to as fogging, it is not the type of area-wide atmospheric fogging that is generally thought of when the term "fog" is used. Cooling tower plume touchdown or fogging is transient and localized. The SACTI model estimates the number of hours per year that ground-level fogging will occur at specified receptor locations. Ground-level icing is predicted to occur when a visible plume touches the ground under subfreezing weather conditions. The atmospheric conditions associated with predictions of ground-level fogging are high winds (≥10 m/sec) and high relative humidity or low atmospheric saturation deficits. The high winds, which cause aerodynamic downwash of the condensed vapor plume, are the primary factor in transporting the plume to the ground.

SACTI requires hourly meteorological data including measurements of temperature, relative humidity, wind speed, and wind direction. The SACTI model was applied with the 3-years (2002-2004) of wind speed, wind direction, relative humidity and temperature data from the adjacent Plant 42 meteorological station consistent with the air quality modeling. The outputs of the SACTI model are in terms of frequency of occurrence of various visible plume impacts on an annual basis and by season. To estimate frequency of occurrence by daylight or nighttime periods the meteorological data input to the model can be screened to include the desired hours (e.g., daytime only hours based on sunrise and sunset times) and then SACTI can be applied for that subset of data to determine visible plume data for those periods. For assessment of potential ground-level plume fogging and icing all hours of meteorology were assessed. To assess elevated visible plumes, the complete meteorological data base was evaluated to estimate potential aviation impacts as discussed below, as well as daytime only conditions for potential visual resources impacts (see Section 5.15 Visual Resources).

The modeling was performed with a polar receptor grid centered with respect to the proposed cooling tower. Consistent with SACTI model default requirements, receptors were spaced at 100-meter increments along 16 equally spaced radials (22.5 degree increments) out to two kilometers. Typically, cooling tower fogging/icing impacts are limited to within two kilometers of wet mechanical draft cooling towers.

The cooling tower performance data required by SACTI representative of base load operations for the proposed tower wet mechanical draft cooling tower are listed in Table 5.13-12. The SACTI model was applied with all three-years of meteorological data.

Table 5.13-12 Tower Performance Data Input to SACTI

Parameter	Value
Number of Cells	10
Height of Fan Stack	62 ft
Length of Tower	301 ft
Width of Tower	109 ft
Exit Diameter of a Single Fan Stack	28 ft
Tower Heat Rejection Rate [1]	455 MW
Tower Input Air Flow Rate [1]	7922 kg/sec
[1] Representative of full load operation.	

SACTI estimated no potential hours of ground-level plume icing. Ground level fogging impacts estimated by the modeling were limited to sectors to the east of the tower (north-northeast, northeast, east-northeast, east and east-southeast). The ground-level fogging impacts are very limited beyond the property line and the bulk of the fogging is estimated to occur within the property boundary. The model estimated a maximum of 1.6 hours per year of ground-level plume fogging beyond the property line. This receptor is located approximately 300 meters to the northeast of the cooling tower on Site Road 1.

The SACTI model also provided estimates of elevated visible plumes in terms of plume length and frequency. The SACTI model estimated plumes were sorted by visible plume length to identify the maximum as well as the 50th percentile (representative average visible plume) and 90th percentile (representative worst-case) visible plumes. The results are summarized in Table 5.13-13. The results presented in Table 5.13-13 are for all hours (day and night), because a visible plume could potentially pose a hazard to aviation regardless of whether it is daytime or nighttime. The closest distance to an airport runway from the cooling tower is approximately 900 meters (0.6 miles). As indicated by the 90 percentile plume length of 61 meters (200 feet) in Table 5.13-13, most of the time visible plumes will not extend beyond the property boundary. However, as indicated by the maximum plume length (9,740 meters), there will be some potential for plumes to extend to and beyond the airport runways. The model results were analyzed to determine the potential frequency of plumes that extend toward airport runways (i.e. trajectories to the southern sectors; plume headings of 90º through 270º). Based on the modeling results, visible plumes were modeled to extend to and beyond the runways approximately 1.3 percent of year (i.e., about 116 hours/yr).

