

## DOCKETED

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## CALIFORNIA ENERGY COMMISSION

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July 16, 2014

George Piantka  
NRG Energy, Inc.  
181 7 Aston Avenue, Suite 104  
Carlsbad, CA 92008

Dear Mr. Piantka:

**CARLSBAD ENERGY CENTER PROJECT AMENDMENT (07-AFC-6C) DATA REQUESTS, Set 1 (#1-30)**

The California Energy Commission staff has reviewed the Petition to Amend the Carlsbad Energy Center Project, and requires additional information to supplement the environmental analysis pursuant to Title 20, California Code of Regulations, section 1769(a)(1)(E). The California Energy Commission staff seeks the information specified in the enclosed Data Requests. The information requested is necessary to: 1) more fully understand the project; 2) assess whether the facility will be constructed and operated in compliance with applicable regulations; 3) assess whether the project will result in significant environmental impacts; 4) assess whether the facilities will be constructed and operated in a safe, efficient, and reliable manner; and 5) assess potential mitigation measures.

This set of Data Requests (#1-30) is being made in the areas of: Air Quality (#1-19), Traffic and Transportation (#20), and Transmission System Engineering (#21-30). Staff requests that written responses to the enclosed Data Requests be provided on or before August 15, 2014. Staff encourages the Applicant to submit responses sooner, if possible, in order to facilitate the schedule.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, please send a written notice to both Commissioner Karen Douglas, Presiding Committee Member for the Carlsbad Energy Center Project Amendment, and me, within 20 days of receipt of this letter. The notification should contain the reasons for not providing the information, the need for additional time, and the grounds for any objections. If you have any questions, please call me at (916) 654-4894, or E-mail me at [mike.monasmith@energy.ca.gov](mailto:mike.monasmith@energy.ca.gov).

Sincerely,

Mike Monasmith  
Senior Project Manager

Enclosure:  
Data Requests

**Technical Area: Air Quality**

**Author:** William Walters

**BACKGROUND: EPS DEMOLITION EMISSIONS ASSUMPTIONS**

The May 2, 2014 Petition to Amend (PTA) request includes a request that the Encina Power Station (EPS) demolition be included within the Amended CECP license. However, the amendment request provides limited information regarding the proposed demolition methods, particularly those proposed to remove the 400-ft exhaust stack and the 12-story power plant building. Staff requires the following data requests to be answered to fully understand and evaluate the air quality impacts of the proposed EPS demolition.

**DATA REQUESTS**

1. Please describe or show graphically the periods/activities of assumed overlap for the seven demolition stages/segmented tasks outlined in PTA, Section 2.2, and identify the corresponding matching months in the CalEEMod modeling input/output files.
2. Please clearly identify in which demolition stage the stack demolition will occur.
3. Please describe in detail the primary demolition method(s) for the 400-ft exhaust stack (i.e. felling, implosion, crane-mounted impact hammer, crane-mounted platform for workers to use hand held impact hammers, some combination of these methods, or other methods).
4. Please describe in detail the primary demolition method(s) for the power plant building (i.e. implosion, crane mounted impact hammer, wrecking ball, workers using hand held impact hammers, some combination of these methods, or other methods).
5. Please provide copies of any separate emissions calculations, beyond the provided CalEEMod files, that correspond with the EPS demolition emissions estimate summarized in Appendix 5.1F.
6. Please provide a discussion of the assumptions used to calculate the EPS demolition air quality emissions summarized in Appendix 5.1F, and embedded in the CalEEMod program files used to calculate the air quality emissions. This should include at a minimum:
  - a. The off-road equipment assumptions, including the rationale for the number, type and size of the equipment selected (including whether CalEEMod default values were used), and the engine tier selected as a mitigation assumption.
  - b. The other mitigation measure assumptions used in the program and their assumed control efficiencies.
  - c. The basis for the vehicle trip distances used in the model for trip types not covered in the data request below.
  - d. The assumptions used for unpaved road dust emissions calculations.

