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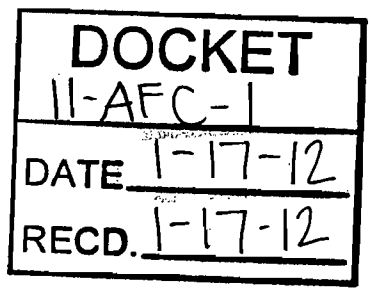
January 17, 2012

VIA EMAIL



Mr. Eric Solorio, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Pio Pico Energy Center Project (11-AFC-01)
Additional Information Submitted to USEPA

Dear Mr. Solorio:

On behalf of Pio Pico Energy Center, LLC, please find enclosed herein additional information submitted to U.S. EPA Region 9 related to the Prevention of Significant Deterioration application for the Pio Pico Energy Center Project. The enclosed information was submitted to U.S. EPA on January 5, 2012 by Applicant's consultant, Sierra Research.

Respectfully submitted,

Melissa A. Foster

MAF:jmw
Enclosure
cc: See Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *PIO PICO ENERGY CENTER, LLC*

Docket No. 11-AFC-1
PROOF OF SERVICE
(Revised 12/16/11)

Pio Pico Energy Center, LLC
Letter to Eric Solorio dated January 17, 2012 re Additional Information Submitted by Applicant to USEPA

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DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on January 17, 2012, I deposited copies of the aforementioned document and, if applicable, a disc containing the aforementioned document in the United States mail at 500 Capitol Mall, Suite 1600, Sacramento, California 95814, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

AND/OR

Transmission via electronic mail, personal delivery and first class U.S. mail were consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Judith M. Warmuth

January 5, 2012

sierra research

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Sacramento, CA 95811
Tel: (916) 444-6666
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Mr. Gerardo Rios
Chief, Permits Office
U.S. EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Pio Pico Energy Center PSD Permit Application
Modeling Questions

Dear Mr. Rios:

As requested by EPA in the December 9, 2011 meeting between representatives of EPA and Pio Pico Energy Center, LLC (Applicant), we are herein submitting additional information on behalf of Applicant. Specifically, EPA requested additional analysis and information to support the modeling performed for the Pio Pico PSD Permit Application.

It should be noted that Applicant submitted the proposed modeling protocol for the Pio Pico Energy Center (Project) to EPA on December 1, 2010, with a request for review and comment, consistent with EPA's policy encouraging early consultation on modeling issues.[1] EPA did not respond to Applicant's request. In the absence of any questions or concern expressed by EPA regarding the protocol, the Applicant proceeded with modeling and analysis consistent with the protocol, and has expended considerable time and effort in reliance on EPA's tacit approval.

Data Substitution

Comment: *Provide tables showing the measured data (prior to data substitution).*

Response: The requested information has been prepared by the San Diego Air Pollution Control District (District), and is included on the enclosed disk.

Meteorological Data

Comment: *Justify the use of Otay Mesa meteorological data to characterize conditions in the project area.*

[1] Appendix W, Section 10.2.1: "[e]very effort should be made by the Regional Office to meet with all parties involved in a SIP revision or a PSD permit application prior to the start of any work on such a project. During this meeting, a protocol should be established between the preparing and reviewing parties to define the procedures to be followed, the data to be collected, the model to be used, and the analysis of the source and concentration data."

Response: The following discussion is based on criteria described in Section 3.1 (Representativeness) in EPA's Meteorological Monitoring Guidance for Regulatory Modeling Applications (February 2000).

The guidance states that "Representativeness has been defined as 'the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application.'" The guidance indicates that "a quantitative method does not exist for determining representativeness absolutely." There are no generally accepted analytical or statistical techniques to determine representativeness of meteorological data or monitoring sites.

In general, for use in air quality modeling applications, meteorological data should be representative of conditions affecting the transport and dispersion of pollutants in the "area of interest" as determined by the locations of the sources and receptors being modeled. For this project, the "area of interest" includes the project site and the significant impact area (the area where screening modeling predicts project impact of any pollutant above Significant Impact Levels).

In steady-state modeling applications, one typically focuses on the meteorological conditions at the release height of the source or sources, or the plume height in the case of buoyant sources. Representativeness for steady-state modeling applications must necessarily be assessed in concert with the steady-state assumption that meteorological conditions are constant within the space-time domain of the application; as typically applied, measurements for a single location, somewhere near the source, are assumed to apply, without change, at all points in the modeling domain.

As can be seen in Figure 1, the Project site, the Otay Mesa monitoring site, and Brown Airfield, from whose meteorological monitoring station the few substituted meteorological data were obtained, are all situated on the same flat mesa within three miles of each other. The Otay Mesa monitoring site is less than two miles from the project site. Air flow over all three locations is sufficiently identical to consider meteorological data monitored at the International Border Crossing to represent the meteorological conditions at the project site (see wind roses for Otay Mesa and Brown Airfield monitoring data in Figures 2 and 3, respectively). Wind speeds at the Otay Mesa monitoring site are somewhat slower than those at Brown Airfield, leading to more conservative air quality concentrations computed by AERMOD from Project emissions.

Consistency would call for site selection criteria consistent with the steady-state assumption; i.e., to the extent possible, sites should perhaps be selected such that factors that cause spatial variations in meteorological conditions are invariant over the spatial domain of the application, whatever that might be. Such factors would include surface characteristics such as ground cover, surface roughness, the presence or absence of water bodies, etc. Similarly, the representativeness of existing third-party databases should be judged, in part, by comparing the surface characteristics in the vicinity of the meteorological monitoring site with the surface characteristics that generally describe the analysis domain.

