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April 18, 2013

PG&E Letter DCL-13-039

Mr. Ron Alsop
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San Luis Obispo County
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County Government Center, D-430
San Luis Obispo, CA 93408

Diablo Canyon Units 1 and 2
Evacuation Time Estimate Study – Diablo Canyon Power Plant Development of Evacuation Time Estimates for Each Protective Action Zone

Dear Mr. Alsop:

On December 12, 2012, Pacific Gas and Electric Company (PG&E) submitted PG&E letter DCL-12-128, "Evacuation Time Estimate Study - Diablo Canyon Power Plant Emergency Planning Zone Evacuation Time Estimate [ETE]," to the Nuclear Regulatory Commission (NRC). Once the NRC's review of this document is complete, PG&E will incorporate any required changes. As specified in 10 CFR 50, Appendix E, Section IV, PG&E will then send the study to San Luis Obispo County on or after June 10, 2013 (no less than 180 days from December 12, 2012), for use in developing offsite protective action strategies.

In response to San Luis Obispo County's request, PG&E is providing the DCPP ETE Protective Action Zone study, "Diablo Canyon Power Plant Development of Evacuation Time Estimates for Each Protective Action Zone," as Enclosure 1.

Please contact me at (805) 545-6300 (email: M0G3@pge.com) should you have any questions regarding this submittal.

Sincerely,

Michael A. Ginn
*Manager – Emergency Planning*

wrl8/6980/50439570
Enclosure
cc: Diablo Distribution
cc/enc: Richard Grundstrom, FEMA Region IX

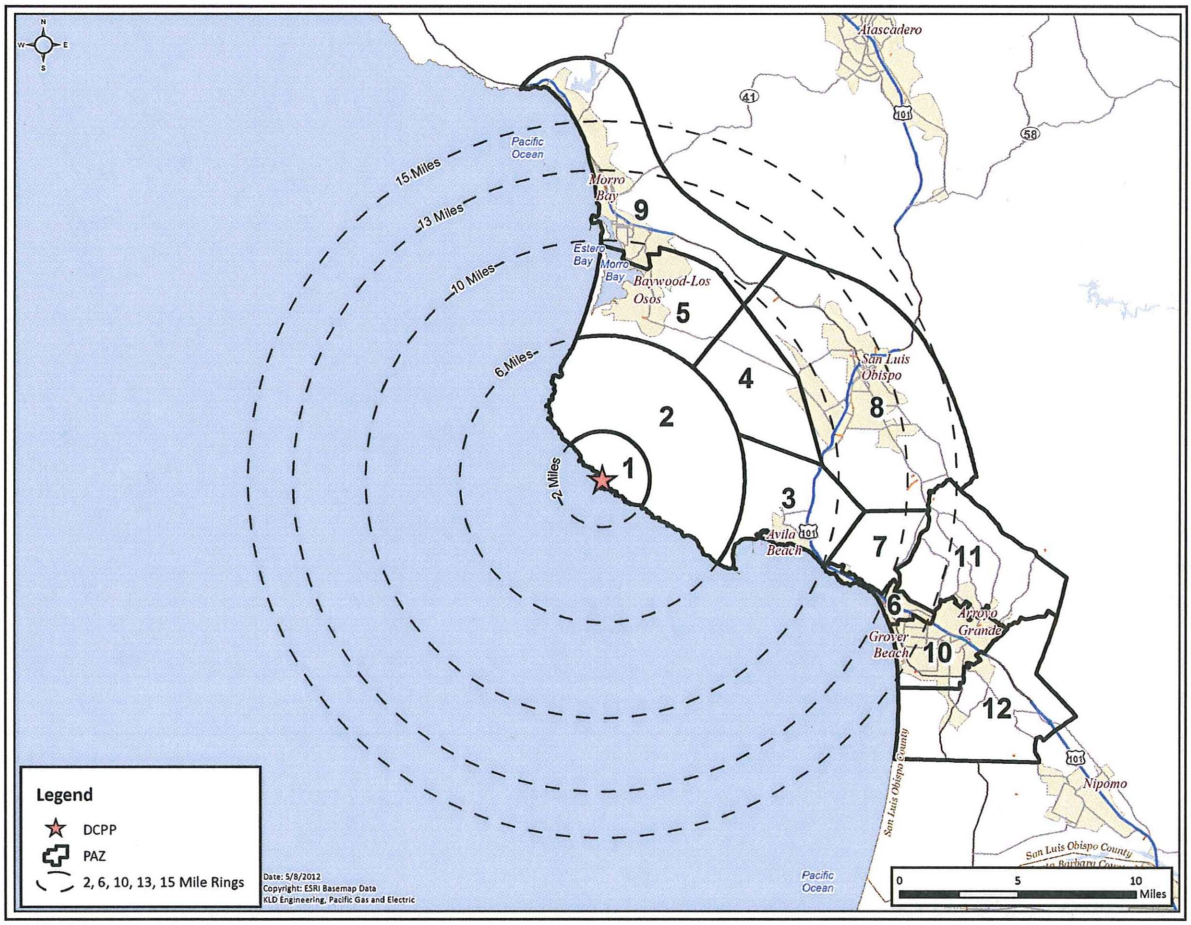
# Diablo Canyon Power Plant Development of Evacuation Time Estimates for Each Protective Action Zone

(20 pages)

KLD ENGINEERING, P.C.

# *Diablo Canyon Power Plant*

## *Development of Evacuation Time Estimates for Each Protective Action Zone*




***Work performed under contract with Contingency Management Consulting Group in support of Pacific Gas and Electric Company, by:***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## ACRONYM LIST

**Table 1. Acronym List**

| ACRONYM | DEFINITION |
|---|---|
| DCPP | Diablo Canyon Power Plant |
| EPZ | Emergency Planning Zone |
| ETE | Evacuation Time Estimate |
| HCM | Highway Capacity Manual |
| NRC | United States Nuclear Regulatory Commission |
| PAZ | Protective Action Zone |
| pcphpl | Passenger car per hour per lane |
| PG&E | Pacific Gas & Electric |
| SH | State Highway |
| SLOCOES | San Luis Obispo County Office of Emergency Services |

# 1 INTRODUCTION

The current Diablo Canyon Power Plant (DCPP) Emergency Planning Zone (EPZ) is comprised of 12 Protective Action Zones (PAZs). The *Diablo Canyon Power Plant Development of Evacuation Time Estimates* (KLD TR-498, November 2012), provided to the NRC as Enclosure 1 of PG&E Letter DCL-12-128, documents the Evacuation Time Estimates (ETE) for contiguous groups of PAZs (referred to as Evacuation Regions). These Regions were developed in accordance with the *Criteria for Development of Evacuation Times Estimate Studies*, NUREG/CR-7002.