- e. The assumptions used to calculate the fugitive dust emissions from the stack and power plant building demolition work.
  - f. For the other fugitive dust emission sources, please identify the types of emissions sources included within the CalEEMod program and the basis for the emissions mitigation control efficiencies assumed.
7. To confirm the heavy haul truck trip numbers and mileage estimate assumptions used in the emissions calculations, please provide the following:
- a. The total volume and weight of concrete/steel/other wastes generated from the demolition of the stack.
  - b. The total volume and weight of concrete/steel/other wastes generated from the demolition of the power plant building.
  - c. The types and quantities of stack/power plant building/other demolition wastes that would be recycled (tons) onsite.
  - d. The types and quantities of stack/power plant building/other building/structure demolition wastes that would be recycled offsite, the amount shipped per load (tons/truckload), and the location where the recycled materials would be shipped (distance from site by type of material).
  - e. The assumed quantity of the contaminated and uncontaminated soil wastes (tons), the amount shipped offsite (total tons), the amount shipped per load (tons/load), and the location where the soil wastes would be shipped (distance from site by type).
  - f. The total amount of clean fill or other imported materials (such as aggregate, concrete or other material) that would be required to complete the EPS demolition.

#### **BACKGROUND: CONSTRUCTION EMISSIONS ASSUMPTIONS**

The May 2, 2014 Petition to Amend (PTA) request (TN 202287) does not provide clear information regarding the overlap for the construction of this project with the overlap for the Tank Demolition as proposed in another recent PTA request (TN 202267). Staff requires additional information to understand what is included in the emissions estimates of each of these amendment requests. Additionally, staff has a few questions about assumptions used in the CalEEMod emissions estimate performed for the Simple Cycle Amendment request and the emissions results shown in Appendix 5.1F.

#### **DATA REQUESTS**

8. The fugitive dust particulate emissions estimate appears very low for a construction project. Please identify the following:
- a. Describe the site grading work that is done as part of the tank demolition work versus the site grading work that is done during the project construction as defined in this amendment request.

- b. Please describe the site access route and whether it is all paved or if a portion of the route, including on-road vehicle movement within the bermed area, is unpaved and describe how the emission for the paved and unpaved road transportation were estimated through the input assumptions used in the CalEEMod model.
  - c. The reference sources for the silt content assumption used for unpaved road dust emissions calculations and the silt loading assumption for paved road dust calculations.
  - d. The basis for the control assumption used for unpaved road dust emissions mitigation.
  - e. For other fugitive dust emission sources, please identify the types of emissions sources included within the CalEEMod program and the basis for the emissions mitigation control efficiencies assumed.
9. Please provide a discussion of the exhaust emission source assumptions used to calculate the air quality emissions summarized in Appendix 5.1F and embedded in the CalEEMod program files used to calculate the air quality emissions. This should include at a minimum:
- a. The off-road equipment assumptions, including the rationale for the number, type and size of the equipment selected, and the engine tier selected as a mitigation assumption.
  - b. For on-road vehicle assumptions, the mitigation assumptions used in the program and the basis for the trip distances used in the model.
10. Table 5.1F-4 on page 5.1F-5 in Appendix 5.1 provides erroneous daily emissions totals. The modeling files appear to use the correct daily values. Please provide a correction to table to confirm the proper daily emissions values.

#### **BACKGROUND: OPERATION EMISSIONS ASSUMPTIONS**

Essentially all of the major equipment items related to the CECP, including the gas turbine functional type, are changed in the PTA request. Staff requires the following data requests to be answered to fully understand and evaluate the operation air quality emissions estimate for the revised CECP project.

#### **DATA REQUESTS**

11. Please describe why the emissions calculations for the new natural gas compressor use Table 2-4 from the cited 1995 USEPA reference, which doesn't have a specific component category for compressor seals, rather than Tables 2-1 or 2-2 that do have specific emissions factors for compressor seals. Please also note any specific design or maintenance assumptions that would reduce the emissions from the piping components associated with the compressor.
12. Staff has compared the hourly emissions estimates for the LMS100 gas turbines, by operating mode, that are provided in the amendment request with the estimate that was prepared and approved for the Pio Pico project (11-AFC-1). There are a few differences, most minor, between these estimates. We have the following

questions, in addition to those posed by the San Diego Air Pollution Control District, regarding these differences:

- a. The hourly normal operating emissions for all pollutants, other than particulate emissions, are roughly just under ten percent higher than those proposed for the Pio Pico project even though the Best Available Control Technology (BACT) concentration limits and fuel sulfur assumptions are the same as those used for Pio Pico. Is this difference due to the difference in heat input assumed, which is essentially the same amount higher than assumed for Pio Pico, and why would what look to be essentially identical LMS100PA gas turbines have 100 percent load heat input rates that are so different?
- b. In regards to the question above, is the increase in heat input and gross generator output meant to compensate for the reductions in efficiency due to the use of a fin-fan air cooler as the primary heat rejection unit rather than a cooling tower as proposed for Pio Pico?
- c. While the amount of heat input is higher in comparison to Pio Pico the amount of water assumed to be used for NOx control is notably lower than that assumed for Pio Pico with the same assumed pre-selective catalytic reduction control concentration. Can you please identify why less water is needed for NOx control, such as whether this is due to recent improvements in the gas turbine burner design?
- d. Please confirm that this amendment proposes use of the latest LMS100 gas turbine model and confirm that you do not intend on revising the LMS100 gas turbine model or specifications prior to completing the amendment review process.