The two meteorological factors that are most significant in determining the potential for vapor plume formation are the ambient temperature and the relative humidity. Both of these quantities tend to be most favorable to vapor plume formation during nighttime winter hours in the Palmdale area. Given the dry, desert location, relative humidity tends to be low and ambient temperature warm during the daytime hours. Consequently, any lengthy vapor plumes that form will tend to form during periods with lower temperatures and high humidity such as during periods of winter precipitation when ambient visibility may already be reduced.

Table 5.13-13 Cooling Tower Elevated Plume Modeling Results

Plume Length Case	All Hours	
	Length (m/ft)	Frequency (hrs/yr) [1]
Maximum	9,740/32,000	32
90 Percentile	61/200	962
50 Percentile	23/75	4,563
[1] Average based on 3 years modeled.		

This modeling analysis can be supported by real world experience under similar conditions. As noted earlier, the HDPP is operating three combustion turbine/HRSG units and a cooling tower adjacent to the SCLA in Victorville and the SCLA airport operator has indicated that HDPP HRSG and cooling tower plumes have not posed any hazards to flight operations at SCLA (Heldreth, 2005).

HRSG Thermal Plume Analysis

The impact of turbulence from HRSG stack plumes is considered not significant. The most critical time for turbulence from a power plant stack plume to impacts aircraft operations will be when aircraft are on their final approach for landing. When Runway 7 is in use, approaching planes will be landing to the east and will be on final approach from the west over a mile south of the plant site. For Runway 7 to be active, the winds will need to be from the easterly direction. With wind from the east, any plumes from the PHPP would be advected to the west parallel to the approach to Runway 7 and separated from the approach pattern by up to a mile or more.

The wind would have to be from the northwest for a power plant plume to be transported directly over the nearest runway. Winds from the north or northwest direction occur approximately five percent of the time. For a wind from the northwest, it is most likely that Runway 25 will be active, and all approaching aircraft will be approaching from the east, well away from the power plant and its plumes. Consequently, it is unlikely that plumes from the power plant would drift over the active approach to runways at Plant 42 and potentially impact slow moving aircraft on final approach.

As noted earlier, the HRSG stacks are 1.6 miles from the nearest Plant 42 runway (approach end of Runway 7) and at times when the wind flow direction is from the power plant site toward Plant 42, at an average daytime wind speed of six mph, it will take the plume 16 minutes to drift over the approach end of Runway 7. During this time, plume turbulence will dissipate and will become indistinguishable from ambient atmospheric turbulence. As the approach end of Runway 25 is even farther away from the HRSG stacks, plume turbulence is likewise not a significant issue for the approach to Runway 25.

Even though the potential interaction of a slow moving aircraft with a power plant plume will be rare, ENSR performed a modeling analysis to examine expected turbulence in the exhaust plumes. In this analysis, the potential vertical and horizontal plume turbulence in a power plant plume was compared to natural convective turbulence. The natural background turbulence levels in the summertime in the Palmdale area can be quite significant, due to intense convective thermals from the strong solar heating. The analysis demonstrated that only in the immediate vicinity of the stack (within approximately 1,100 feet horizontally and 300 feet vertically), would plume turbulence approach values observed in natural convection-induced events such as strong dust devils.

The power plant stacks will be 1.6 miles from the approach end of Runway 7 and much farther from the approach end of Runway 25. Modeling indicates that on a typical day with an average daytime wind speed of six mph, the diameter of the exhaust plumes would be 60 meters at 200 meters elevation. Given that the final approach landing speed of military aircraft is on the order of 120-140 knots, an aircraft at this altitude would pass through the plume in less than a second. For general aviation aircraft, which land at lower speeds than military aircraft, the time to traverse the plume would be slightly longer. At a distance of one mile from the stack, the turbulence in the plume is likely to be indistinguishable from natural background turbulence levels in a desert environment. Also, the speed and momentum of the aircraft will easily carry the aircraft though any plume that is encountered. Thus, if interactions occur between slow moving aircraft and plumes from the power plant, the interactions will be very brief and the turbulence will not be significantly different from natural turbulence levels.

Aircraft taking off are unlikely to be impacted because these aircraft are under full power and are accelerating. The time a plane would be influenced by any potential turbulence from a plume is a fraction of a second and the speed and momentum of the plane would quickly carry it through any plume that was in its path. Please note also that the letter from the SCLA operator mentioned earlier also states that they have received no reports indicating any turbulence caused by HDPP stacks.