San Luis Obispo County Office of Emergency Services (SLOCOES) indicated having ETE by each PAZ would be beneficial when making protective action decisions wherein groups of PAZs, or Regions, are evacuated immediately and then hours or days later, other PAZs are evacuated individually if projected dose exceeds protective action guidelines. This technical report summarizes the results obtained by a study to develop ETE for each PAZ of the DCPP EPZ from a nuclear evacuation perspective (evacuating radially away from the DCPP location).

In the performance of this effort, guidance is provided by documents published by Federal Governmental agencies. Most important of these are:

- Criteria for Development of Evacuation Time Estimate Studies, NUREG/CR-7002, November 2011.
- Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG 0654/FEMA REP 1, Rev. 1, November 1980.
- Analysis of Techniques for Estimating Evacuation Times for Emergency Planning Zones, NUREG/CR 1745, November 1980.
- Development of Evacuation Time Estimates for Nuclear Power Plants, NUREG/CR-6863, January 2005.
- 10CFR50, Appendix E – "Emergency Planning and Preparedness for Production and Utilization Facilities"

## 1.1 Overview of the ETE Process

The following outline presents a brief description of the work effort in chronological sequence:

1. Information Gathering:
    a. Defined the scope of work in discussions/meetings with emergency planning representatives from Pacific Gas & Electric (PG&E) and SLOCOES.
    b. Conducted a detailed field survey of the highway system and of area traffic conditions within the EPZ and Shadow Region; see Appendix K of KLD TR-498.
    c. Obtained demographic data from census, state and local agencies.

d. Conducted a random sample telephone survey of EPZ residents; see Appendix F of KLD TR-498.

2. Defined assumptions to be utilized in the development of the ETEs. The assumptions for this study are defined in Section 2 of KLD TR-498. The following assumptions used in this study deviate from those listed in Section 2 of KLD TR-498:

   a. Individual PAZs were used, rather than groups of PAZs or Regions. (Study Methodological Assumption numbers 1 and 4 in Section 2.2 of KLD TR-498.)

   b. ETE are presented in tabular format only. (Study Methodological Assumption number 2 in Section 2.2 of KLD TR-498.)

   c. As indicated in Figure 1-3, 100 percent of people within the impacted PAZ evacuate. Twenty percent of those people within the EPZ, not within the impacted PAZ will voluntarily evacuate. Twenty percent of those people within the Shadow Region will voluntarily evacuate. (Study Methodological Assumption number 5 in Section 2.2 of KLD TR-498.)

   d. A total of 10 scenarios representing different temporal variations and weather conditions are considered. Based on the county's intended use of the results of this study, the special event and roadway impact scenarios would not be applicable. (Study Methodological Assumption number 6 in Section 2.2 of KLD TR-498.)

3. Estimated distributions of trip generation times representing the time required by various population groups (permanent residents, employees, and transients) to prepare (mobilize) for the evacuation trip. These estimates are primarily based upon the random sample telephone survey. The trip generation times used in this study are the same as those used in the DCPP base EPZ ETE study; see Section 5 of KLD TR-498.

4. Defined Evacuation Scenarios. These scenarios reflect the variation in demand, in trip generation distribution and in highway capacities, associated with different seasons, day of week, time of day and weather conditions.

5. Reviewed the existing traffic management plan to be implemented by local and state law enforcement in the event of an incident at the plant. Traffic control is applied at specified Traffic Control Points located within the EPZ; see Appendix G of KLD TR-498.

6. Prepared the input streams for the DYNEV II system, the traffic simulation model used to compute ETEs; see Appendices B and C of KLD TR-498.

   a. Estimated the evacuation traffic demand, based on the available information derived from Census data, and from data provided by local and state agencies, from PG&E and from the telephone survey.

   b. Applied the procedures specified in the 2010 Highway Capacity Manual (HCM[1]) to the data acquired during the field survey, to estimate the capacity of all

[1] Highway Capacity Manual (HCM 2010), Transportation Research Board, National Research Council, 2010.

highway segments comprising the evacuation routes; see Section 4 of KLD TR-498.

c. Developed the link-node representation of the evacuation network, which is used as the basis for the computer analysis that calculates the ETE; see Appendix K of KLD TR-498.

d. Calculated the evacuating traffic demand for each PAZ and for each Scenario; see Sections 3 and 6 of KLD TR-498.

e. Specified selected candidate destinations for each "origin" (location of each "source" where evacuation trips are generated over the mobilization time) to support evacuation travel consistent with outbound movement relative to the location of the plant.

7. Executed the DYNEV II model to provide the estimates of evacuation routing and ETE for all residents, transients and employees ("general population") with access to private vehicles. Generated a complete set of ETE for all specified PAZs and Scenarios.

## 1.2 The Diablo Canyon Power Plant Location

The Diablo Canyon Power Plant is located along the shores of the Pacific Ocean in San Luis Obispo County, CA. The site is approximately 150 miles northwest of Los Angeles, CA and 200 miles south of San Francisco, CA, as shown in Figure 1-1. The EPZ is broken up into 12 PAZs which include the communities of Baywood-Los Osos and Avila Beach, and the cities of San Luis Obispo, Morro Bay, Pismo Beach, Grover Beach, and Arroyo Grande. Figure 1-2 displays the 12 PAZs and the general population (permanent residents, transients and employees) within each PAZ.

