

## DOCKETED

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April 22, 2016



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Kerby E. Zozula  
Manager, Engineering Division  
Ventura County Air Pollution Control District  
669 County Square Drive, 2nd Floor  
Ventura, CA 93003

Re: Response to Sierra Club Concerns with Use of ADJ\_U\* Option  
Puente Power Project

Dear Mr. Zozula:

On behalf of NRG Oxnard Energy Center, LLC (Applicant), Sierra Research is providing the following information in response to the April 11, 2016 letter from the Sierra Club, Environmental Coalition of Ventura County, and Environmental Defense Center (“Sierra Club”), in which they express concerns with the modeling approach used for evaluating potential ambient air quality impacts for the Puente Power Project (P3 or Project). The Sierra Club letter reflects several fundamental errors and misunderstandings that need to be corrected.

The specific issue raised by Sierra Club is the use of the ADJ\_U\* option in AERMET. The purpose of this option is to improve the performance of AERMOD (which uses meteorological data sets processed using AERMET) under stable, low wind speed conditions. Sierra Club asserts that modeling using the ADJ\_U\* option is “less accurate” than modeling performed with the “standard model” and “improperly underestimates air quality impacts.” These assertions are contrary to the findings of the U.S. Environmental Protection Agency (EPA) and others<sup>1,2,3</sup> who have evaluated the performance of the ADJ\_U\* option in AERMET in numerous studies. As a result of these studies, EPA has proposed to adopt the Beta ADJ\_U\* option as an approved default option in AERMET:

*Based on studies presented and discussed at the Tenth Modeling Conference, and additional relevant research since 2010, the EPA and other researchers have conducted additional model evaluations and developed changes to the model*

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<sup>1</sup> Qian, W., and A. Venkatram, 2011: “Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions,” *Boundary Layer Meteorology*, 138:475-491.

<sup>2</sup> AECOM, “AERMOD Low Wind Speed Evaluation with Tall-Stack Databases,” presented at EPA’s 11<sup>th</sup> Modeling Conference, August 12, 2015.

<sup>3</sup> ERM, “Comments on two of EPA’s proposed changes to the Guideline on Air Quality Models (Appendix W),” prepared for the Utility Air Regulatory Group, October 2015; available at <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2015-0310-0124&attachmentNumber=1&disposition=attachment&contentType=pdf>.

*formulation of the AERMOD modeling system to improve model performance in its regulatory applications. We propose the following updates to the AERMOD modeling system to address a number of technical concerns expressed by stakeholders:*

*1. A proposed option incorporated in AERMET to adjust the surface friction velocity ( $u^*$ ) to address issues with AERMOD model overprediction under stable, low wind speed conditions. This proposed option is selected by the user with the METHOD STABLEBL ADJ\_U\* record in the AERMET Stage 3 input file.*<sup>4</sup>

[emphasis added]

Contrary to Sierra Club's assertions, EPA and others have determined that the standard model formulation (i.e., the model formulation advocated by Sierra Club) overpredicts impacts and that the ADJ\_U\* adjustment improves model performance.<sup>5</sup>

The modeling review for the Project is being done by the San Joaquin Valley Air Pollution Control District (SJVAPCD) under contract to the Ventura County Air Pollution Control District (VCAPCD). The SJVAPCD modeling staff is among the most experienced in the state, with extensive experience in performing and reviewing ambient air quality modeling analyses for gas turbine power plants and other large, complex industrial projects, in developing statewide modeling guidance, and in processing and evaluating meteorological datasets.

The modeling analysis submitted to the VCAPCD and SJVAPCD was carried out in accordance with modeling guidance issued by the SJVAPCD.<sup>6</sup> The Applicant submitted a proposed air quality modeling protocol to the VCAPCD and SJVAPCD on December 23, 2014; the protocol was revised in February 2015 in response to comments provided by the VCAPCD, SJVAPCD, and the California Energy Commission (CEC). The Applicant clearly identified the ADJ\_U\* modeling option in both versions of the protocol. The protocol was reviewed by both the SJVAPCD modeling group and the staff of the CEC, and all of the agencies' comments were addressed in the final protocol. The SJVAPCD comments (attached) explicitly concur in the use of ADJ\_U\*. Thus, as required, the Applicant sought and received approval from the VCAPCD, SJVAPCD, and CEC for its modeling procedures, including the use of ADJ\_U\*.

The SJVAPCD prepared and provided the meteorological dataset that was used in the modeling analysis performed for the P3; the SJVAPCD-processed meteorological dataset incorporated the ADJ\_U\* option. It is the SJVAPCD modeling group's professional

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<sup>4</sup> 80 FR 45340, July 29, 2015, available at <https://www3.epa.gov/ttn/scram/11thmodconf/EPA-HQ-OAR-2015-0310-0001.pdf>.