#### **BACKGROUND: AIR DISPERSION MODELING BASE HEIGHT ASSUMPTIONS**

Staff has questions regarding the base height used for construction emissions modeling and the change in base height used for the operations emissions modeling. The base height for the on-site construction emission sources was assumed to be between approximately 14.6 and 15.6 meters, depending on the source location. This is well above the base height of where most of the construction would occur within the existing tank area. In addition to this, a release height of 6 meters has been assumed for the modeled emissions sources, which staff agrees is reasonable for the off-road equipment that have thermally buoyant plumes, but not for the fugitive dust emission sources. The base height during operations has been raised by approximately 4.5 feet in for the amended project (10.52 meters versus 9.144) without providing rationale for this change. Staff needs additional information from the applicant to confirm the assumptions used in the construction and operation modeling analyses.

#### **DATA REQUESTS**

13. Please explain the basis for the construction emission source base height assumptions and provide rationale why, considering the elevated source release

height, the base height should not be reduced to the same base height used for the operation emission sources.

14. Please provide compelling rationale for why the 6-meter release height, in addition to the elevated base height, for the non-thermally buoyant construction fugitive dust emissions sources, is a valid assumption.
15. Please indicate why all fugitive dust emissions were modeled with a 6-meter release height even though the applicant's modeling protocol notes that the wind erosion dust emissions would be modeled with a release height of 0.5 meters.
16. Please describe if the increase in the assumed base height for the operation emission sources would be completed by using the internal tank berm materials, imported fill, or a combination of the two, and describe how the work necessary to create this increase in base height was included in the construction emissions estimate (equipment use, truck trips, fugitive dust emissions).

#### **BACKGROUND: CONDITIONS OF CERTIFICATION**

Section 5.1.8 of the PTA request notes that the District's new Determination of Compliance (DOC) is needed to determine appropriate changes to the air quality conditions of certification. Staff agrees this is true for the District's DOC conditions, but there are also ten staff conditions of certification that do not require the new DOC for review, some of which clearly require editing. Other sections in the Amendment Request provide applicant-proposed edits to staff conditions of certification, and staff would like the applicant to provide their requested edits, including deletions or additions, to the staff air quality Conditions of Certification.

#### **DATA REQUEST**

17. Please provide proposed redline and strikeout edits to staff Conditions of Certification AQ-SC1 through AQ-SC10.

#### **BACKGROUND: GREENHOUSE GAS EMISSIONS ESTIMATE ASSUMPTIONS**

Staff has questions about the existing project and amended project GHG emissions comparison provided in the PTA request (Table 5.1-40). We need additional information to compare the GHG emissions efficiency.

#### **DATA REQUEST**

18. Please provide an estimate of the amount of net electricity generation in megawatt-hours or gigawatt-hours (MWh or GWh) that corresponds with the GHG emissions values presented in Table 5.1-40, including the assumptions and calculation used to determine each of those electricity generation totals.

#### **BACKGROUND: PROJECT AIR QUALITY/GHG RELATED CORRESPONDENCE**

Staff is aware that there may be a considerable amount of correspondence, including large data submittals, between the applicant and the San Diego Air Pollution Control District (District) to support the District's air quality permit application review. Also, there is the potential for project-related correspondence with state or federal air quality agencies. Staff needs to stay informed about this correspondence in order to make sure our review is consistent with the review of the District and to understand, in a timely manner, any issues that arise from this correspondence.

#### **DATA REQUEST**

19. Please provide (Docket) copies of all project-related correspondence with all local, State and federal air quality agencies within 5 days of receipt or submittal.



**Technical Area: Traffic and Transportation**  
**Author: William Walters**

**BACKGROUND: THERMAL PLUME DATA**

The PTA request would change the turbine type and the air-cooled heat rejection unit number and sizes. While these changes clearly do not create a potential for visible water vapor plume impacts, staff does require additional information for the fin-fan coolers to assess the amended project's potential for thermal plume impacts.