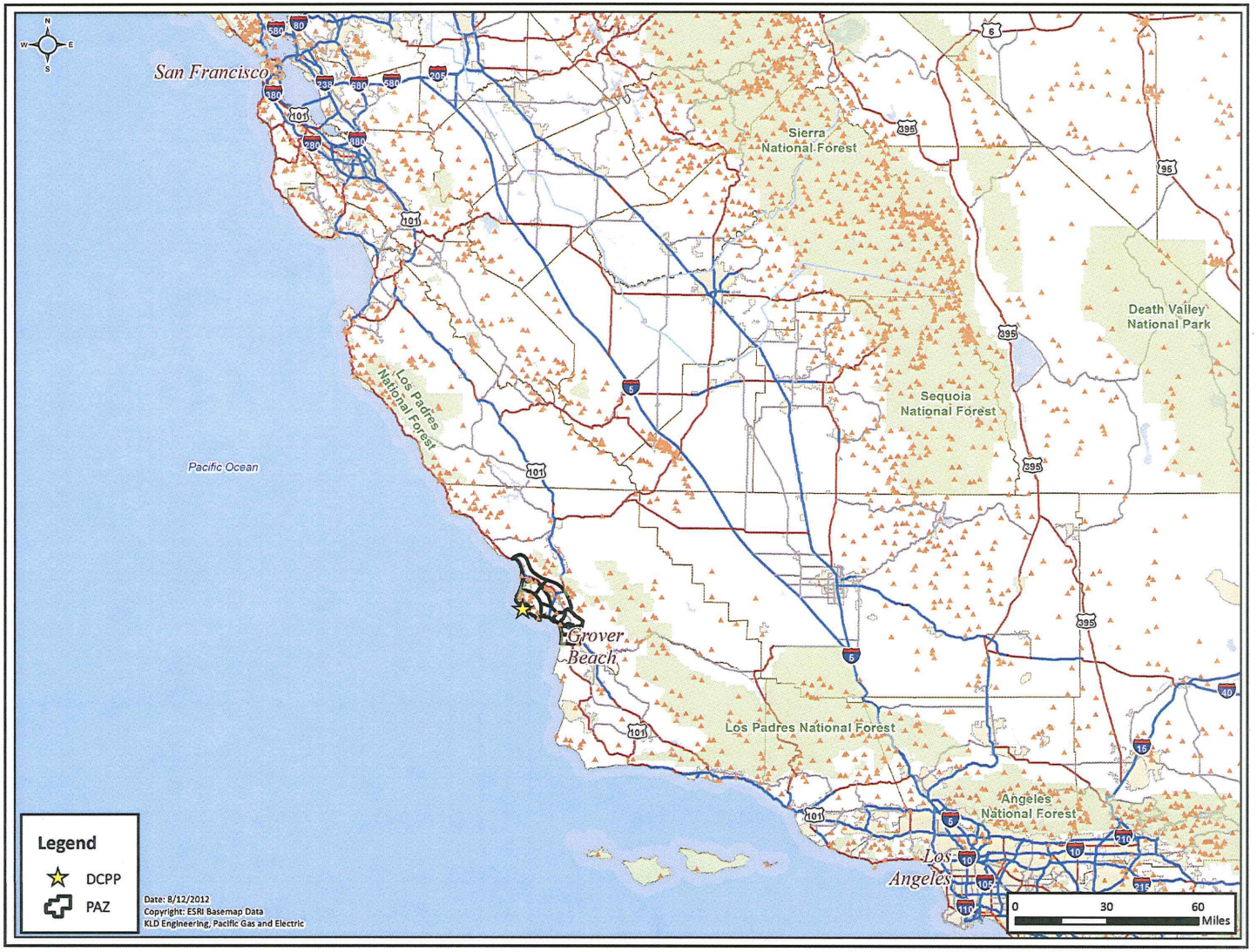
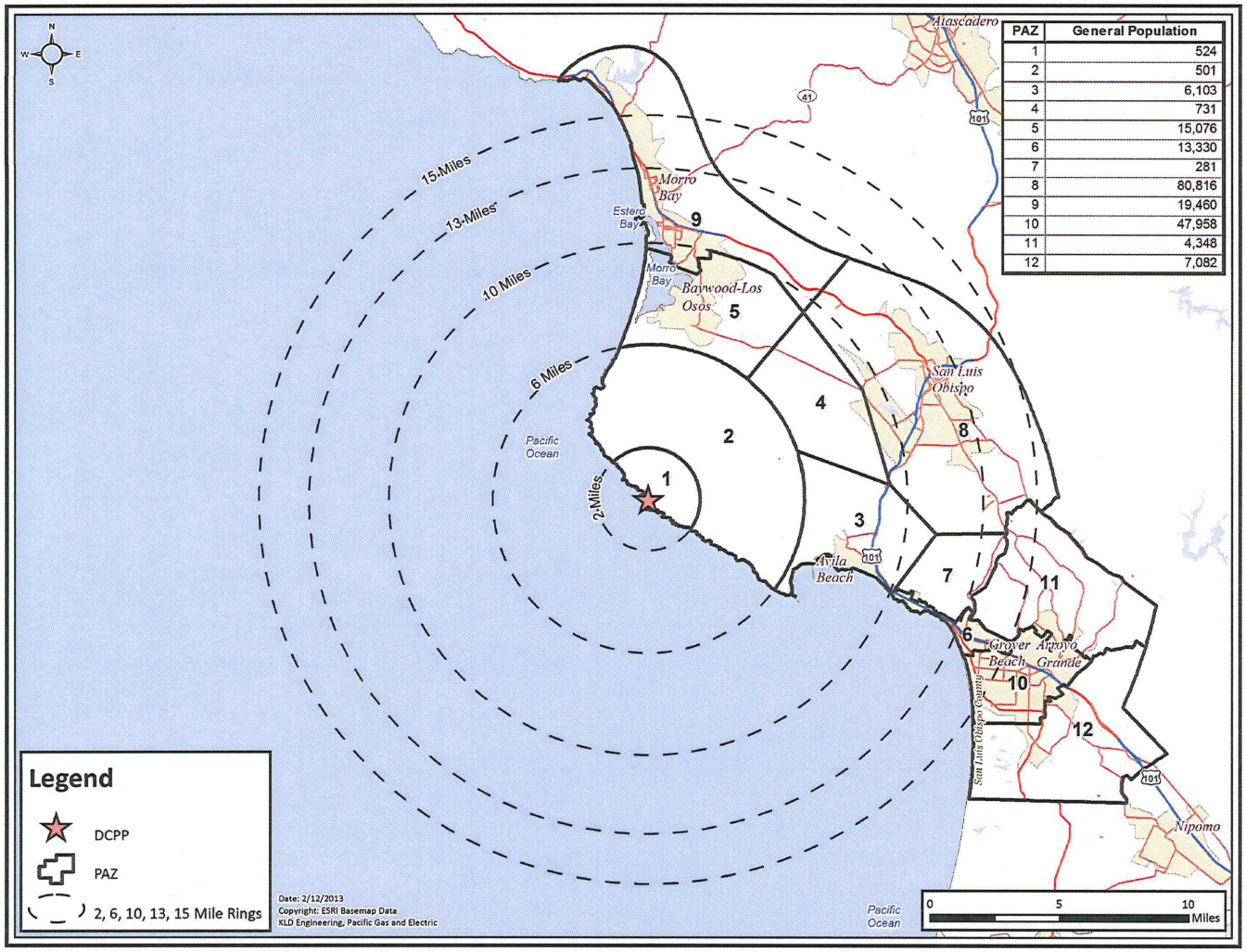