<sup>5</sup> We also note that EPA has also approved the use of ADJ\_U\* in assessing the air quality impacts of projects, most recently the Donlin Mine project in Region 10. (See, for example, <https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=16-X-01.>)

<sup>6</sup> SJVAPCD, "Guidance for Air Dispersion Modeling," Rev 1.2, August 2006; available at [http://www.valleyair.org/busind/pto/tox\\_resources/Modeling%20Guidance.pdf](http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf).

opinion (and the Applicant agrees) that the use of ADJ\_U\* is appropriate, as indicated on its website:

*All meteorological data sets have been compiled from one-minute data using AERMINUTE with a wind speed threshold of 0.50 m/s. AERMET adjusted Friction Velocity (u\*). In AERMOD, the non-default option of 'Adjusted Friction Velocity (u\*) in AERMET (ADJ\_U\*)' **must be used...**<sup>7</sup> [emphasis added]*

An application for an Authority to Construct (ATC)/Determination of Compliance (DOC) for the P3, which included the modeling protocol and air quality impact assessment, was submitted to the VCAPCD and SJVAPCD on March 19, 2015. As noted by the Sierra Club, the Application for Certification (AFC), which also included the modeling protocol and the ambient air quality impact assessment performed by the Applicant, was filed in April 2015. Consistent with the approved protocols, the modeling analysis that was included in both applications used the ADJ\_U\* option. The VCAPCD determined the application for an ATC to be complete on June 11, 2015, over nine months ago. Sierra Club petitioned to intervene in the CEC proceedings on June 25, 2015, and was granted party status on July 17, 2015. It is not clear why the Sierra Club waited so long to raise this objection to the modeling analysis, since the analysis has been in the public record for over a year and Sierra Club has been a party to the proceedings for over nine months.

In summary, the Applicant sought and obtained reviewing agency approval for the use of the ADJ\_U\* option prior to performing the air quality modeling analysis for the P3 that was submitted over a year ago. The use of the ADJ\_U\* option is supported by numerous technical studies, which demonstrate that the use of this option improves model performance. Finally, the modeling analyses prepared by the Applicant are based on numerous conservative analysis assumptions and procedures—maximum allowable emission rates, project operating schedules that lead to maximum emissions, worst-case meteorological conditions, and the worst-observed existing air quality added to the highest potential ground-level impact from modeling— even when all of these situations could not physically occur at the same time. For these reasons, we do not believe that our use of the ADJ\_U\* option in the air quality modeling analysis for the P3 results in an underestimate of air quality or public health impacts from the Project.<sup>8</sup>

Based on the foregoing, Sierra Club's 11<sup>th</sup>-hour comments on the modeling protocol are without merit, and we believe there is no need to remodel air quality impacts for P3. Nonetheless, we understand that VCAPCD has committed to model without the ADJ\_U\* option, utilizing SJVAPCD to complete this modeling, and that the results of the remodeling will be provided in parallel with the ADJ\_U\* modeling analysis. We have no objection to this approach by the districts, and we look forward to a timely release of the PDOC.

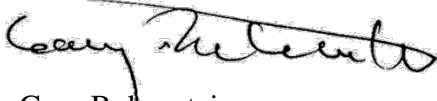
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<sup>7</sup> [www.valleyair.org/busind/pto/tox\\_resources/airqualitymonitoring.htm](http://www.valleyair.org/busind/pto/tox_resources/airqualitymonitoring.htm)

<sup>8</sup> The Sierra Club letter suggests that "Reliance on an unreliable and unapproved model variant to predict air quality impacts from the Puente Project will likely under-estimate actual emissions..." We assume this is a typographical error, because obviously the model is not being used to estimate emissions from the project.

We appreciate the VCAPCD's and SJVAPCD's work on the review of the P3. If you have any questions or require additional information to complete the VCAPCD review, please do not hesitate to contact me or George Piantka with NRG at (760) 710-2156.

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Rubenstein". The signature is fluid and cursive, with a long horizontal stroke at the top.

Gary Rubenstein  
Senior Partner

Attachment

cc: Jon Hilliard, CEC Project Manager  
Leland Villalvazo, SJVAPCD  
George Piantka, NRG

# Modeling Protocol Review For Mandalay Energy Center

The District has reviewed the modeling protocol for the Mandalay Energy Center (MEC) submitted by Sierra Research. The proposed project is located in the City of Oxnard, CA within the county of Ventura. The project consists of one simple-cycle 2,500 MMBtu/Hr natural gas fired turbine which will replace two, permitted units 1 and 2, existing 1,990 MMBtu/Hr natural gas fired boilers (215 MW ea.). Other units at the facility will remain and will not be modified by / or under this project.