Figure 1
PPEC Project Site and Vicinity

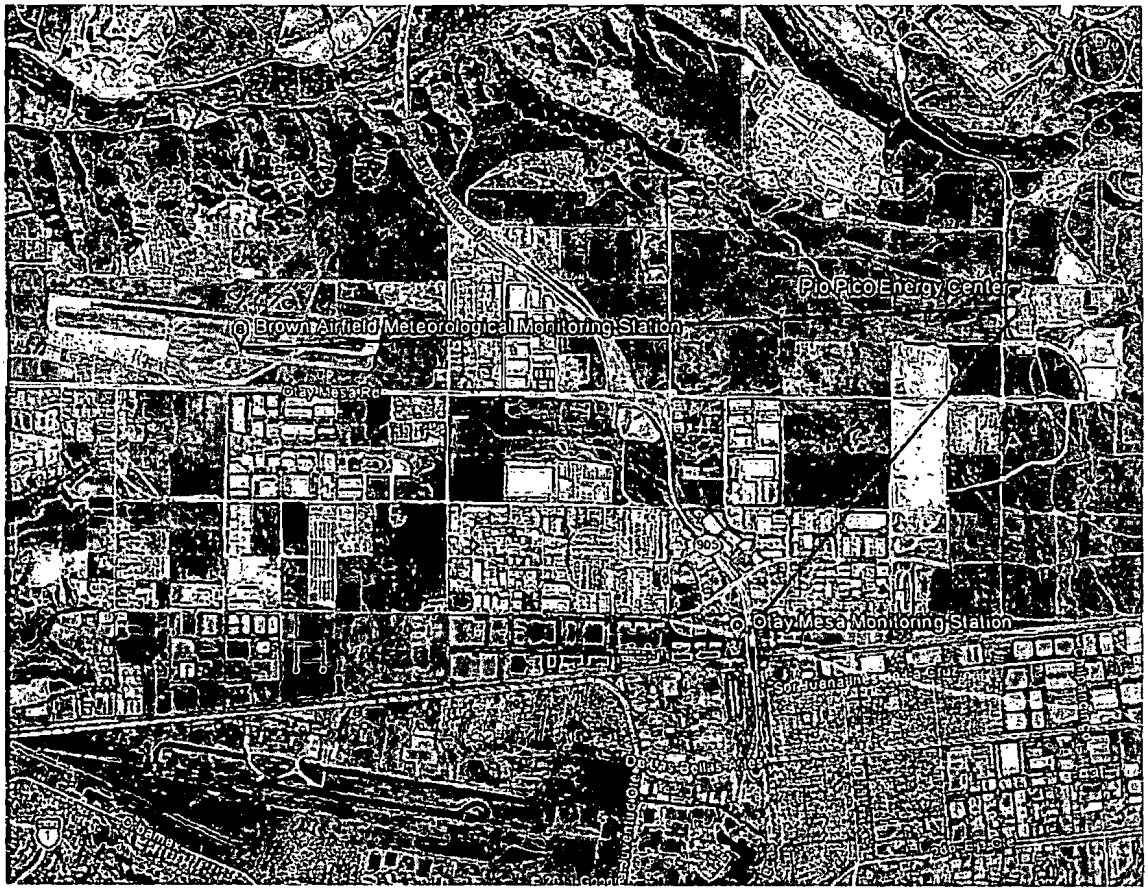


Figure 2
Wind Rose, Otay Mesa International Border Crossing Meteorological Monitoring Station, 2006-2008