**Figure 1-1. DCPP Location**




| PAZ | General Population |
|---|---|
| 1 | 524 |
| 2 | 501 |
| 3 | 6,103 |
| 4 | 731 |
| 5 | 15,076 |
| 6 | 13,330 |
| 7 | 281 |
| 8 | 80,816 |
| 9 | 19,460 |
| 10 | 47,958 |
| 11 | 4,348 |
| 12 | 7,082 |

**Figure 1-2. DCPP EPZ PAZs and General Population**[2]

[2] General Population, shown by PAZ, is the sum of permanent residents, employees, and transients.

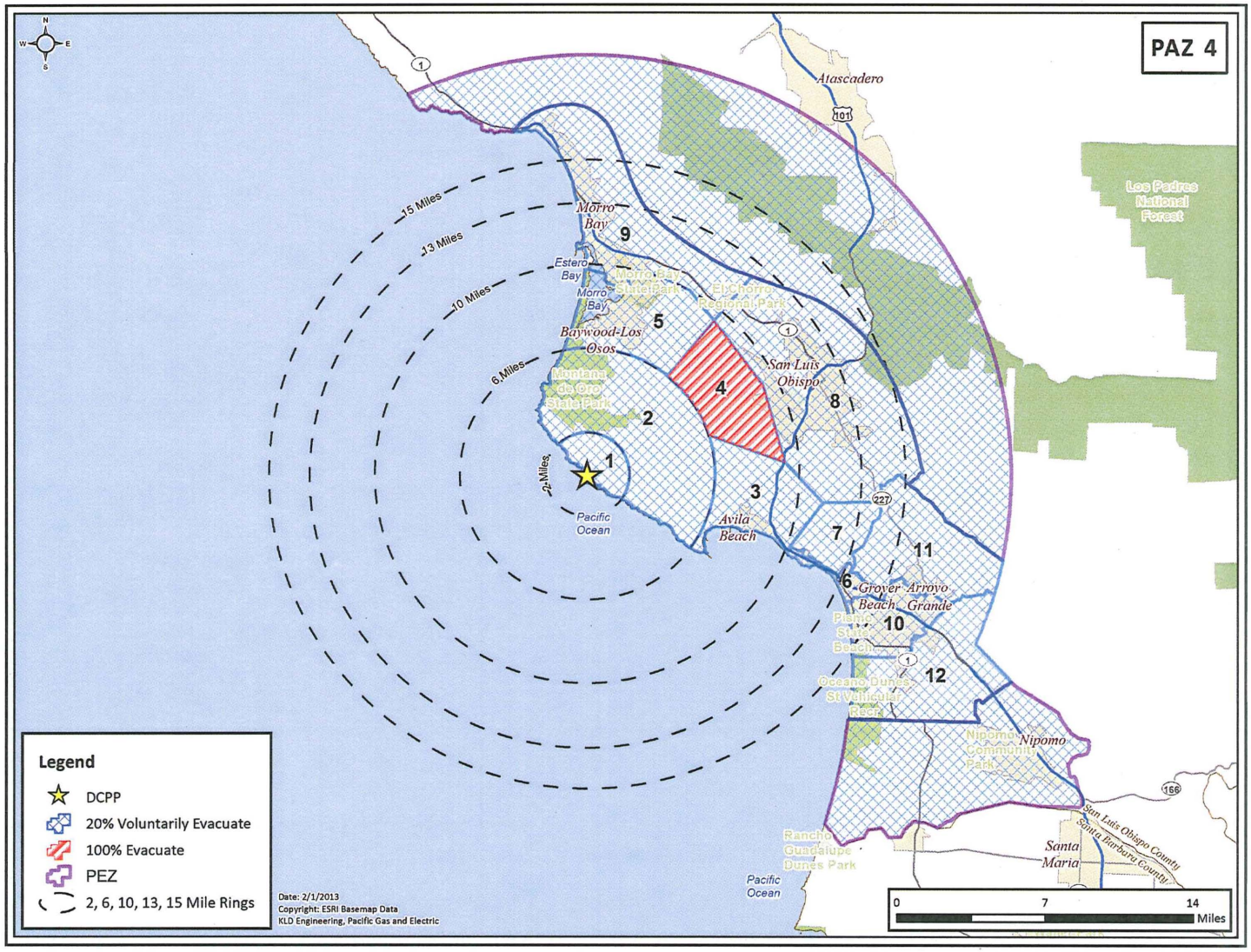



**Figure 1-3. Voluntary Evacuation Methodology**

# 2 GENERAL POPULATION EVACUATION TIME ESTIMATES (ETE)

This section presents the ETE results of the computer analyses using the DYNEV II System described in Appendices B, C and D of KLD TR-498. These results cover 12 PAZs within the DCPP EPZ and the 10 Evacuation Scenarios shown in Table 2-1. Only the non-special scenarios were used in the analysis as discussed in Section 1.

The ETE for all Evacuation Cases are presented in Table 2-2 and Table 2-3. These tables present the estimated times to clear the indicated population percentages from the PAZs for all Evacuation Scenarios from a nuclear evacuation perspective. The tabulated values of ETE are obtained from the DYNEV II System outputs which are generated at 5-minute intervals. Table 2-4 and Table 2-5 provide data in one concise table. Table 2-4 displays general population, vehicle demand and ETE by PAZ for a summer, midweek, midday scenario for good weather and rain (Scenarios 1 and 2). Table 2-5 displays general population, vehicle demand and ETE by PAZ for a winter, midweek, midday scenario for good weather and rain (Scenarios 6 and 7).

