

# Cumulative Impacts Analysis Protocol

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Potential cumulative air quality impacts are not expected to occur or result from the Palen Solar Energy Generating System Project (PSEGS) due to the following; (1) the low emissions from PSEGS, (2) the low predicted impacts, and (3) the lack of any major sources within an 6 mile radius of the site. A cumulative analysis is not warranted at this time. If such an analysis is deemed necessary, the cumulative impacts will be evaluated as follows.

## Regional Impacts

Regional air quality impacts are possible for pollutants such as ozone, which involve photochemical processes that can take hours to occur. PSEGS is required, per the SCAQMD NSR Rule to supply emissions mitigation (see Appendix 4.1G), and in addition, mitigation for some other pollutants may be required by the CEC.

Although the relative importance of VOC and NO<sub>x</sub> emissions in ozone formation differs from region to region, and from day to day, most air pollution control plans in California require roughly equivalent controls (on a ton per year basis) for these two pollutants. The change in emissions of the sum of these pollutants, equally weighted, will be used to provide a reasonable estimate of the impact of PSEGS on ozone levels. The net change in emissions of ozone precursors from PSEGS will be compared with emissions from all sources within the SCAQMD (Table 4.1H-1).

Table 4.1H-1 Estimated SCAQMD Emissions Inventory for 2010 (tons/day)

Source Category	TOG	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Total Stationary Sources	210.9	111.3	47.2	56.5	18.2	24.9	15.6
Total Area Sources	235.2	149.3	113.7	23.6	0.9	241.0	56.1
Total Mobile Sources	368.6	335.7	2878.2	755.8	39.5	48.2	38.6
Total Natural Sources	110.5	94.7	178.8	5.4	1.7	18.1	15.3
AQMD Total (tons/day)	925.1	690.9	3217.8	841.3	60.2	332.1	125.7
AQMD Total (tons/yr)	337662	252179	1174497	307075	21973	121217	45881

Source: CARB, 11/2012.

Air quality impacts of fine particulate, PM<sub>10</sub> and/or PM<sub>2.5</sub>, have the potential to be either regional or localized in nature. On a regional basis, an analysis similar to that proposed above for ozone will be performed, looking at the three pollutants that can form PM<sub>10</sub> in the atmosphere, i.e., VOC, SO<sub>x</sub>, and NO<sub>x</sub>, as well as directly emitted particulate matter. SCAQMD regulations require offsets to be provided for PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, and VOC emissions at a threshold of 4 tons per year, and CO offsets at a threshold level of 29 tons per year.

As in the case of ozone precursors, emissions of PM<sub>10/2.5</sub> precursors are expected to have approximately equivalent ambient impacts in forming PM<sub>10/2.5</sub>, per ton of emissions on a regional basis. Table 4.1H-2 provides the comparison of emissions of the criteria pollutants from PSEGS with emissions from all sources within SCAQMD as a whole.

Table 4.1H-2 Comparison of PSEGS Emissions to Estimated Inventory for 2010

Category	TOG	ROG <sup>1</sup>	CO	NOx	SOx	PM10	PM2.5
PSEGS Emissions (tons/yr)	-	2.88	10.56	4.55	1.02	1.92	1.92
SCAQMD Total (tons/yr)	337662	252179	1174497	307075	21973	121217	45881
<b>PSEGS % of AQMD Total (basis Tons/yr)</b>	-	<b>0.00114</b>	<b>0.0009</b>	<b>0.0015</b>	<b>0.0046</b>	<b>0.0016</b>	<b>0.0042</b>

<sup>1</sup> PSEG VOC emissions compared to inventory ROG emissions.

## Localized Impacts

Localized impacts from PSEGS could result from emissions of carbon monoxide, oxides of nitrogen, sulfur oxides, and directly emitted PM<sub>10</sub>. A dispersion modeling analysis of potential cumulative air quality impacts will be performed for all four of these pollutants.

In evaluating the potential cumulative localized impacts of PSEGS in conjunction with the impacts of existing facilities and facilities not yet in operation but that are reasonably foreseeable, a potential impact area in which cumulative localized impacts could occur was identified as an area with a radius of 8 miles around the plant site. Based on the results of the proposed air quality modeling analyses described above, “significant” air quality impacts, as that term is defined in federal air quality modeling guidelines, will be determined. If the project’s impacts do not exceed the significance levels, no cumulative impacts will be expected to occur, and no further analysis will be required. Otherwise, in order to ensure that other projects that might have significant cumulative impacts in conjunction with PSEGS are identified, a search area with a radius of 6 miles beyond the project’s impact area will be used for the cumulative impacts analysis. Within this search area, three categories of projects with emissions sources will be used as criteria for identification:

- Projects that have been in operation for a sufficient time period, and whose emissions are included in the overall background air quality assessment.
- Projects which recently began operations whose emissions may not be reflected in the ambient monitoring background data.
- Projects for which air pollution permits to construct have not been issued, but that are reasonably foreseeable.

The applicable inclusion dates for each of the above source categories will be discussed and approved by the SCAQMD staff. The requested source listings will incorporate these dates. Projects that are existing, and that have been in operation such that their emissions are reflected in the ambient air quality data that has been used to represent background concentrations require no further analysis. The cumulative impacts analysis adds the

modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account.

Projects for which air pollution permits to construct have been issued but that were not operational will be identified through a request of permit records from the SCAQMD. The search will be requested to be performed at two levels. For permits that are considered “major modifications” (i.e., emissions increases greater than 40 tons/year of NO<sub>x</sub> or SO<sub>2</sub>, 25 tons/year of total suspended particulate, 15 tons/year of PM<sub>10</sub>), a region within 6 miles of the proposed project site will be evaluated. For projects that had smaller emissions changes, but still greater than 15 tons/year, a region within 6 miles of the proposed project site will also be evaluated. Projects that satisfy either of these criteria and that had a permit to construct issued after the applicable inclusion date, will be included in the cumulative air quality impacts analysis. The inclusion date, as noted above, will be selected based on the typical length of time a permit to construct is valid and typical project construction times, to ensure that projects that are not reflected in the current ambient air quality data are included in the analysis. Projects for which the emissions change was smaller than 15 tons/year will be assumed to be *de minimus*, and will not be included in the dispersion modeling analysis.

A list of projects within the project region meeting the above noted criteria will be requested from the SCAQMD staff if it is determined that a cumulative analysis is warranted.

Given the potentially wide geographic area over which the dispersion modeling analysis is to be performed, the Aermid model will be used to evaluate cumulative localized air quality impacts. The detailed modeling procedures, Aermid options, and meteorological data used in the cumulative impacts dispersion analysis were the same as those described in Section 4.1. The receptor grid will be spaced at 100 meters and cover the area in which the detailed modeling analysis (described above) indicates that the project will have impacts that may exceed any significance levels.

## Cumulative Impacts Dispersion Modeling

The dispersion modeling analysis of cumulative localized air quality impacts for the proposed project will be evaluated in combination with other reasonably foreseeable projects and air quality levels attributable to existing emission sources, and the impacts were compared to state or federal air quality standards for significant impact. As discussed above, the highest second-highest modeled concentrations will be used to demonstrate compliance with standards based on short-term averaging periods (24 hours or less).

Supporting information to be used in the analysis includes the following:

- 2010 estimated emissions inventory for SCAQMD (Table 4.1H-1);
- List of projects resulting from the screening analysis of permit files by the SCAQMD;
- Table delineating location data of sources included in the cumulative air quality impacts dispersion modeling analysis;
- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis; and
- Output files for the dispersion modeling analysis.