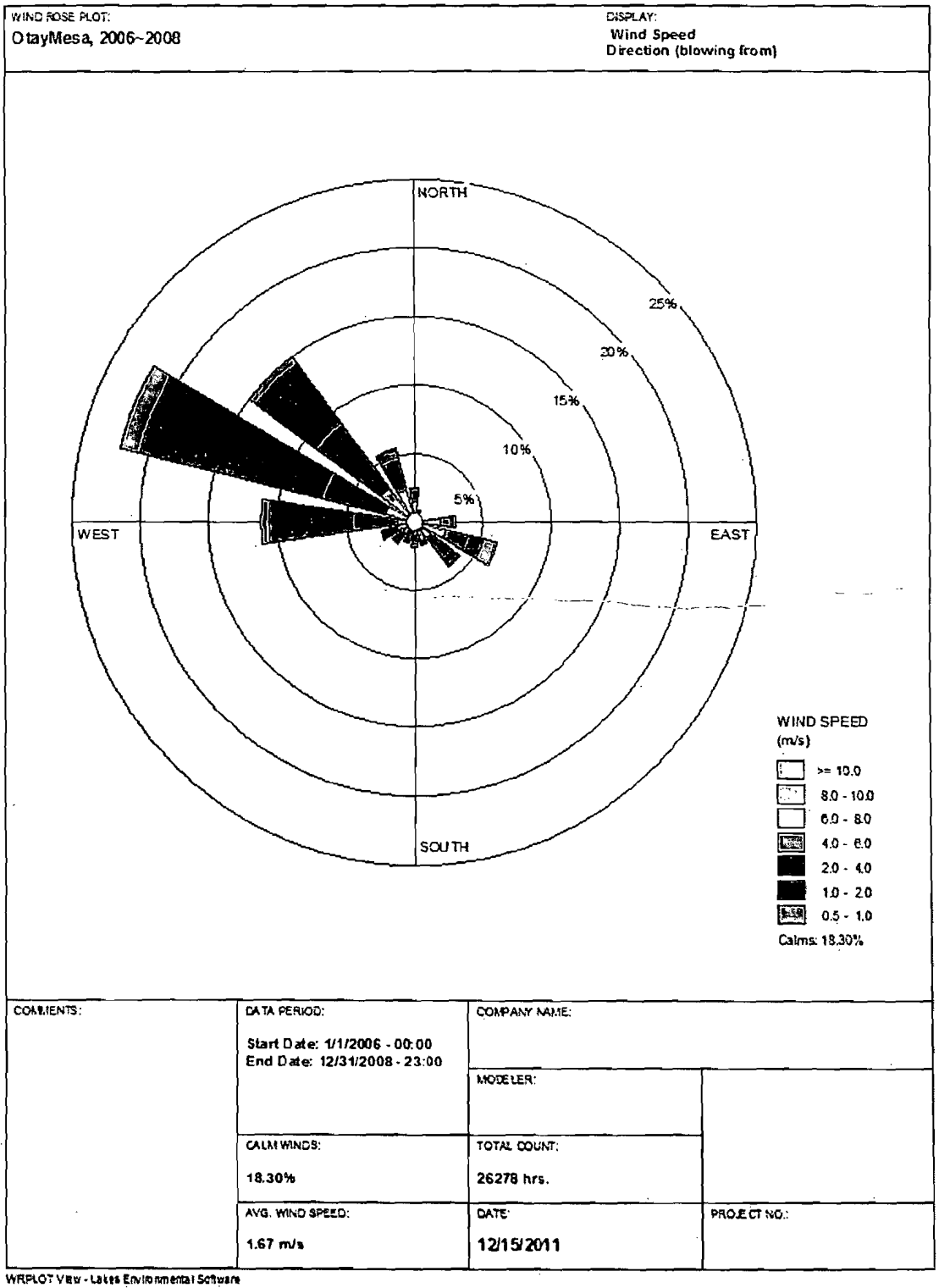
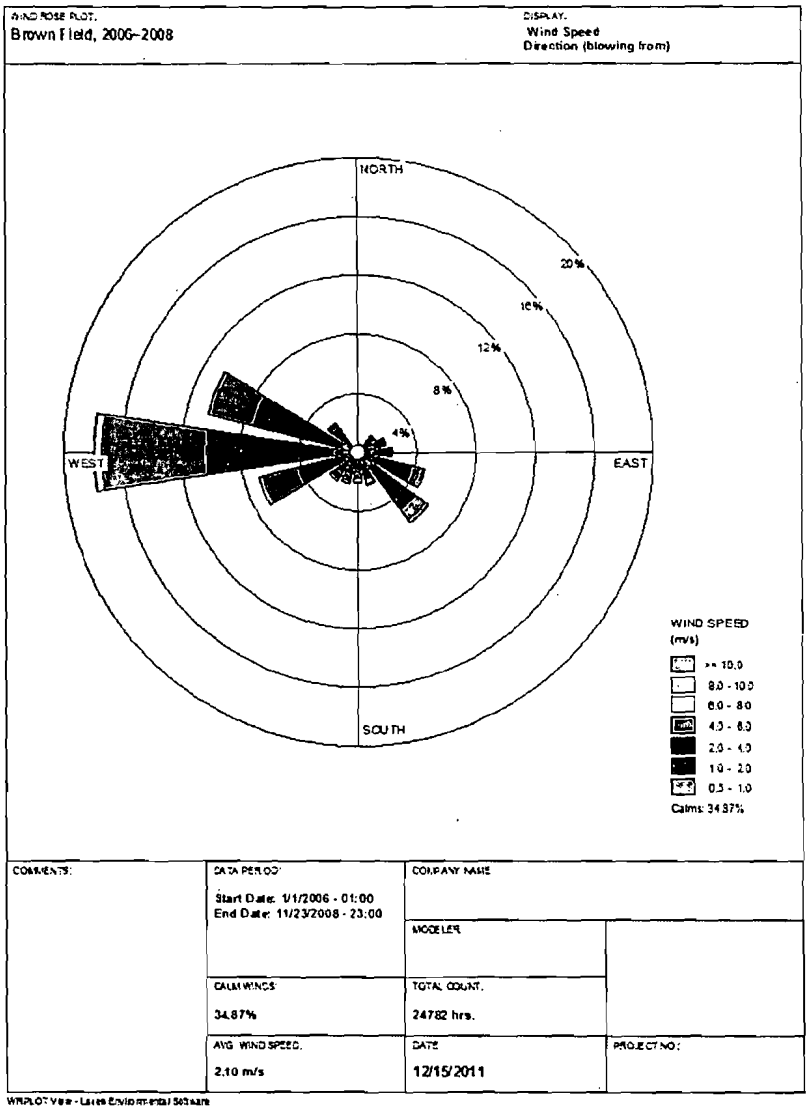


Figure 3
Wind Rose, Brown Field Meteorological Monitoring Station, 2006-2008



The surface characteristics around the Otay Mesa meteorological station at the International Border Crossing and the project site are shown in Table 1.

Table 1: Otay Mesa Meteorological Station Surface Characteristics[a]

Month	Sector	Alb	Bo	Zo[b]
1	1	0.18	1.09	0.7
2	1	0.18	1.09	0.7
3	1	0.16	0.65	0.7
4	1	0.16	0.65	0.7
5	1	0.18	0.70	0.7
6	1	0.18	0.70	0.7
7	1	0.18	0.70	0.7
8	1	0.18	0.70	0.7
9	1	0.18	0.70	0.7
10	1	0.18	1.09	0.7
11	1	0.18	1.09	0.7
12	1	0.18	1.09	0.7

Sector = 360 degrees, Alb = Albedo, Bo = Bowen Ratio, and Zo = surface roughness.

[a] Used in AERMET for AERMOD Air Dispersion Modeling.
[b] Values adjusted by SDAPCD from the AERSURFACE values of 0.2.

Table 2: "Area of Interest" Surface Characteristics[a]

Month	Sector	Alb	Bo	Zo
1	1	0.17	1.26	0.5
2	1	0.17	1.26	0.5
3	1	0.17	0.85	0.5
4	1	0.17	0.85	0.5
5	1	0.17	0.76	0.5
6	1	0.17	0.76	0.5
7	1	0.17	0.76	0.5
8	1	0.17	0.76	0.5
9	1	0.17	0.76	0.5
10	1	0.17	1.26	0.5
11	1	0.17	1.26	0.5
12	1	0.17	1.26	0.5

Sector = 360 degrees, Alb = Albedo, Bo = Bowen Ratio, and Zo = surface roughness.

[a] Area immediately east of project site. Values generated using AERSURFACE.

