DOCKETED

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Dr. Tao Jiang
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

    Subject: Pio Pico Energy Center Response to Data Request

Dear Dr. Jiang:

On July 31, 2015, a petition to amend the Commission Decision for Pio Pico Energy Center (PPEC) was filed. In an October 8, 2015 email, you requested additional information in order to complete your evaluation of the petition. Sierra Research offers the following responses on behalf of the applicant.

DATA REQUESTS

1. *What is the basis for concluding that the tank dimension changes would not affect the stack plume?*

Response: Building downwash is the effect that buildings have on the wind flowing over or around them. Plumes carried by the wind can be directed downward, resulting in higher impacts than would occur without the building.

The building's size and shape determines the area where downwash is a consideration. In AERMOD, this area is the "GEP 5L area of influence." The effect of building downwash on plume dispersion is included in the modeling analysis when the stack is within the area of influence; it is ignored when the stack is outside the area of influence.

AERMOD uses the Building Profile Input Program (BPIP) to determine whether or not a stack is being subjected to wake effects from a structure or structures. When a stack is outside the area of influence of a building, wake effects from that building are not included in the modeling.

Figure 1 shows the areas of influence of the waste water tank and the clarifiers in relation to the nearest stacks. The turbine stacks are well outside the areas of influence of the structures. As a result, AERMOD ignores wake effects from these structures on dispersion from the turbine stacks. Because these structures are ignored when modeling impacts from the turbine stacks, changes in the dimensions of these structures will not affect the turbine modeling results.

Figure 1. GEP 5L Area of Influence from Clarifiers and Water Tanks
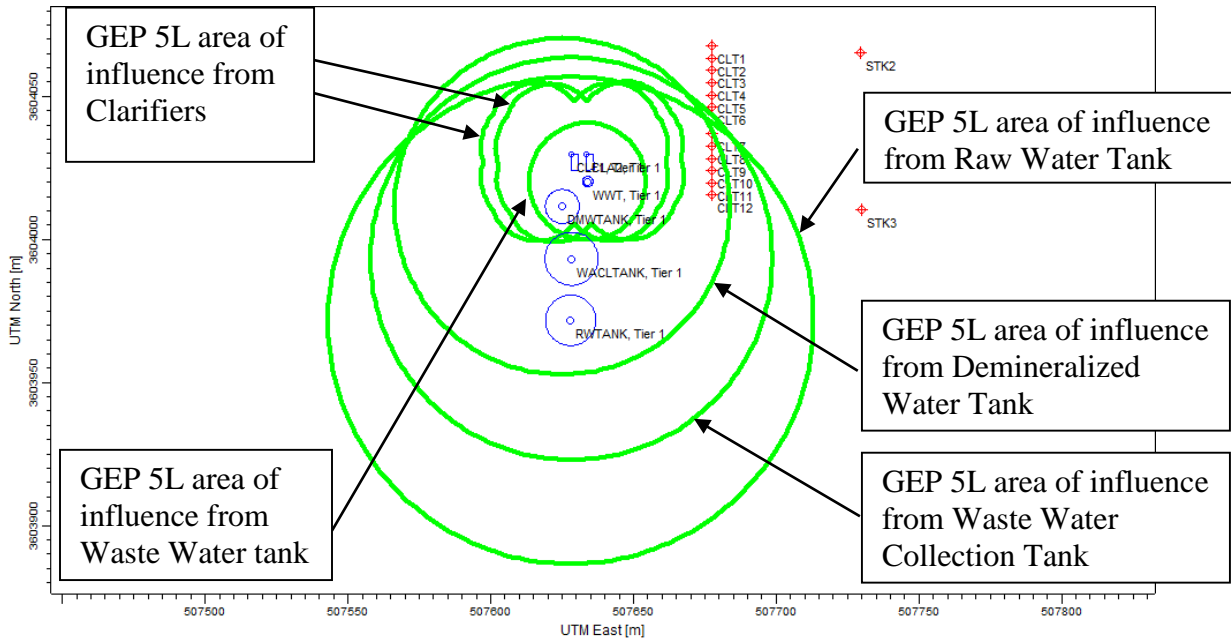
2. *Provide documentation that the turbine stack plumes would be unaffected by the new structure(s), or please redo the plume velocity analysis including the stacks (and any updated data/structures from the table below).*

Response: Please see response to Data Request 1.

BACKGROUND

Building dimension parameters in the modeling file do not match those in PTA, as shown in the table below.

Structure	Modeling File	PTA
1. Wastewater Treatment Building	161'x79'x25' high	165' x 80' x 23' high
2. Final Wastewater Storage Tank (FWST)	Not included	12' diameter x 35.5' high
3. Demineralized Water Tank	34' diameter 39' high	Not included
4. Clarifiers	Not included	18' length x 9' width x 25' high

DATA REQUESTS

3. *Why were structures #2 and #4 excluded from the modeling analysis and why was structure #3 excluded from the petition to amend (PTA)?*

Structures #2 and #4 were excluded from the water tank PTA modeling analysis because they were not included in the original modeling analysis. They were excluded from the original modeling analysis because they are too far away from the cooling system to be included in the modeling. Current guidance is to exclude structures that are more than 5L distant from the stack, where L is the lesser of the structure height and projected width.[1] For the FWST, the 5L distance is 60 feet; for the clarifiers, the 5L distance is 101 feet. The distance from the nearest element of the cooling system to either structure is greater than the 5L distance, and the structures can therefore be disregarded for modeling purposes. See Figure 1.

Structure 3 was not discussed in the PTA because the tank working capacity is not being changed from what was licensed. Because the tank height and diameter will be slightly different (even though the tank working capacity is unchanged), we modeled the new dimensions for the air modeling analysis. The correct dimensions for the demineralized water tank, as shown in the modeling files, are a 39 foot diameter and a 34 foot height.

4. *Why are the dimensions inconsistent and which dimensions are correct?*

Only the dimensions of the wastewater treatment building are inconsistent between the modeling file and the PTA. The dimensions in the PTA are correct for that structure.

The proposed changes to the wastewater building dimensions were not modeled because the modeling focused on those changes that might increase impacts. Because the proposed Wastewater Treatment Building is shorter than previously modeled, the new dimensions will decrease, rather than increase, project impacts. The dimensions used for the modeling are the same as those used in the original permit application and the heat input PTA.

5. *Please redo the analysis using all structures and proper dimensions or explain why the modeling done to date is sufficient to describe the effect of the changes in water structures.*

The height of the Wastewater Treatment Building used in the modeling is greater than the value in the PTA. The downwash impact from the taller building that was modeled is greater than would be expected if the shorter height were used. The modeling is therefore conservative with respect to this building, and further modeling is not required.

As discussed in the response to Data Request 3, the FWST and the clarifiers are too far away from the cooling system to be included in the modeling.

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[1] The projected width of a structure varies with the wind direction. For the purposes of deciding which structures may be excluded from the modeling, the most conservatively projected width is used: projected width = $[(\text{length})^2 + (\text{width})^2]^{0.5}$.

For these reasons, the modeling analysis submitted with the PTA is sufficient to describe the effect of the changes in water structures.

Please do not hesitate to contact me if you have any other questions.

Sincerely,

Steve Hill

cc: Pio Pico Energy Center, LLC
        Dale Rundquist