Solar Array Visual Distraction Potential

The solar thermal portion of the PHPP will use arrays of parabolic trough mirrors. Each of the parabolic solar collector mirrors is parabolic in shape and focuses all light falling on it into its central pipe containing the heat transfer fluid, which limits the potential for stray reflections. The receiver tube may glow as the reflected rays enter the collector. The receiver tube may glow as the sun's reflected rays enter the collector. The reflections from the curved surface of the receiver tube are much lower in intensity than those associated with a reflection of the sun in a mirror. The reflections from a solar thermal array are similar to those one would observe from a body of water if the viewer is in the right spot. A pilot could observe the glow if the aircraft were positioned at the correct angle above the array, but it would not be a bright source of glare.

The Solar Energy Generating System (SEGS) solar energy power plants in the Mojave Desert at Harper Lake and Kramer Junction have been operating since the 1980's and thus provide real world information concerning the potential for glare impacting pilots. During a public workshop held as part of the CEC's Victorville 2 Hybrid Power Plant licensing process, the Chief Operating Officer of Abengoa Solar, Inc. (a firm that manufactures solar thermal equipment), who previously managed the Kramer Junction SEGS facility, noted that glare has not been reported as a distraction to pilots in the nearly 20 years that the SEGS plants have been in operation (Frier, 2007). Further, as reported in the CEC's Final Staff Assessment (FSA) for the Victorville 2 Project, Caltrans Aeronautics and Energy Commission staff flew around the Kramer Junction and Harper Lake SEGS facilities during a sunny morning in October 2007at an altitude of about 1,500 feet and characterized the reflections as "similar to what is experienced when flying over a lake or a pond" (CEC, 2008).

In light of this historical experience of no recorded aviation safety issues related to the existing SEGS plants, supported by the characterization of the reflections on a recent overflight that included CEC and Caltrans staff as similar to a body of water, no significant adverse effects would be expected from the PHPP solar array on aviation operations.

5.13.3.5 Cumulative Impacts

Table 5.13-8 includes Baseline Year 2011 peak hour traffic forecasts for major roadways in the PPHP vicinity. These forecasts assume continued development and growth in traffic volumes consistent with growth rates experienced on SR 14 in the Project vicinity between 2000 and 2006 (5.59 percent/year). Also included in the table are estimates of traffic associated with future PHPP operations. The Project will generate minimal traffic volumes during operation given that the total work force will be less than 40 people for 24/7 operation. Project volumes during peak hours will be less than daily fluctuations in existing traffic volumes and the increases will be unnoticed by existing motorists and will not impact traffic operations. Thus, while the Project will temporarily contribute to cumulative traffic congestion during construction, during operation, the Project's cumulative vehicular traffic impacts will be negligible. None of the cumulative projects would emit visible or thermal plumes and thus the Project would not have significant cumulative impacts on aviation traffic.

5.13.4 Mitigation Measures

The following measures are proposed to mitigate Project traffic and transportation impacts during construction. No mitigation measures are required or proposed during operation.

TR-1 Develop and implement a construction phase Traffic Management Plan (TMP) in consultation the City of Palmdale for the roadway network potentially affected by construction activities at the plant site and offsite linear facilities. The TMP will address issues such as the timing of deliveries of heavy equipment and materials, possible street or lane closures, detours of construction traffic with a flagman, use of signage and traffic control devices, ensuring access for emergency vehicles to the Project site, etc. The plan should include directing construction traffic to and from SR 14 to use E Ave L

TR-2 Signalize the intersection of E Ave M and 10th St E**.** Widen the northbound approach or project driveway to include a separate left and combination through/right lanes

TR-3 Signalize the intersection of E Ave L and 10th St E**.** Widen the eastbound approach to add an exclusive right turn lane. Re-stripe the northbound approach of 10th St E to include a separate left and combination through/right lanes.

TR-4 Conduct construction activities in accordance with Caltrans and other applicable limitations on vehicle sizes and weights, Construction Excavation Permits obtained from City of Palmdale and Los Angeles County and Oversize load Permits from Caltrans, Los Angeles County, and City of Palmdale as well as permits and licenses from the California Highway Patrol and Caltrans for the transport of hazardous substances.