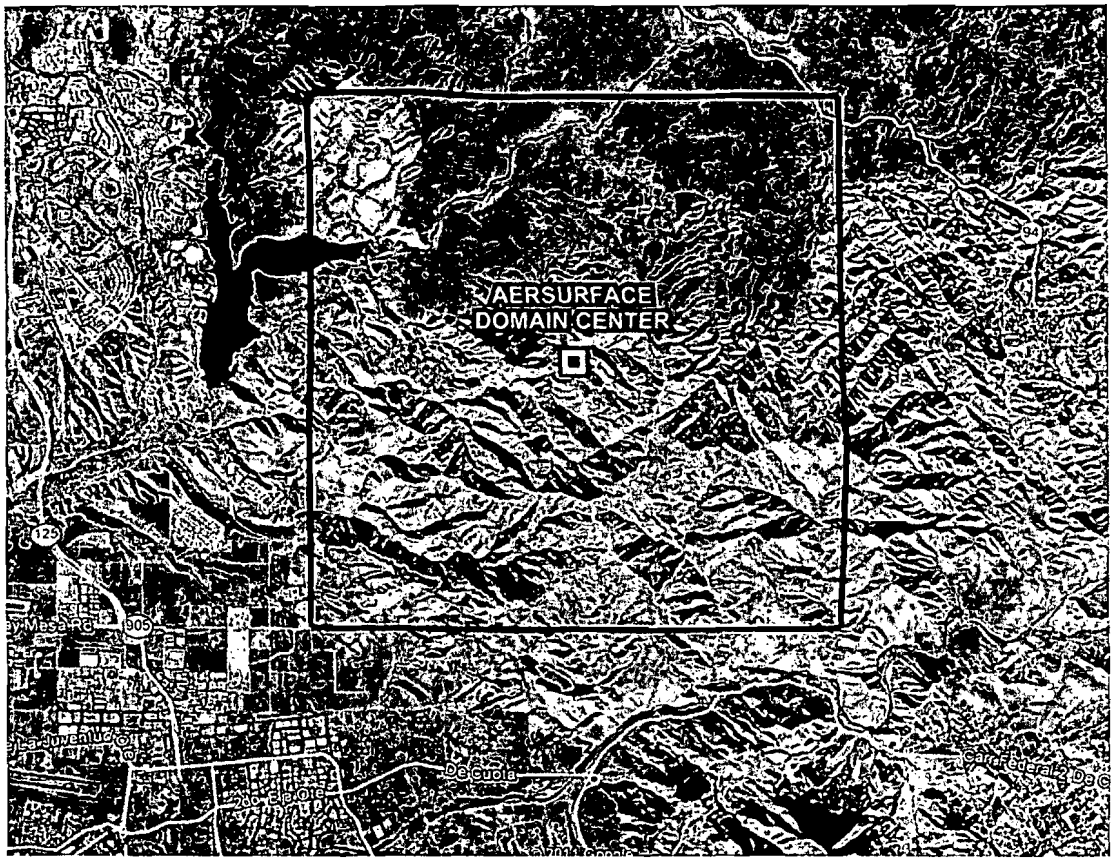
The data in Table 1 were developed by the District with guidance methodology described in its February 3, 2011 email (see Attachment D), as follows:

> *The recommended approach for processing digitized land cover data to determine the effective Bowen ratio and Albedo for input to AERMET is to average the surface characteristics across a representative domain without any direction or distance dependency. The recommended default domain is a 10km by 10km region centered on the measurement site. A domain representative of the application site may be more appropriate for some applications, particularly if the majority of sources are elevated releases.*
>
> *For this project we chose to use the proposed Pio Pico facility location as the center of the domain used in determination of the Bowen Ratios and Albedos on a monthly basis since the proposed facility is comprised of elevated sources. AERSURFACE was used for this purpose. We modify the seasonal categories for San Diego County for input to the AERSURFACE program as follows:*
>
> - *Transitional Spring: March and April*
> - *Midsummer: May, June, July, August, September*
> - *Autumn with unharvested cropland: October, November, December, January, February*
>
> *Since AERSUFACE currently uses a Land Use data base from 1992, and does not take buildings in to account, we then modified the Surface Roughness value determined for the actual Meteorological tower location (SDAPCD Otay monitoring station), which is located approximately 1.8 miles SW of the proposed facility site. The value obtained using AERSURFACE was approximately 0.2. We replaced this with a Surface Roughness value of 0.7 based on a review of aerial photos for the area. We feel that this better represents the vicinity of the Meteorological tower as a light industrial and residential area that includes northern Mexico and the U.S border area.*[2]

For comparison, average surface characteristics were developed using AERSURFACE for the 10 km by 10 km analysis domain with its western border near the project site, and its southeast corner close to the U.S.-Mexico border (see Figure 4). This domain covers most of the significant impact area, including the areas with the highest impacts. It therefore best represents the "area of interest" for the project. The results are shown in Table 2.

[2] Email from Ralph DeSiena (District) to Eric Walther (Sierra Research), February 3, 2011.

Figure 4
Location of Domain Representing Area of Interest
for Surface Characteristic Analysis



Surface characteristics affect modeling results.[3] As shown in Tables 1 and 2, the albedos for the two domains are very similar (0.16 - 0.18 for the Otay Mesa meteorological station, and 0.17 for the area of interest). The Bowen Ratios in Table 2 are consistently slightly higher than the Bowen Ratios in Table 1, reflecting a small difference between surface moisture present in the light industrial and residential area surrounding the Otay Mesa Station and in the relatively uniform sparse desert ground cover/vegetation that characterizes the area of interest. The higher the Bowen Ratio, the dryer the ground surface, and the less latent heat transfer contributes to overall heat flux from convective turbulence (i.e., the more sensible heat transfer contributes to overall heat flux from convective turbulence). Increasing this surface characteristic causes a small increase in the calculated ground-level concentration.[4] The surface roughness difference between 0.7 and 0.5 meters in the two tables, respectively, is similar, with both values determined to be in the same Category 2 (medium roughness) according to the Texas Commission on Environmental Quality.[5] For 35 meter stacks, the higher the surface roughness, the higher the concentration.

In summary, the albedo for the meteorological station is essentially the same for the area of interest; the Bowen Ratios at the meteorological station are consistently lower than for the area of interest, which would tend to lower maximum modeled concentrations; and the surface roughness is higher at the meteorological station than for the area of interest, which would tend to increase modeled concentrations. **Overall, comparison of the surface characteristics at the meteorological monitoring site with the surface characteristics in the area of interest supports the use of the Otay Mesa border station meteorological data as representative.**

Using EPA guidance as a basis, the factors listed below were considered in the determination of representativeness:

- *In general, the representativeness of the meteorological data used in an air quality modeling analysis is dependent on the proximity of the meteorological monitoring site to the "area-of-interest."* As previously indicated, the source of the meteorological data used in this analysis is two miles from the project site away with no intervening structures, hills, or water bodies that might significantly affect meteorological conditions. **Factor weighs in favor of considering the data representative.**

- *Spatial representativeness of the data will almost always be adversely affected (degraded) by increasing the distance between the sources and receptors (increasing the size of the area-of-interest).* This is inevitable in a steady-state

[3] The qualitative description of the effects of surface characteristics on modeling results are from T.G. Grosch and R.F. Lee, "Sensitivity of the AERMOD Air Quality Model to the Selection of Land Use Parameters," http://www.environmental-expert.com/Files%5C20658%5Carticles%5C4842%5Ctp_wessex99.pdf

[4] Grosch and Lee. Ibid.