## 2.1 Methodology

It is assumed that 100 percent of the population within the PAZ being evacuated will in fact evacuate. These evacuees will use the roadways available within the PAZ to leave the PAZ traveling away from the plant. The DYNEV model counts the number of vehicles crossing the PAZ boundary over time and uses this count to determine the ETE.

"Voluntary evacuees" are people within the EPZ in PAZs for which an Evacuation Order has not been issued, yet who elect to evacuate. "Shadow evacuation" is the voluntary outward movement of some people from the Shadow Region (outside the EPZ) for whom no protective action has been ordered. Both voluntary and shadow evacuations are assumed to take place over the same time frame as the evacuation from within the impacted PAZ.

The ETE for the DCPP EPZ addresses the issue of voluntary evacuees in the manner shown in Figure 1-3 (illustrative example for the evacuation of PAZ 4 only). Within the PAZ being evacuated (PAZ 4 in this case), 100 percent of the population evacuates. Within the EPZ, 20 percent of people located in a PAZ who are not ordered to evacuate (all PAZs except PAZ 4 in this case), are assumed to elect to evacuate. Similarly, it is assumed that 20 percent of those people in the Shadow Region will choose to leave the area.

Figure 2-1 presents the area identified as the Shadow Region. This region is called the Public Education Zone. This area is defined as an area in which residents are provided with general information about Diablo Canyon, but are not likely to be affected by an emergency at the power plant. The population and number of evacuating vehicles in the Shadow Region were estimated using the same methodology that was used for permanent residents within the EPZ (see Section 3.1 of KLD TR-498). As discussed in Section 3.2 of KLD TR-498, it is estimated that a total of 23,613 people reside in the Shadow Region; 20 percent of them would evacuate.

Traffic generated within this Shadow Region, traveling away from the DCPP location, has the potential for impeding evacuating vehicles from within the evacuating PAZ. All ETE calculations include this shadow traffic movement.

## 2.2 Patterns of Traffic Congestion during Evacuation

Section 7.3 of KLD TR-498 discusses patterns of traffic congestion during an evacuation of the entire EPZ (Region R04). Figures 7-4 through 7-11 illustrate the patterns of traffic congestion that arise for the case when the entire EPZ is ordered to evacuate during the summer, midweek, midday period under good weather conditions (Scenario 1).

As shown in those figures, Oceano, Grover Beach and Arroyo Grande (located in PAZ 10) are the most congested areas in the EPZ and are the last to clear. This is due to the high population in these areas that evacuate southbound along State Highway (SH) 1 and S Halcyon Rd. SH 1 and S Halcyon Rd are single lane roads with a capacity of 1700 passenger cars per hour per lane. Immediately after exiting PAZ 10, evacuees along S Halcyon Rd merge at a signalized intersection onto SH 1 southbound. This bottleneck backs up into PAZ 10 and prolongs the evacuation of this PAZ.

## 2.3 Evacuation Time Estimate Results

Table 2-2 and Table 2-3 present the 90$^{th}$ and 100$^{th}$ percentile ETE values for all 12 PAZs and all 10 Evacuation Scenarios, respectively.

The animation snapshots described in Section 7.3 of KLD TR-498 reflect the traffic congestion patterns for the concurrent evacuation of all PAZs. PAZ 10 is the most congested PAZ due to bottlenecks along US 101 and SH 1 exiting Oceano, Grover Beach, and Arroyo Grande; this is reflected in the ETE statistics:

- The 90$^{th}$ percentile ETE range from 1 hour for PAZ 1 to 6 hours, 35 minutes for PAZ 10.
- The 100$^{th}$ percentile ETE is comparable to mobilization time (4 hours and 30 minutes) for all PAZs except PAZ 8 and PAZ 10. These PAZs have the largest populations and most congestion. The 100$^{th}$ percentile ETE for PAZ 8 and PAZ 10 are at most 8 hours, 5 minutes and 9 hours, 10 minutes, respectively. Note PAZ 1 only contains plant employees and therefore can evacuate within the 2 hour mobilization time of employees; see Section 5 (Figure 5-4) of KLD TR-498.

As seen in Figure 1-2, PAZ 8 has the largest population. The population within PAZ 8 evacuates primarily along SH 1 northbound and US 101 in both directions. Both of these major evacuation routes have two lanes exiting PAZ 8. SH 1 has a capacity of 1900 passenger cars per hour per lane (pcphpl). Additionally, US 101 is a limited access highway with a capacity of 2250 pcphpl. Once vehicles access US 101, they can move freely to exit the PAZ. SH 1 exiting PAZ 10, however, is a single lane road with a capacity of 1700 pcphpl. Higher capacity on SH 1 exiting PAZ 8 allows the larger population of PAZ 8 to evacuate more quickly than the evacuees in PAZ 10. This is reflected in Table 2-2 and Table 2-3; the ETE for PAZ 8 is shorter than the ETE for PAZ

10 for all scenarios. A similar anomaly exists at the 90th percentile for PAZs 3 and 4. PAZ 3 has a larger population but a shorter 90th percentile ETE than PAZ 4. PAZ 3 evacuates primarily along US 101 whereas PAZ 4 evacuates primarily along Los Osos Valley Rd and W Foothill Blvd. This anomaly can be seen in Table 2-2.

Several additional anomalies between scenarios exist in Table 2-2 due to population distributions and scenario percentages. These anomalies only exist for the 90th percentile ETE, not the 100th percentile ETE. For example, based on Table 6-4 of KLD TR-498, Scenario 10 would expect to produce a shorter ETE than Scenario 8 since there are fewer vehicles present in the EPZ. This is true for all PAZs except PAZs 2 and 3. It can be seen in Table 3-10 of KLD TR-498, PAZs 2 and 3 have large transient populations compared to residential populations. As shown in Table 5-8 of KLD TR-498, transients mobilize more quickly than residents. For a winter, weekend, midday scenario (Scenario 8), 65 percent of transients are present in the EPZ, and for a winter, evening scenario (Scenario 10), 37 percent of transients are present in the EPZ, as seen in Table 6-4 of KLD TR-498. Due to the large percentage of transients for Scenario 8 that mobilize quickly, the 90th percentile for Scenario 8 is shorter than the 90th percentile ETE for Scenario 10 for PAZs 2 and 3. Again, this anomaly only exists at the 90th percentile ETE, not the 100th percentile ETE.