5.13.5 References

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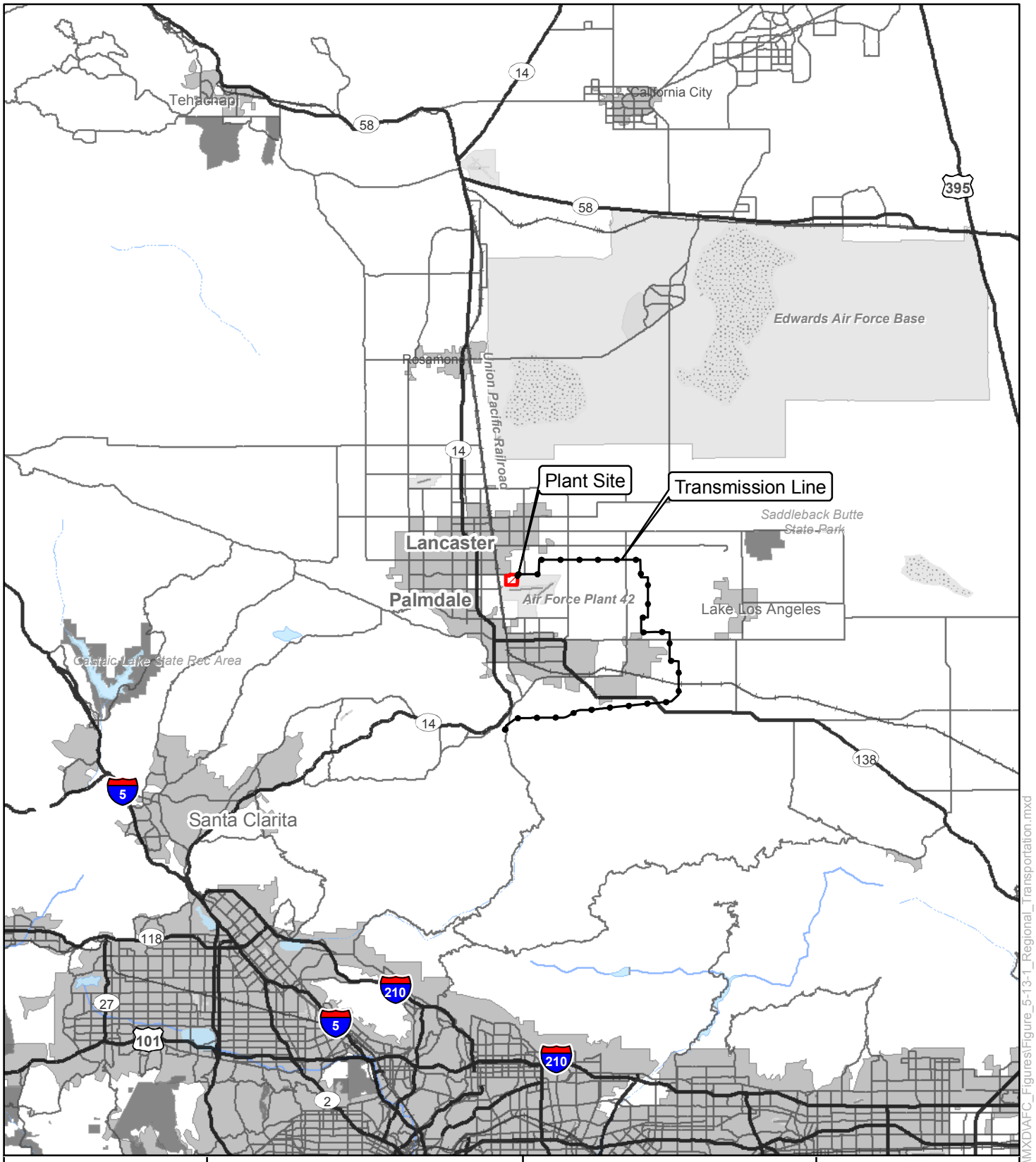

Map Location

Legend

- Transmission Line
- Project Site
- Railroad
- Highway
- Major Road

N W E S

Palmdale Hybrid Power Project

Figure 5.13-1
Regional Transportation Access

1:600,000

0 5 10 15 Miles

PALMDALE
a place to call home

Inland Energy, Inc.