[5] Texas Commission on Environmental Quality, "AERMOD Training," *http://www.cabq.gov/airquality/pdf/tceqsfcroughnessguidance.pdf*, accessed December 22, 2011.

model, and provides no basis for distinguishing between one set of data and another. **Factor is neutral with regard to considering the data representative.**

- *Although proximity of the meteorological monitoring site is an important factor, representativeness is not simply a function of distance. In some instances, even though meteorological data are acquired at the location of the pollutant source, they may not correctly characterize the important atmospheric dispersion conditions; e.g., dispersion conditions affecting sources located on the coast are strongly affected by off-shore air/sea boundary conditions - data collected at the source would not always reflect these conditions.* The source of meteorological data, the project site, and the area-of-interest are all located well inland, in close proximity to each other, and have surface characteristics that are similar to each other. **Factor weighs in favor of considering the data representative.**

- *Representativeness is a function of the height of the measurement. For example, one can expect more site-to-site variability in measurements taken close to the surface compared to measurements taken aloft. As a consequence, upper-air measurements are generally representative of much larger spatial domains then are surface measurements.* The meteorological sensors at the Otay Mesa monitoring station are located at the 10 meter (32.8 feet) standard height. The sensors therefore provide wind speed, wind direction, and temperatures that appropriately characterize a realistic boundary layer near the monitoring station and throughout the analysis domain that includes the Project site. **Factor weighs in favor of considering the data representative.**

- *Factors that should be considered in selecting a monitoring site in complex terrain include: the aspect ratio and slope of the terrain, the ratios of terrain height to stack height and plume height, the distance of the source from the terrain feature, and the effects of terrain features on meteorological conditions, especially wind speed and wind direction.* The Project site is somewhat closer to the San Ysidro Mountains to the east than is the Otay Mesa monitoring station. The San Ysidro Mountains have maximum elevations around 2,000 feet. The wind roses in Figures 2 and 3 and the wind roses for Chula Vista and El Cajon contained included as Figures 1 and 2, respectively, in our December 1, 2011 letter all show the dominance of the westerly sea breezes throughout this region west of the mountains. The fact that the mountains are downwind of both the Project site and the monitoring station almost all of the time assures that effects of the elevated terrain in the mountains on the monitored values of wind speed and direction are likely to be similarly minimal for both sites. **Factor weighs in favor of considering the data representative.**

In summary, consideration of the factors listed in EPA guidance on determination of the representativeness of meteorological data results in the conclusion that the Otay Mesa data are adequately representative of the area of interest for this Project. Furthermore, any objections that might be raised concerning the Otay Mesa data would be equally applicable to data that might be collected onsite. Therefore, there is no basis for requiring collection of onsite meteorological data.

In-Stack NO_2/NOx Ratio

Comment: *Provide the documents that were used to derive the in-stack NO_2NOx ratios for the NO_2 modeling analysis.*

Response: At the direction of the District, the NO_2/NOx ratios used for PPEC in the dispersion modeling were revised to 13% during normal operations and 24% during startup and commissioning. The District justified those levels in an email[6] to the applicant as follows:

> *The tentative recommendation for normal operations is based on source tests of four natural-gas-fired LM6000PC SPRINT turbines equipped with water injection, SCR, and oxidation catalysts. Preliminarily, these appear to be the closest analogue to the LMS100 as proposed for Pio Pico (i.e., aeroderivative, simple cycle, diffusion flame combustors, same NOx controls, oxidation catalysts, and interstage cooling—albeit with water injection for the SPRINTs). The value is an average over the four turbines (rounded up) of the average NO2/NOx ratio for each turbine. The average NO2/NOx ratios for the four turbines were .0393 (2 tests), .0603 (2 tests), 0.185 (1 test), and 0.205 (1 test), respectively.*
>
> *For situations when the SCR is not operating, the tentative ratio is based on source tests of 11 natural-gas-fired GE Frame 5 turbines. These turbines all have water injection but no other NOx controls and no oxidation catalyst. The NO2/NOx ratio for these turbines ranges from about 0.18 to 0.285 (averaged over 7-10 source tests of each turbine).*
>
> *The source tests were all at greater than 80% load.*

The Pacific Recovery NO_2/NOx ratio of 75% was taken from source test data for the facility. The data were provided by the District to be used for this analysis (see Attachment B). Over four test runs, average NO_2/NOx ratios ranged from 55% to 75%. For the cumulative impact analysis, the applicant selected the most conservative average value to characterize this source.

The Otay Mesa NO_2/NOx ratio of 5% was taken from source test data for the Otay Mesa facility. The data were provided by the District to be used for this analysis (see Attachment C). The NO_2/NOx ratio ranged from 4% to 6% with the duct burners, and 4% to 7% without duct burners. For the cumulative impact analysis, the applicant selected a round number within the range.

The NO_2/NOx ratios for the small Calpeak Boarder and Larkspur units (all 10%) were based on a conservative interpretation of data provided by the District (see Attachment C).

---

[6] See the December 23, 2010 email from Steve Moore to Steve Hill provided in Attachment A.

PM BACT for Turbines

Comment: *Provide the data from the Panoche Energy Center project used to develop the proposed turbine PM BACT emission level of 5.5 lb/hr.*

Response: The Panoche Energy Center source test data are summarized in Table 3. Please note that these few source tests are not sufficient to demonstrate that the measured emission rates are achievable under all conditions and for the lifetime of the turbines. Furthermore, the test method used to measure PM is not very accurate at the low levels being measured; there is considerable variability in the results. For these reasons, the applicant has proposed a compliance level that takes into account (a) the vendor guarantee; (b) the emission levels demonstrated in the source tests; (c) reasonable variability in performance that can be expected over the lifetime of a well-maintained unit; and (d) the variability inherent in the source test methodology.