Bottlenecks can create anomalies between scenarios in Table 2-3, as well. For example, due to the limited capacity of SH 1 exiting PAZ 10, as described above, congestion exists along SH 1 southbound prolonging ETE. This congestion worsens as more vehicles evacuate along SH 1 southbound. Most of the transient facilities in PAZ 10 are located along SH 1 west of the railroad (6,810 transients of the 7,223 total transients in PAZ 10). These transients are forced to evacuate along SH 1 southbound to exit the PAZ. Even though there are less evacuating vehicles overall for Scenario 4 than Scenario 2, the scenario percentage of transients is 100% for Scenario 4, compared to 80% for Scenario 2. This 20% increase in transient vehicles exacerbates the congestion along SH 1 southbound and prolongs ETE. As seen in Table 2-3, the 100th percentile ETE for Scenario 4 is 10 minutes longer than the 100th percentile ETE for Scenario 2 due to the increased congestion.

## 2.4 Guidance on Using ETE Tables

The user first determines the percentile of population for which the ETE is sought (The NRC guidance calls for the 90th percentile). The applicable value of ETE within the chosen table may then be identified using the following procedure:

1. Identify the applicable **Scenario**:
   - Season
     - Summer
     - Winter (includes Autumn and Spring)
   - Day of Week
     - Midweek
     - Weekend
   - Time of Day

    - Midday
    - Evening
- Weather Condition
    - Good Weather
    - Rain

While these Scenarios are designed, in aggregate, to represent conditions throughout the year, some further clarification is warranted:

- The conditions of a summer evening (either midweek or weekend) and rain are not explicitly identified in the Tables. For these conditions, Scenarios (2) and (4) apply.
- The conditions of a winter evening (either midweek or weekend) and rain are not explicitly identified in the Tables. For these conditions, Scenarios (7) and (9) for rain apply.
- The seasons are defined as follows:
    - Summer assumes that public schools are not in session.
    - Winter (includes Spring and Autumn) considers that public schools are in session.
- Time of Day: Midday implies the time over which most commuters are at work or are travelling to/from work.

2. With the desired percentile ETE and Scenario identified, now identify the desired **PAZ**.
3. Determine the **ETE Table** based on the **percentile** selected. Then, for the **Scenario** identified in Step 1 and the **PAZ** identified in Step 2, proceed as follows:
    - The columns of Table 2-2 and Table 2-3 are labeled with the Scenario numbers. Identify the proper column in the selected Table using the Scenario number defined in Step 1.
    - Identify the row in this table that provides ETE values for the PAZ identified in Step 2.
    - The unique data cell defined by the column and row so determined contains the desired value of ETE expressed in Hours:Minutes.

Example

It is desired to identify the ETE for the following conditions:

- Sunday, August 10th at 4:00 AM.
- It is raining.
- PAZ 8 is to be evacuated only.
- The desired ETE is that value needed to evacuate 90 percent of the population from within the impacted PAZ.

Table 2-2 is applicable because the 90th percentile ETE is desired. Proceed as follows:

1. Identify the Scenario as summer, weekend, evening and raining. Entering Table 2-1, it is seen that there is no match for these descriptors. However, the clarification given above assigns this combination of circumstances to Scenario 4.
2. Enter Table 2-2 to locate the data cell containing the value of ETE for Scenario 4 and PAZ 8. This data cell is in column (4) and in the row for PAZ 8; it contains the ETE value of 5:00.

**Table 2-1. Evacuation Scenarios**

| Scenarios[1] | Season[2] | Day of Week | Time of Day | Weather |
|---|---|---|---|---|
| 1 | Summer | Midweek | Midday | Good |
| 2 | Summer | Midweek | Midday | Rain |
| 3 | Summer | Weekend | Midday | Good |
| 4 | Summer | Weekend | Midday | Rain |
| 5 | Summer | Midweek, Weekend | Evening | Good |
| 6 | Winter | Midweek | Midday | Good |
| 7 | Winter | Midweek | Midday | Rain |
| 8 | Winter | Weekend | Midday | Good |
| 9 | Winter | Weekend | Midday | Rain |
| 10 | Winter | Midweek, Weekend | Evening | Good |

[1] Only the non-special scenarios from KLD TR-498 were used in this study.

[2] Winter assumes that school is in session (also applies to spring and autumn). Summer assumes that school is not in session.

Table 2-2. Time to Clear the Indicated Area of *90* Percent of the Affected Population

| | Summer | | Summer | | Summer | Winter | | Winter | | Winter |
|---|---|---|---|---|---|---|---|---|---|---|
| | Midweek | | Weekend | | Midweek Weekend | Midweek | | Weekend | | Midweek Weekend |
| Scenario: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| PAZ | Midday | | Midday | | Evening | Midday | | Midday | | Evening |
| | Good Weather | Rain | Good Weather | Rain | Good Weather | Good Weather | Rain | Good Weather | Rain | Good Weather |
| 1 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 | 1:00 |
| 2 | 1:15 | 1:15 | 1:10 | 1:10 | 1:20 | 1:20 | 1:20 | 1:15 | 1:15 | 1:25 |
| 3 | 1:35 | 2:00 | 1:30 | 1:40 | 1:30 | 1:40 | 1:50 | 1:30 | 1:35 | 1:35 |
| 4 | 2:00 | 2:00 | 1:55 | 1:55 | 1:55 | 2:00 | 2:00 | 1:55 | 1:55 | 1:55 |
| 5 | 2:50 | 3:10 | 2:45 | 3:00 | 2:45 | 2:50 | 3:10 | 2:45 | 3:00 | 2:45 |
| 6 | 2:15 | 2:30 | 2:00 | 2:15 | 1:55 | 2:15 | 2:25 | 1:55 | 2:15 | 1:55 |
| 7 | 1:55 | 1:55 | 1:50 | 1:50 | 1:50 | 1:55 | 1:55 | 1:55 | 1:55 | 1:55 |
| 8 | 5:05 | 6:05 | 4:20 | 5:00 | 3:50 | 5:05 | 5:50 | 4:10 | 5:00 | 3:40 |
| 9 | 3:10 | 3:40 | 3:00 | 3:15 | 2:50 | 3:00 | 3:20 | 2:50 | 3:05 | 2:45 |
| 10 | 6:05 | 6:30 | 5:55 | 6:35 | 5:05 | 5:25 | 6:00 | 5:10 | 5:45 | 4:35 |
| 11 | 2:25 | 2:25 | 2:15 | 2:15 | 2:05 | 2:30 | 2:30 | 2:10 | 2:15 | 2:00 |
| 12 | 3:15 | 3:25 | 3:10 | 3:25 | 3:00 | 3:05 | 3:20 | 3:00 | 3:15 | 2:55 |