The following are the District's comments to the modeling protocol submitted on December 23, 2014 and email questions.

## 1. Proposed Models (3.1):

MEC is proposing to use the following models:

1. AERMOD for conducting HRA & AAQA assessments
  - a. BPIP-Prime for estimating building downwash parameters for input to AERMOD
2. SCREEN3 for fumigation assessment
3. CTSCREEN for complex terrain.

In reviewing the proposed models, the District is concerned that a screening model is being used to replace the results from a recommended/preferred model. EPA's initial evaluation of the CTDMPLUS, the refined version of the model, indicated that AERMOD overall performed well compared to CTDMPLUS and AERMOD predicated concentration greater than CTDMPLUS in only 20% of the scenarios evaluated. Based on this information, the District is not confident that the use of the CTSCREEN model would produce results that are more accurate than those of AERMOD. Therefore, the District recommends that AERMOD be used for all modeling runs except for fumigation determinations.

## 2. Ambient Ration Method and Ozone Limiting Method (3.2):

MEC is proposing to perform a Tier 2 assessment using a NO<sub>2</sub>/NO<sub>x</sub> ratio of 75% when determining annual impact. No indication of the hourly NO<sub>2</sub>/NO<sub>x</sub> ratio to be used was provided. As reference by MEC (EPA 2014b), EPA would allow an hourly NO<sub>2</sub>/NO<sub>x</sub> ratio of 80%. Therefore, the District recommends that this ratio be used when evaluating the 1-hour NO<sub>x</sub> impacts.

For the Tier III (OLM) assessment, MEC is proposing to include existing permitted equipment (Unit 3 and the DICEs) to the modeling scenarios. Based on the project description on page 2 of the protocol, these units will not be modified as part of the project. Section 3.6.1 of the protocol indicates that the existing units will be added to the modeling concentration from the proposed unit and the background monitor concentration to determine the maximum impact from the project. Using this procedure may overestimate the NO<sub>x</sub> impact, as the monitoring site being used for this assessment would also include the impact from existing units (1, 2, 3, and the DICEs). By including Unit 3 and the DICEs as additional sources has the potential to double count the NO<sub>x</sub> emissions from these units. Therefore, the District recommends that Unit 3 and the DICEs be excluded from the Tier III assessment and the monitoring site be used to represent the NO<sub>x</sub> background concentration within the vicinity of the project when evaluating the project's impact for NSR purposes.

### 3. Health Risk Assessment Modeling (3.3)

The District recommends that the HRA section be updated to address other pathways that might be affected by the project's emissions. Such as food (home grown garden) and fish ingestion or justification that the default 15% would still provide an adequate estimate of exposure. Additional questions are addressed under the Email Questions section.

### 4. Ambient Air Quality Analyses(3.6)

The AAQA analysis proposes using EPA preferred method of model concentration vs. SIL and then modeling plus background, the District recommends reversing steps 1 and 2 (p. 10-11), see flow chart below.

#### Additional NSR Recommendations:

- Not to include existing permitted units to the background (p. 11)
- Not to include existing units in the 1-hour NO<sub>2</sub> Tier 11 analysis (p. 14)
- The 1-hour SO<sub>2</sub> analysis should follow the same basic steps as the 1-hour NO<sub>2</sub> analysis (p. 14)?

### 5. General Comments

The review of the protocol does not contain specific modeling or sources parameters. The District will make its final review once this additional information has been supplied. This is not to say that modeling cannot be conducted, but simply to point out that since no parameters have been reviewed, the District may have additional comments once the modeling inputs have been submitted.

### Email Questions

1. The met data period. We want to submit the application in February or March, 2015. We have got the corresponding met data and ambient data for this project that you prepared for the period of 2009~2013. As you said, for the current time frame of the application, it is almost impossible to prepare a quality assured 2014 data. So we propose to use the 5 year 2009~2013 met and ambient data that are already established for this modeling. We want to make sure the agencies agree on this.

**A:** You are correct 2014 data may not be available until early January 2015 and it would still need to be determined if any QA/QC was needed. This would apply to the Upper Air data as well. Even if the meteorological data was available, the monitoring data for 2014 is not required to be submitted to EPA until the end of March of 2015. Therefore, as you indicated above, the 2009 – 2013 Monitoring and Meteorological data will be used to conduct all modeling scenarios. This would be acceptable to the District.

2. The ADJ\_U\* option. The project will be a non-PSD project. We want to use the met data with the ADJ\_U\* option that you prepared, coupled with AERMOD Beta option in the modeling. We want to make sure the agencies agree on this as well.