**DATA REQUEST**

20. Please identify the following parameters for a single fin-fan cooler:

- a. Heat rejection (MW/hr)
- b. Air flow (kg/hr)
- c. Temperature increase (°C)
- d. Surface area of the exhaust (m<sup>2</sup>)
- e. Average exhaust velocity (m/sec)

**Technical Area: Transmission System Engineering**  
**Authors: Ajoy Guha, P. E. and Mark Hesters**

**Introduction**

Staff has reviewed the Carlsbad Energy Center LLC's May 2, 2014 "Petition to amend (PTA) the License for the Carlsbad Energy Center Project (CECP)", but has not found a complete description of the transmission interconnection facilities for all six simple-cycle combustion turbine generating (CTG) units with a total 632 MW nominal output. Staff needs a complete description of the proposed transmission interconnection facilities, including the project switchyards, the generation tie lines, and the interconnections to the existing transmission grid. These are the facilities that fall under the licensing authority of the California Energy Commission and complete descriptions are required in order to analyze the modified CECP's continuing compliance with applicable laws, ordinances, regulations and standards (LORS).

Staff has also reviewed the California ISO's "Interconnection Reassessment Study Report" dated October 22, 2013, along with Individual Reports for the proposed CECP combined cycle units (Queue project nos. Q137 and Q189). This study analyzed the original project, a total of 520 MW split between two combined cycles (260 MW each). However, the current PTA is for six CTG units totaling 632 MW. In order to analyze the project's compliance with LORS, and to assess the potential impacts of the transmission system, staff needs an interconnection study consistent with the proposed project amendment.

**BACKGROUND: ONE-LINE DIAGRAMS**

The Petition to Amend (PTA) does not include complete electrical one-line diagrams of the four 230/13.8kV and two 138/13,8 kV CECP switchyards, the Encina "Cannon" 230 kV Substation (pre and post-project) , the SDG&E Encina 138 kV and 230 kV switchyards, and details of 230 kV and 138 kV generation tie lines (PTA, sections 3.1 and 3.2, pages 3-1 to 3-4).

**DATA REQUESTS**

21. Provide a complete electrical one-line diagram (or resubmit Figure 2.1-2 with size/ratings of the applicable equipment and/or missing elements) of the four proposed CECP 230 /13.8 kV switchyards, one for each of the proposed CTG Units 6, 7, 8 and 9, and also for the two proposed 138/13.8 kV switchyards for CTG Units 10 & 11. The diagrams should show all equipment for the interconnection facilities within the switchyards including sizes and/or ratings as follows:
  - a. Generator ratings in MVA, Voltage and maximum MW output capability with power factor;
  - b. Any bus duct connectors, overhead conductors or cables between the generator units and the 13.8/15 kV switchgear buses, breakers and disconnect switches on the low side of each generator step-up transformer (GSU);

- c. The GSU transformer with ratings and percentage impedance of the GSU transformers based on the base MVA ratings;
  - d. Any short overhead conductors/cables from the high side of the GSU transformer to the respective switchyard 230 kV/138 kV buses
  - e. Configuration of the 230 kV and 138 kV switchyards, including breakers, disconnect switches and proposed generator (gen) tie line outlets.
22. Provide a clear leveled physical layout drawing of the CECP 230/13.8 kV and 138/13.8 kV switchyards showing all major equipment (generators, buses, transformers, breakers, buses and disconnect switches etc.) and transmission line outlet(s).

### **BACKGROUND: GENERATOR TIE LINE**

The submitted generator (gen) tie line routes description and diagrams in the PTA are incomplete and are not distinct (PTA, Figures 2.0-1 and 2.2 -2).

### **DATA REQUEST**

23. Please provide a discussion and drawing of the physical layout showing distinctly (in a larger scale) the preferred route(s) (along any road, land, transmission line or power station) of the following overhead and underground gen tie lines including their right of way (ROW) width(s) between the proposed Amended CECP 138/230 kV switchyards and SDG&E 138/230 kV Encina Power Station (EPS) switchyards. Describe whether the ROW would be through private and/or public lands (including land west of the railroad tracks following demolition activities sought by the Petitioner in the PTA).
- i. The two, 200 foot-long 138 kV overhead gen tie lines between the proposed CECP 138 kV switchyards for CTG Units 10 & 11 and the existing SDG&E EPS 138 kV switchyard.
  - ii. The 4,000 foot-long 230 kV gen tie line between the proposed 230 kV switchyards for CTG Units 6, 7, 8 & 9 and a dead-end pole near the northeast corner of the existing EPS 138 kV switchyard, to where the transmission line transitions into an underground (UG) line to maintain electrical clearance.
  - iii. The proposed 230 kV UG cable line between the above dead-end overhead pole and the existing EPS 230 kV switchyard.