ENSR | AECOM

Project: 10855-002
Date: July 2008

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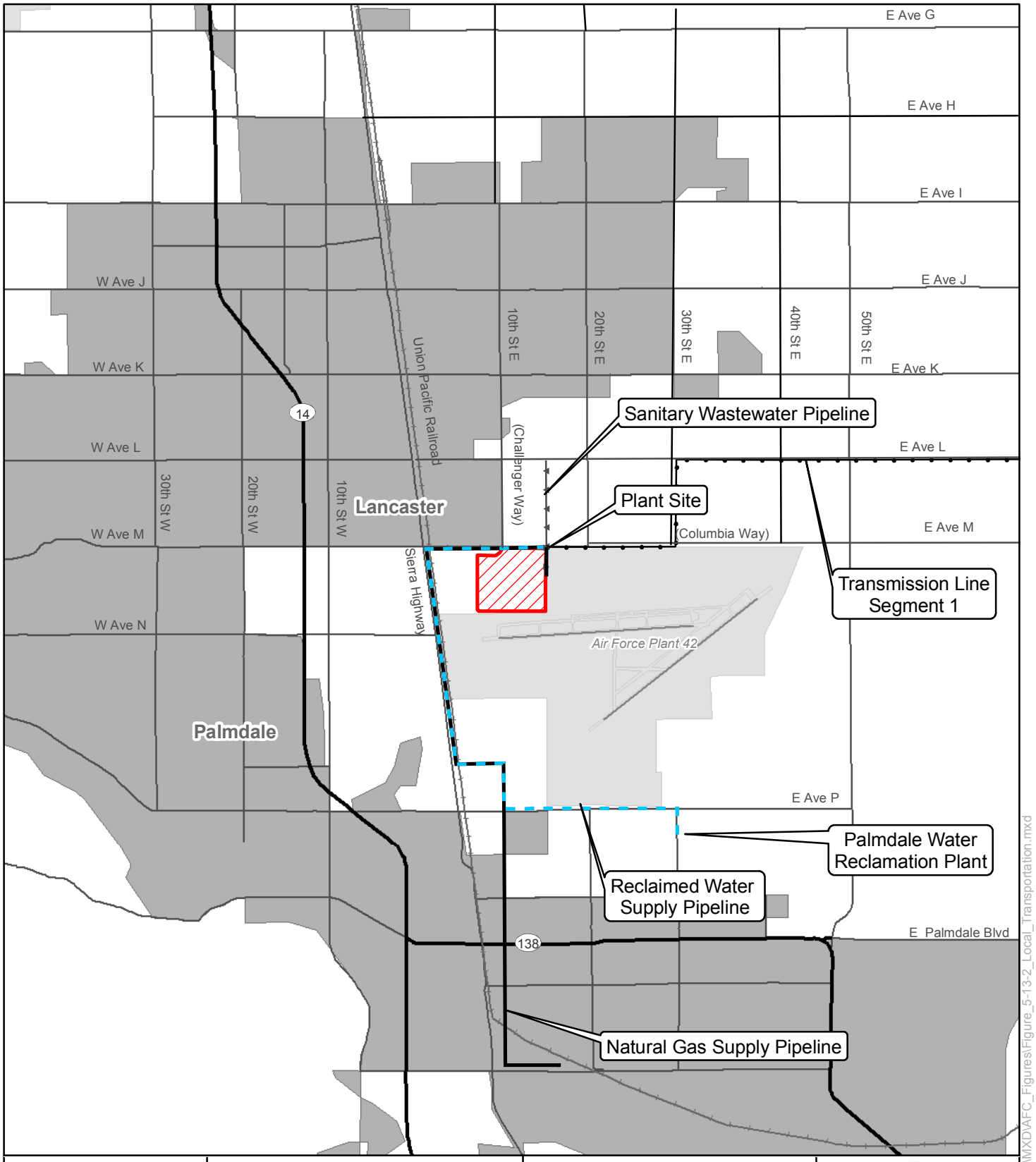

Map Location

Legend

- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Sanitary Wastewater Pipeline
- Transmission Line
- Project Site
- Highway
- Major Road
- Railroad

N W E S

Palmdale Hybrid Power Project

Figure 5.13-2
Local Transportation Access

1:100,000

0 1 2 Miles

PALMDALE
a place to call home

Inland Energy, Inc.