Taking all of the above into account, test results provide sufficient support for the Applicant to determine that it can comply with a 5.5 lb/hr emission limit, which is equivalent to 0.0065 lb/MMBtu measured at or near peak turbine load.

Source test reports and/or summaries are included on the enclosed CD.

Table 3. Panoche Energy Center
PM Emission Tests Results (lb/MMBtu)
4 x 100 MW GE Model LMS100 combustion turbines

Date	5/13/2011	5/12/2011	5/11/2011	5/10/2011	5/11/2010	5/12/2010	5/18/2010	5/19/2010	4/30/09 - 5/1/09	4/27/2009	4/23/2009	4/24/2009
Unit	1	2	3	4	1	2	3	4	1	2	3	4
Unit Load									100%	100%	100%	100%
Run 1	0.00298	0.00402	0.00314	0.00184	0.00279	0.00141	0.00168	0.00249	0.002	0.005	0.012	0.002
Run 2	0.00261	0.00192	0.00420	0.00182	0.00213	0.00107	0.00176	0.00198	0.002	0.003	0.002	0.007
Run 3	0.00167	0.00169	0.00605	0.00185	0.00169	0.00155	0.00149	0.00310	0.004	0.001	0.002	0.006
Average	0.00242	0.00254	0.00446	0.00184	0.00220	0.00134	0.00164	0.00252	0.003	0.003	0.005	0.005

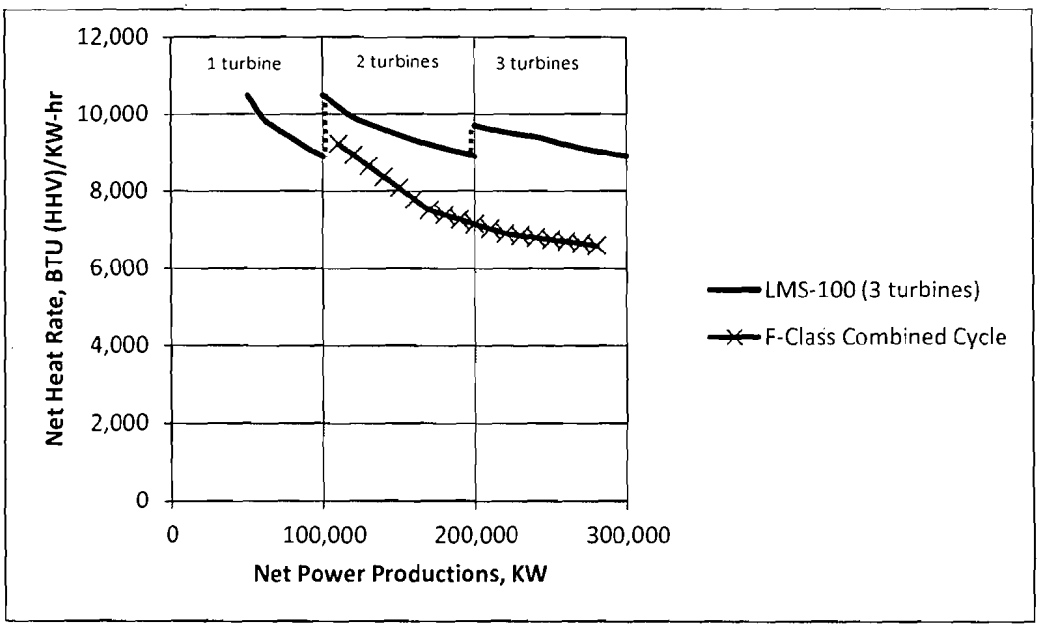
	2011	2010	2009	Overall
Average	0.00282	0.00193	0.004	0.003
Std Deviation	0.00136	0.00060	0.003	0.002
Relative Std Deviation	48%	31%	78%	73%
Mean plus 2 S.D	0.0055	0.0031	0.0103	0.0072

GHG BACT for Turbines

Comment: *In Step 4 of the BACT analysis, Applicant made the following statement: "A larger-capacity unit would be operated at less than optimum (full) output more frequently than a smaller-capacity turbine, and since gas turbine efficiency drops rapidly at less than full load, this mode of operation would likely reduce the overall efficiency of the combined-cycle units to below that of the proposed simple-cycle gas turbines." Please provide the basis for this claim.*

Response: As shown in Figure 5, turbine efficiency drops rapidly at less than full load. A single, high-efficiency combined-cycle unit (such as an F-class unit in a 1x1 configuration) cannot effectively operate through the broad range of loads that multiple simple-cycle units can.[7] Figure 5 compares the efficiency curves for the proposed LMS100 configuration with an F-class combined cycle unit (GE S107FB). It is important to note that while the LMS100 configuration provides the flexibility to operate across the full range of loads between approximately 50 MW and 300 MW, it will most likely be dispatched to operate at the more efficient loads of 100 MW, 200 MW or 300 MW.

Figure 5
Turbine Efficiency Curves



[7] As designed, PPEC is capable of providing load-following capability from a minimum of 50 MW up to its full capacity of 300 MW. The GE S107FB is limited to a range of approximately 110-280 MW. The broader range of response is an important feature of PPEC's proposal to SDG&E.

If you have any questions regarding this information, please contact the Applicant's representative David Jenkins at (317) 431-1004, or Gary Rubenstein or me at (916) 444-6666.