**Note: Times shown are only applicable when individual PAZ is evacuated.**

**For the evacuation of multiple PAZs, see Table 7-1 of KLD TR-498.**

**Table 2-3. Time to Clear the Indicated Area of *100* Percent of the Affected Population**

| | Summer | | Summer | | Summer | Winter | | Winter | | Winter |
|---|---|---|---|---|---|---|---|---|---|---|
| | Midweek | | Weekend | | Midweek Weekend | Midweek | | Weekend | | Midweek Weekend |
| Scenario: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| PAZ | Midday | | Midday | | Evening | Midday | | Midday | | Evening |
| | Good Weather | Rain | Good Weather | Rain | Good Weather | Good Weather | Rain | Good Weather | Rain | Good Weather |
| 1 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 | 2:00 |
| 2 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 3 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 4 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 5 | 4:30 | 4:35 | 4:30 | 4:30 | 4:30 | 4:35 | 4:35 | 4:30 | 4:30 | 4:30 |
| 6 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 7 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 8 | 7:00 | 8:05 | 5:55 | 6:45 | 5:20 | 7:10 | 7:55 | 5:50 | 6:30 | 5:15 |
| 9 | 4:30 | 4:35 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 10 | 8:20 | 9:00 | 8:15 | 9:10 | 7:00 | 7:35 | 8:20 | 7:10 | 8:00 | 6:20 |
| 11 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 | 4:30 |
| 12 | 4:30 | 4:45 | 4:30 | 4:45 | 4:30 | 4:30 | 4:35 | 4:30 | 4:30 | 4:30 |

**Note: Times shown are only applicable when individual PAZ is evacuated.**

**For the evacuation of multiple PAZs, see Table 7-2 of KLD TR-498.**

Table 2-4. General Population and Vehicle Demand and ETE by PAZ for a Summer, Midweek, Midday Scenario

| PAZ | Description | Residents | Transients | Employees | Total Population | Resident Vehicles | Transient Vehicles | Employee Vehicles | Total Vehicles | ETE - Good Weather (hr:min) | | ETE - Rain (hr:min) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 90% | 100% | 90% | 100% |
| 1 | 2-Mile | 0 | 0 | 503 | **503** | 0 | 0 | 466 | **466** | 1:00 | 2:00 | 1:00 | 2:00 |
| 2 | 6-Mile | 168 | 266 | 0 | **434** | 96 | 161 | 0 | **257** | 1:15 | 4:30 | 1:15 | 4:30 |
| 3 | Avila/San Luis/See Canyon/Squire Canyon | 2,736 | 2,624 | 84 | **5,444** | 1,548 | 1,130 | 77 | **2,755** | 1:35 | 4:30 | 2:00 | 4:30 |
| 4 | Perfumo Canyon/Los Osos Valley | 713 | 0 | 17 | **730** | 406 | 0 | 16 | **422** | 2:00 | 4:30 | 2:00 | 4:30 |
| 5 | Baywood/Los Osos | 14,217 | 390 | 356 | **14,964** | 8,040 | 142 | 332 | **8,514** | 2:50 | 4:30 | 3:10 | 4:35 |
| 6 | City of Pismo Beach | 6,562 | 4,618 | 955 | **12,136** | 3,709 | 1,966 | 883 | **6,558** | 2:15 | 4:30 | 2:30 | 4:30 |
| 7 | Indian Knob/Price Canyon | 281 | 0 | 0 | **281** | 158 | 0 | 0 | **158** | 1:55 | 4:30 | 1:55 | 4:30 |
| 8 | San Luis Obispo Area | 60,962 | 6,501 | 11,259 | **78,722** | 31,010 | 2,800 | 10,423 | **44,233** | 5:05 | 7:00 | 6:05 | 8:05 |
| 9 | Morro Bay/Cayucos | 13,126 | 4,403 | 797 | **18,326** | 7,420 | 1,982 | 738 | **10,140** | 3:10 | 4:30 | 3:40 | 4:35 |
| 10 | Five Cities, Southern Portion | 37,476 | 5,778 | 3,129 | **46,383** | 21,186 | 3,685 | 2,896 | **27,767** | 6:05 | 8:20 | 6:30 | 9:00 |
| 11 | Orcutt Road/Lopez Drive/Route 227 | 4,205 | 33 | 98 | **4,336** | 2,379 | 14 | 91 | **2,484** | 2:25 | 4:30 | 2:25 | 4:30 |
| 12 | Nipomo North of Willow Rd | 6,775 | 134 | 134 | **7,043** | 3,830 | 58 | 125 | **4,013** | 3:15 | 4:30 | 3:25 | 4:45 |
| | Total | **147,221** | **24,748** | **17,332** | **189,301** | **79,782** | **11,937** | **16,047** | **107,766** | | | | |

**Note: Times shown are only applicable when individual PAZ is evacuated.**

**For the evacuation of multiple PAZs, see Table 7-1 and Table 7-2 of KLD TR-498 for the 90th and 100th percentile ETE, respectively.**