ENSR | AECOM

Project: 10855-002
Date: July 2008

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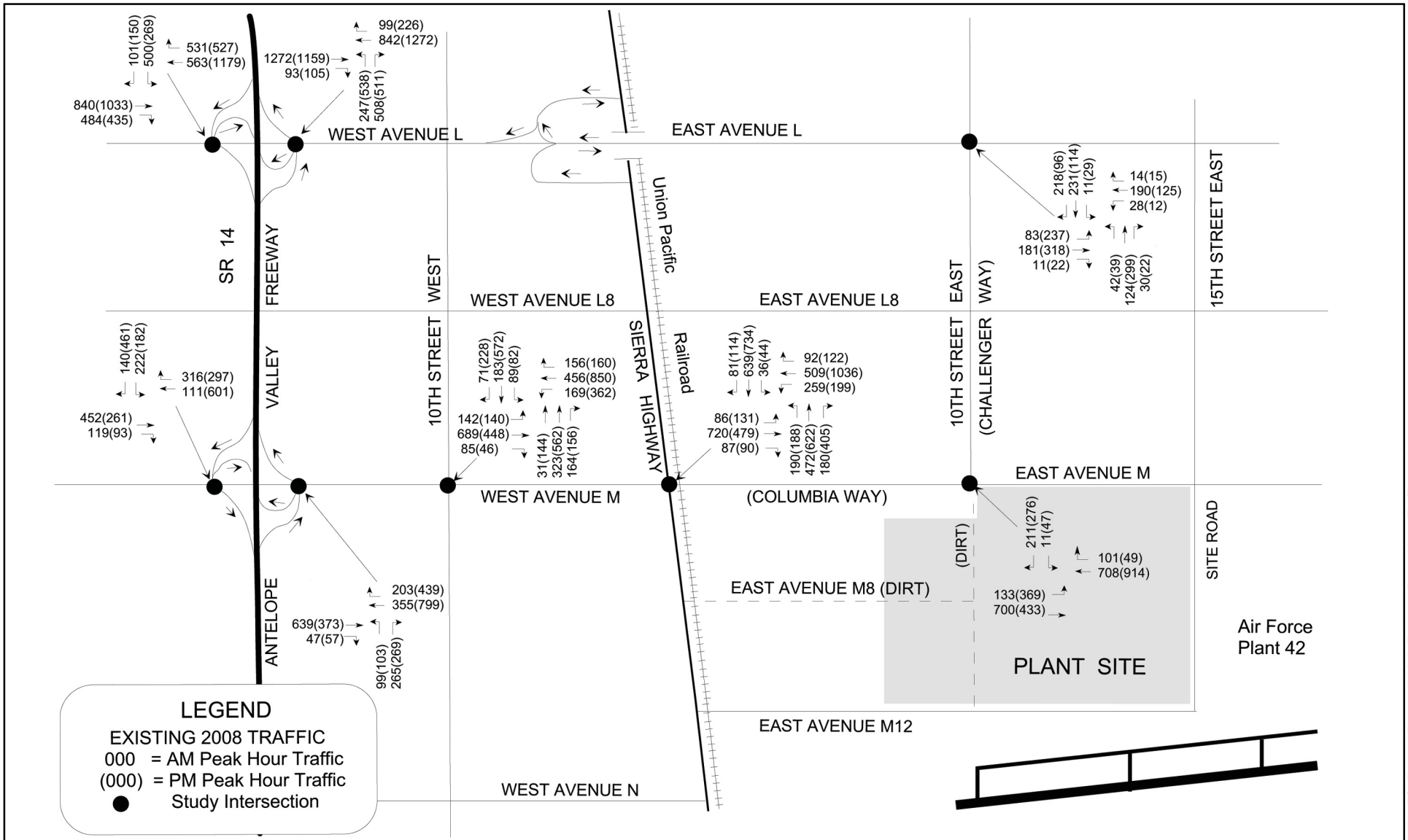