Sincerely,

Steve Hill

cc: John McKinsey, Stoel Rives LLP
David Jenkins, Apex Power Group
Steve Moore, San Diego Air Pollution Control District

Attachments
Enclosure: CD

ATTACHMENT A

December 23, 2010 Email from Steve Moore to Steve Hill

Steve Hill

From: Moore, Steve <Steve.Moore@sdcounty.ca.gov>
Sent: Thursday, December 23, 2010 2:36 PM
To: Steve Hill
Cc: Eric Walther
Subject: RE: Pio Pico NO2/NOx

Follow Up Flag: Follow up
Flag Status: Completed
Expires: Sunday, December 20, 2020 12:00 AM

Steve,

The tentative recommendation for normal operations is based on source tests of four natural-gas-fired LM6000PC SPRINT turbines equipped with water injection, SCR, and oxidation catalysts. Preliminarily, these appear to be the closest analogue to the LMS100 as proposed for Pio Pico (i.e., aeroderivative, simple cycle, diffusion flame combustors, same NOx controls, oxidation catalysts, and interstage cooling—albeit with water injection for the SPRINTs). The value is an average over the four turbines (rounded up) of the average NO2/NOx ratio for each turbine. The average NO2/NOx ratios for the four turbines were .0393 (2 tests), .0603 (2 tests), 0.185 (1 test), and 0.205 (1 test), respectively.

For situations when the SCR is not operating, the tentative ratio is based on source tests of 11 natural-gas-fired GE Frame 5 turbines. These turbines all have water injection but no other NOx controls and no oxidation catalyst. The NO2/NOx ratio for these turbines ranges from about 0.18 to 0.285 (averaged over 7-10 source tests of each turbine).

The source tests were all at greater than 80% load.

Thanks.

Steven Moore
Senior Air Pollution Control Engineer
San Diego County Air Pollution Control District
10124 Old Grove Road, San Diego, CA 92131

858-586-2750

Celebrating 50 years of air quality progress!

From: Steve Hill [mailto:SHill@sierraresearch.com]
Sent: Thursday, December 23, 2010 1:48 PM
To: Moore, Steve; Eric Walther
Cc: Gary Rubenstein
Subject: RE: Pio Pico NO2/NOx

Thank you for the guidance.

Can you please provide the justification for using those values? We need to be able to explain to EPA the basis for any value that we use. We can refer to San Joaquin's published guidance for a ratio of 0.10, but have been unable to find source test data to support a different value.

--Steve

From: Moore, Steve [mailto:Steve.Moore@sdcounty.ca.gov]
Sent: Thursday, December 23, 2010 1:16 PM
To: Steve Hill; Eric Walther
Subject: Pio Pico NO2/NOx

Steve & Eric,

For purposes of the AQIA in a submittal of a new or revised application for the Pio Pico Energy Center, the District tentatively recommends the following in-stack NO2/NOx ratios for the LMS100 turbine proposed for the project:

Normal Operations: 0.13
Commissioning, Startup, or any other situation when the SCR is not fully operational: 0.24

Please be aware that the District is continuing to investigate this issue and reserves the right to change these tentative recommendations based on reevaluation of existing information or new information.

Thanks.

Steven Moore
Senior Air Pollution Control Engineer
San Diego County Air Pollution Control District
10124 Old Grove Road, San Diego, CA 92131

858-586-2750

Celebrating 50 years of air quality progress!

ATTACHMENT B

Pacific Recovery Test Data

NO2 Priority	PO_NUM	ID_NUM	DBA	EQUIP_DESC	Mfg	Model
1	40247-1	6068	Pacific Recovery, Otay Landfill, Eng @1	One Cooper Superior model 16SGTA pre-chamber lean burn piston engine, rated at 2650 bhp at 900 rpm. Fueled with landfill gas from a landfill gas collection system consisting of 62 wells and associated landfill gas venting system which also supplies fuel to engine #2.	Cooper	16SGTA
1	40247-2	6068	Pacific Recovery, Otay Landfill, Eng #2	One Cooper Superior model 16SGTA pre-chamber lean burn piston engine, rated at 2650 bhp at 900 rpm. Fueled with landfill gas from a landfill gas collection system consisting of 62 wells and associated landfill gas venting system which also supplies fuel to engine #1.	Cooper	16SGTA
1	979979-3	6068	Pacific Recovery, Engine #3, Otay Landfill	One Cooper Superior model 16SGTA pre-chamber lean burn piston engine, rated at 2650 bhp at 900 rpm. Fueled with landfill gas from a landfill gas collection system consisting of 62 wells and associated landfill gas venting system which also supplies fuel to engine #1	Cooper	16SGTA
1	979979-4	6068	Pacific Recovery, Engine #4, Otay Landfill	One Cooper Superior model 16SGTA pre-chamber lean burn piston engine, rated at 2650 bhp at 900 rpm. Fueled with landfill gas from a landfill gas collection system consisting of 62 wells and associated landfill gas venting system which also supplies fuel to engine #1	Cooper	16SGTA

TC = Turbocharged
AC = Aftercooled
4DR = Timing retarded by 4 degrees
DPF Diesel Particulate Filter
SCR = Selective Catalytic Reduction
OxCat = Oxidation Catalyst
LB = Lean Burn
LFG = Landfill Gas

BHP	Spark Ignited Engine Type	Turbocharged	Aftercooled	Timing	Diesel Particulate Filter	Add-on NOx Control	In-Combutor NOx Control	CO/VOC Control	Fuel	No. Tests	Average NOx, ppmv @ 15% O2	Average NO2/NOx
2650	LB	—	—	—	—	—	—	—	LFG	10	56.93	54.98
2650	LB	—	—	—	—	—	—	—	LFG	8	59.31	55.51
2650	LB	—	—	—	—	—	—	—	LFG	2	23.70	74.85
2650	LB	—	—	—	—	—	—	—	LFG	3	30.30	56.37

Maximum NO2/NOx	Minimum NO2/Nox	NO2/NOx Standard Deviation	Average Load, %
67.9	5.1	18.13075	97.5%
71.2	6.6	20.77605	97.5%
78.2	71.5	4.737615	97.4%
72.3	33.8	20.08889	95.5%