### **BACKGROUND: TRANSMISSION POLES**

The submitted pole design diagrams are incomplete (PTA section 3.2.3 and 3.2.4, pages 3-3 and 3-4). Depictions of the poles (that could help identify their characteristics and type) also vary in the **Visual Resources** section, most notably Figures 5.13-2A and Figures 5.13-2B and C.

## **DATA REQUESTS**

24. Resubmit 138 kV single line dead-end pole diagram (Figure 3.1-5) and 230/138 kV double-circuit tangent and dead-end pole diagrams (Figures 3.1-6 & 3.1-7) design diagrams stating type of the pole(s) (steel or wood or any other), length of the insulators, and size & type of overhead conductors. Please show the height of the poles below and above the ground level, conductor-position measurements for the 230 kV and/or 138 kV side of the pole, and between conductors of both sides. Also show and describe any ground conductors, including their size, and provide the ground clearance distance from the lowest conductor on the pole.
25. Submit a 138 kV single line tangent pole design diagram stating type of the pole and showing configuration of the insulators and conductors with their respective position measurements on the pole, including ground clearance from the lowest conductor point, height of the pole above and below ground level, and the ground conductors, if any, with size and type description.
26. Provide the length, type, size, and ampere-rating of the proposed single-core UG 230 kV cable line. Submit a design drawing diagram of the proposed UG 230 kV single-core cable line termination on the 230 kV overhead dead-end pole structure showing position of the rising cable line on the pole, distances between cable terminating insulators and jumper cables to the overhead line. Also describe with a diagram how the cable line would be terminated at the SDG&E 230 kV switchyard.
27. For the 230 kV UG single-core cable line, submit a drawing for typical Duck Bank type construction embedded in concrete showing its width and height, and four PVC cable conduits with sizes suitable for drawing the selected three single-core UG cable lines with a spare one and an additional smaller conduit grounding and communication cables. Provide the vertical and horizontal distances between the conduits and the ground surface including depth and type of backfill.

## **BACKGROUND: ELECTRICAL ONE-LINE DIAGRAMS**

The PTA does not include pre and post-project electrical one-line diagrams and physical layout drawings of the SDG&E EPS 230 kV and 138 kV switchyards (PTA, sections 3.2.3 and 3.2.4).

## **DATA REQUESTS**

28. Submit pre and post-project electrical one-line diagrams of the existing SDG&E EPS 138 kV and 230 kV switchyards showing configuration of switchyard buses and switching bays (with SB nos.) with breakers and associated disconnect switches with their respective sizes and/or ratings in amperes along with all transmission outlets showing the modifications in the switchyard for interconnection of the overhead 138 kV and the UG 230 kV gen tie lines. In addition, provide post-project electrical one-line diagrams of the SDG&E 138 kV and 230 kV switchyards after the decommissioning of the Encina Power Station

(EPS), and disconnection of the existing EPS Units as scheduled in 2017. Fully describe and detail any and all measures proposed to insure transmission infrastructure integrity and the during the EPS demolition activities sought by the in the PTA. Moreover, describe any and all transmission measures and details planned for the seamless and timely transition from EPS Unit electrical generation to that of the Amended CECP.

29. Provide pre and post-project physical layout drawings of the SDG&E EPS 230 kV and 138 kV switchyards, with all transmission outlets.

### **BACKGROUND: INTERCONNECTION REASSESSMENT STUDY**

Since the October 22, 2013, California ISO "Interconnection Reassessment Study Report" with Individual Project Reports are not consistent with the May 2, 2014 CECP Petition to Amend (PTA), the Petitioner needs to submit a current Interconnection Reassessment Study Report by the California ISO for the proposed CECP 632 MW project (PTA, sections 3.2.5).

### **DATA REQUEST**

30. Submit a current Interconnection Reassessment Study Report along with the Individual Reports performed by the California ISO, in accordance with the May 2, 2014 "Petition to Amend" the Carlsbad Energy Center Project (CECP), given proposed modifications to the 540 MW Licensed CECP would result in a 632 MW Amended CECP.