Map Location

Not to Scale
Data Source: Wilson Engineering 2008

Palmdale Hybrid Power Project

Figure 5.13-3

Existing Peak Hour Traffic

PALMDALE
a place to call home
Inland Energy, Inc.
ENSR | AECOM

Project: 10855-002
Date: June 2008

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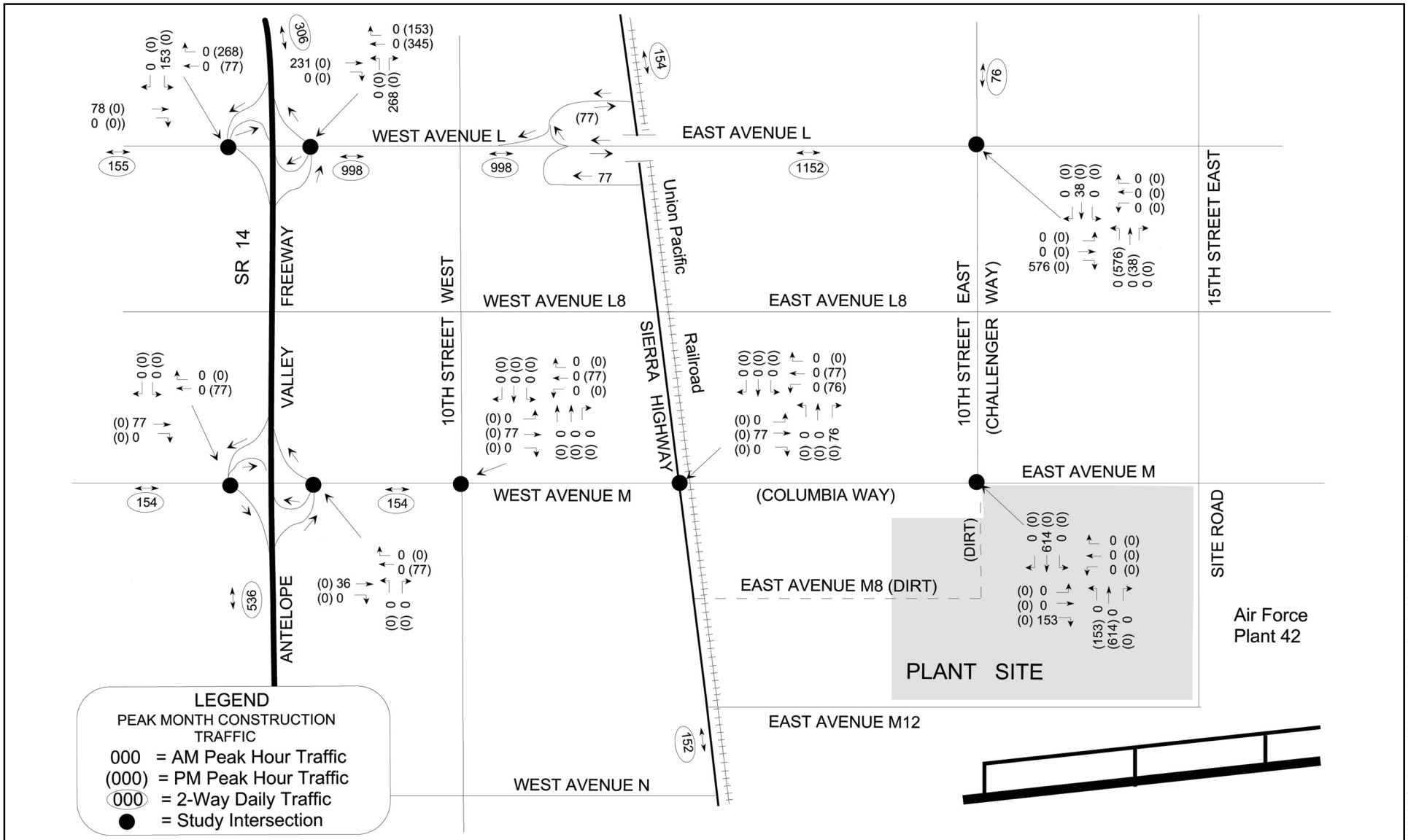

Map Location

Not to Scale
Data Source: Wilson Engineering 2008

Palmdale Hybrid Power Project

Figure 5.13-4

Peak Month Project Construction Traffic

PALMDALE a place to call home
Inland Energy, Inc.
ENSR | AECOM

Project: 10855-002
Date: June 2008

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Map Location

Not to Scale
Source: Wilson Engineering 2008

Palmdale Hybrid Power Project

Figure 5.13-5

Project Operations Related Traffic

PALMDALE
a place to call home
Inland Energy, Inc.
ENSR | AECOM

Project: 10855-002
Date: June 2008

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