**A:** Since the proposed project is being considered a Non-PSD project, the ADJ\_U\* option would be acceptable.

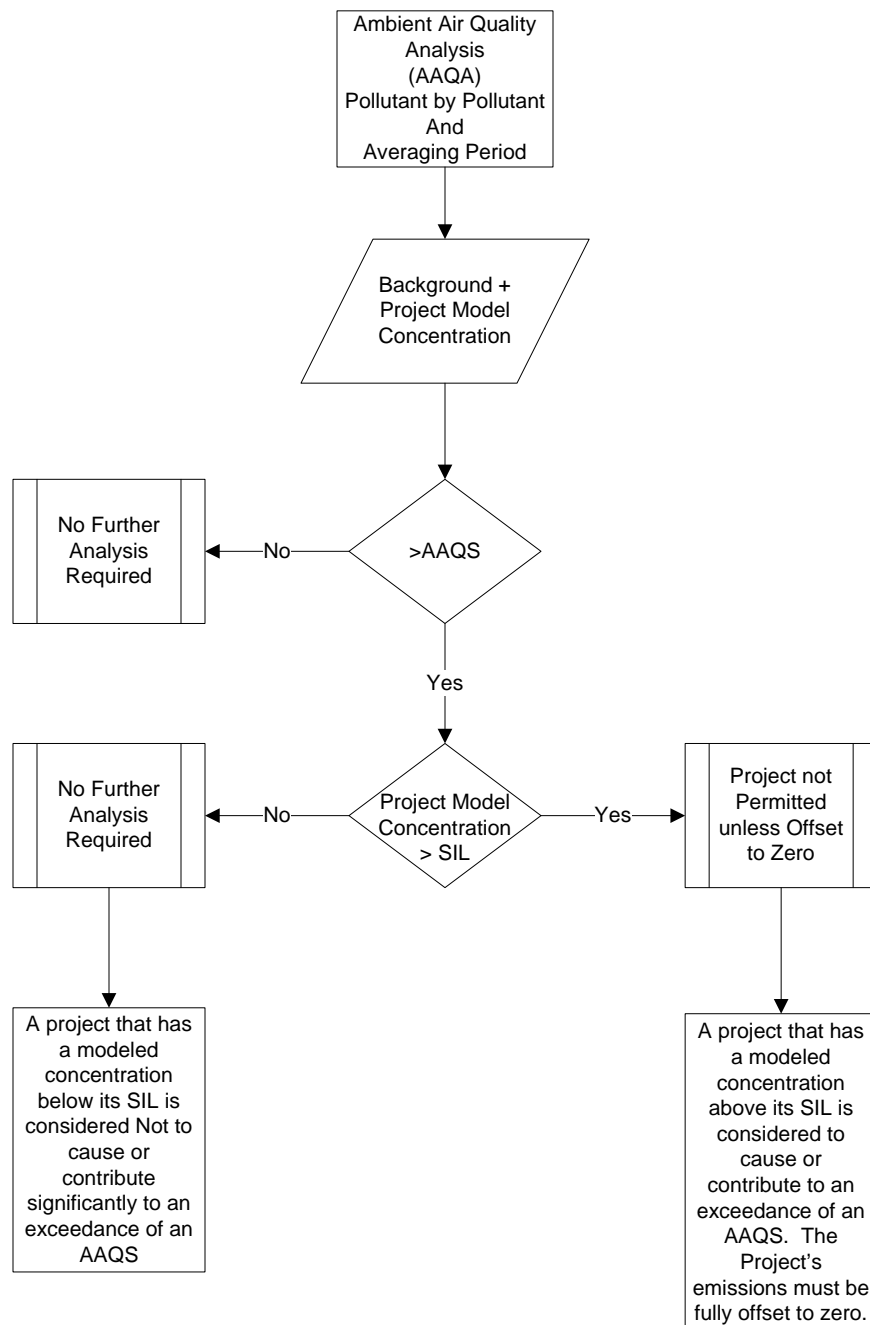
3. NO<sub>2</sub> modeling. As you suggested, we will do the 1 hour NO<sub>2</sub> modeling in two approaches, if necessary:
  - a. The Monthly Hour-Of-day approach: using 5 year average (2009~2013) month hour of day ozone and 3 year average (2011~2013) month hour of day NO<sub>2</sub> data, both from the nearby El Rio-Rio Mesa School #2 ambient monitor, as the back ground data. If that fails, we will proceed to approach b.

b. The Paired sum approach: use concurrent 5 year (2009~2013) ozone and NO2 data from “El Rio-Rio Mesa School #2” site.

**A:** Based on guidance from EPA, the NO2 modeling approach discussed and described above would be acceptable.

4. Health risk analysis: we will use the most current HARP in the health risk analysis during our application time frame. We want the approval from the agencies as well.

**A:** The District recommends using the current version of the HARP program when performing the modeling runs. If during the District’s review the new version of the HARP program is approved, the District will update the result as needed.



**AAQA Process**