Table 2-5. General Population and Vehicle Demand and ETE by PAZ for a Winter, Midweek, Midday Scenario

| PAZ | Description | Residents | Transients | Employees | Total Population | Resident Vehicles | Transient Vehicles | Employee Vehicles | Total Vehicles | ETE - Good Weather (hr:min) | | ETE - Rain (hr:min) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 90% | 100% | 90% | 100% |
| 1 | 2-Mile | 0 | 0 | 524 | **524** | 0 | 0 | 485 | **485** | **1:00** | **2:00** | **1:00** | **2:00** |
| 2 | 6-Mile | 168 | 167 | 0 | **335** | 96 | 101 | 0 | **197** | **1:20** | **4:30** | **1:20** | **4:30** |
| 3 | Avila/San Luis/See Canyon/Squire Canyon | 2,736 | 1,640 | 87 | **4,463** | 1,548 | 707 | 80 | **2,335** | **1:40** | **4:30** | **1:50** | **4:30** |
| 4 | Perfumo Canyon/Los Osos Valley | 713 | 0 | 18 | **731** | 406 | 0 | 17 | **423** | **2:00** | **4:30** | **2:00** | **4:30** |
| 5 | Baywood/Los Osos | 14,217 | 244 | 371 | **14,832** | 8,040 | 89 | 346 | **8,475** | **2:50** | **4:35** | **3:10** | **4:35** |
| 6 | City of Pismo Beach | 6,562 | 2,887 | 995 | **10,444** | 3,709 | 1,229 | 920 | **5,858** | **2:15** | **4:30** | **2:25** | **4:30** |
| 7 | Indian Knob/Price Canyon | 281 | 0 | 0 | **281** | 158 | 0 | 0 | **158** | **1:55** | **4:30** | **1:55** | **4:30** |
| 8 | San Luis Obispo Area | 60,962 | 4,063 | 11,728 | **76,753** | 31,010 | 1,750 | 10,857 | **43,617** | **5:05** | **7:10** | **5:50** | **7:55** |
| 9 | Morro Bay/Cayucos | 13,126 | 2,752 | 830 | **16,708** | 7,420 | 1,239 | 769 | **9,428** | **3:00** | **4:30** | **3:20** | **4:30** |
| 10 | Five Cities, Southern Portion | 37,476 | 3,612 | 3,259 | **44,347** | 21,186 | 2,303 | 3,017 | **26,506** | **5:25** | **7:35** | **6:00** | **8:20** |
| 11 | Orcutt Road/Lopez Drive/Route 227 | 4,205 | 21 | 102 | **4,328** | 2,379 | 9 | 95 | **2,483** | **2:30** | **4:30** | **2:30** | **4:30** |
| 12 | Nipomo North of Willow Rd | 6,775 | 84 | 140 | **6,999** | 3,830 | 37 | 130 | **3,997** | **3:05** | **4:30** | **3:20** | **4:35** |
| | **Total** | **147,221** | **15,468** | **18,054** | **180,743** | **79,782** | **7,461** | **16,716** | **103,959** | | | | |

**Note: Times shown are only applicable when individual PAZ is evacuated.**

**For the evacuation of multiple PAZs, see Table 7-1 and Table 7-2 of KLD TR-498 for the 90th and 100th percentile ETE, respectively.**

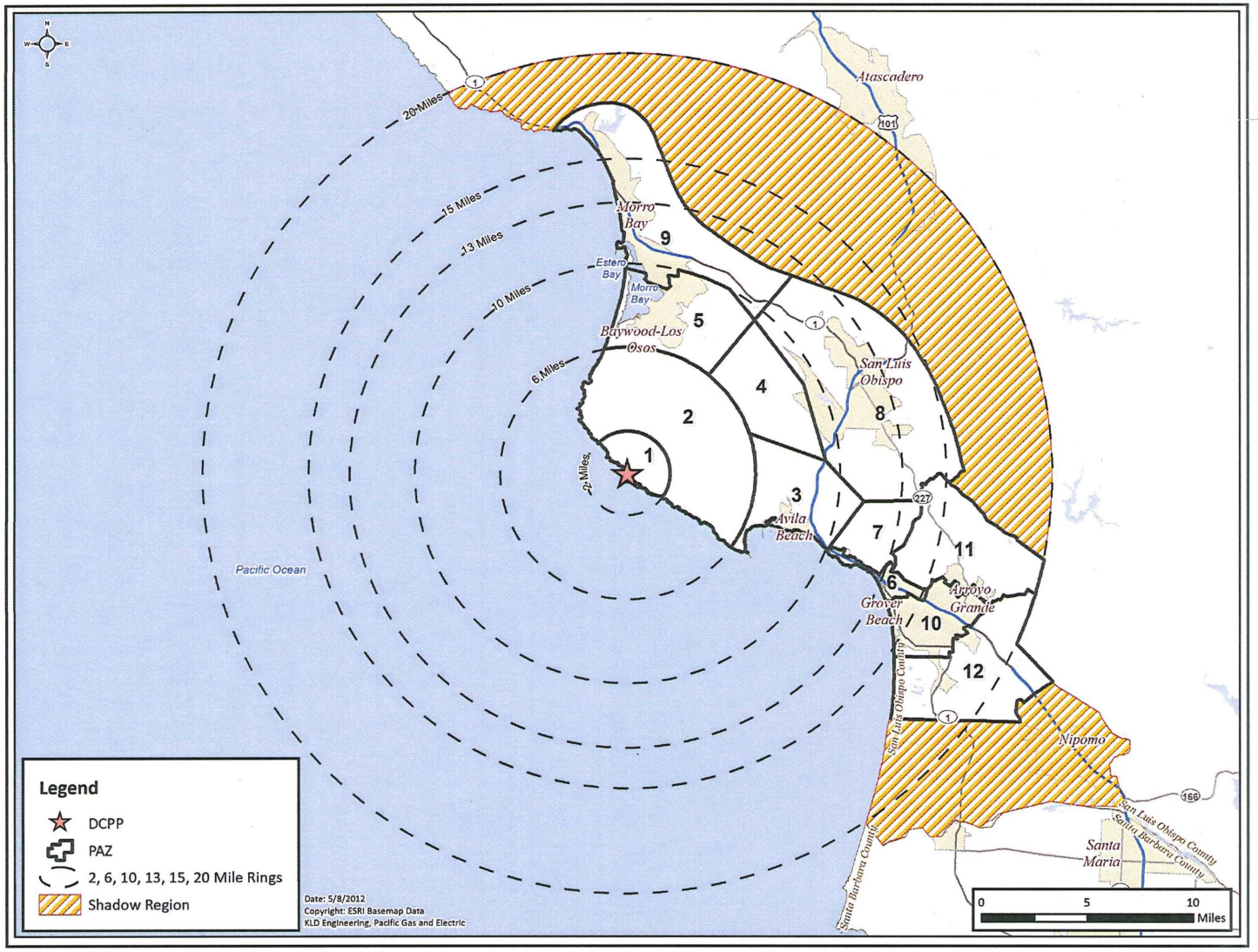



**Figure 2-1. DCPP Shadow Region**