ATTACHMENT C

Turbine Test Data

NO2 Priority	D_NUM	M_DBA	PO_NUM	EQUIP_DESC
1	7630	WILDFLOWER ENERGY LP/LARKSPUR	976094	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 100 (WEST UNIT) THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDES POWER FROM UNIT 100 AND UNIT 200 IS 90 MW. 976094 EAD 01/06/03 (982160 11/04) 976138 AND 976094 04/20/05 (981537 04/05) 983806 12/29/05 EAD
1	7630	WILDFLOWER ENERGY LP/LARKSPUR	976138	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 200 (EAST UNIT). THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDING THE POWER FROM UNIT 100 AND UNIT 200 IS 90 MW 976094 AND 976136 EAD 1/6/03 (982160 11/04) 979094 AND 976136 EAD 4/20/05 (981537 04/20/05) 983806 EAD 12/29/05
1	7835	CALPEAK POWER LLC	976502	GAS TURBINE (49.5 MW): PRATT & WHITNEY, MODEL FT-8 (DLN), TWIN-PAC (TWO SIMPLE CYCLE GAS TURBINES WITH COMMON GENERATOR AND EXHAUST), 500 MMBTU/HR TOTAL HEAT INPUT, NATURAL GAS FIRED, WITH EXHAUST AIR COOLING, A PEERLESS MANUFACTURING COMPANY SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM WITH A HALDOR CATALYST, AN ENGELHARD OXIDATION CATALYST SYSTEM, A CONTINUOUS EMISSION MONITORING SYSTEM (CEMS), AND CONTINUOUS PARAMETRIC MONITORS. (976502AFS11JUL2002)(978638 ALC 09/04)(983962 & 984416 EAD 6/07/07)
1A	86017	CA ST OF DEPT (	860159	ONE(1) SOLAR CENTAUR GSC 4500 COMBUSTION TURBINE MODEL GS1-CB-KA, SERIAL NUMBER CG86N28; ELECTRICL GENRATOR RATED AT 2.93 MW; WASTE HEAT RECOVERY; ONE (1) COEN MODEL GDB-300 DUCT BURNER MODIFIED FOR MAXIMUM HEAT INPUT OF 16 MM BTU/HR WITH A BYPASS VALVE AND SECONDARY EXHAUST, WHICH ALLOWS THE EXHAUST TO BYPASS THE DUCTBURNER/HEAT RECOVERY BOILER. APP.#910523 RLB 5/25/93 (9/24/02 COMPLIANCE REQUESTED EQ. DESC. CHANGE-AFS)
1A		OTAY MESA ENE	978379	Power Station #1 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.
1A		OTAY MESA ENE	978380	Power Station #2 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.

DB = Duct Burner
Comb = Combined cycle including combined heat and power (i.e., cogeneration)
Simple = simple cycle
DF = Diffusion Flame
LPM = Lean Premixed
Aero = Aeroderivative
Ind = Industrial
SCR = Selective Catalytic Reduction
WI = Water Injection
OxCat = Oxidation Catalyst

M_DBA	PO_NUM	EQUIP_DESC	Mfg.	Model	Type	Turbine Rated Power Output, MW	Turbine Rated Heat Input (HHV), MMBtu/hr	Combustor	Duct Burner	Duct Burner Rated Heat Input, MMBtu	DB Combustor	Rated DB Heat Input (HHV), MMBTu /hr	Cycle	Add-on NOx Control	In-Combustor NOx Control	CO/VOC Control	No. Tests Fired on Natural Gas with DB On	NG DB On Average NOx, ppmv @ 15% O2	Natural Gas DB On Average NO2/NOx	Natural Gas DB On Maximum NO2/NOx	Natural Gas DB On Minimum NO2/NOx	Natural Gas DB On NO2/NOx Standard Deviation	Natural Gas DB On Average Load, %	No. Tests Fired on Natural Gas with DB Off	NG DB Off Average NOx, ppmv @ 15% O2	Natural Gas DB Off Average NO2/NOx	Natural Gas DB Off Maximum NO2/NOx	Natural Gas DB Off Minimum NO2/NOx
WILDFLOWER ENERGY LP/LARKSPUR	976094	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 100 (WEST UNIT) THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDES POWER FROM UNIT 100 AND UNIT 200 IS 90 MW. 976094 EAD 01/06/03 (982160 11/04) 976138 AND 976094 04/20/05 (981537 04/05) 983806 12/29/05 EAD	GE	LM6000PC SPRINT	Aero	45	395	DF	—	—	—	—	Simple	SCR.	WI	—	0	N/A	N/A	N/A	N/A	N/A	N/A	3	5.16	14.07	17.00	9.30
WILDFLOWER ENERGY LP/LARKSPUR	976138	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 200 (EAST UNIT). THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDING THE POWER FROM UNIT 100 AND UNIT 200 IS 90 MW 976094 AND 976136 EAD 1/6/03 (982160 11/04) 979094 AND 976136 EAD 4/20/05 (981537 04/20/05) 983806 EAD 12/29/05	GE	LM6000PC SPRINT	Aero	45	395	DF	—	—	—	—	Simple	SCR.	WI	—	0	N/A	N/A	N/A	N/A	N/A	N/A	2	4.74	9.60	16.30	2.90
CALPEAK POWER LLC	976502	GAS TURBINE (49.5 MW): PRATT & WHITNEY, MODEL FT-8 (DLN), TWIN-PAC (TWO SIMPLE CYCLE GAS TURBINES WITH COMMON GENERATOR AND EXHAUST), 500 MMBTU/HR TOTAL HEAT INPUT, NATURAL GAS FIRED, WITH EXHAUST AIR COOLING, A PEERLESS MANUFACTURING COMPANY SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM WITH A HALDOR CATALYST, AN ENGELHARD OXIDATION CATALYST SYSTEM, A CONTINUOUS EMISSION MONITORING SYSTEM (CEMS), AND CONTINUOUS PARAMETRIC MONITORS. (976502AFS11JUL2002)(978638 ALC 09/04)(983962 & 984416 EAD 6/07/07)	PW	FT-8	Aero	49.5	500	LPM	—	—	—	—	Simple	SCR.	—	OxCat	0	N/A	N/A	N/A	N/A	N/A	N/A	2	2.93	10.52	14.60	6.43
CA ST OF DEPT (	860159	ONE(1) SOLAR CENTAUR GSC 4500 COMBUSTION TURBINE MODEL GS1-CB-KA, SERIAL NUMBER CG86N28; ELECTRICL GENRATOR RATED AT 2.93 MW; WASTE HEAT RECOVERY; ONE (1) COEN MODEL GDB-300 DUCT BURNER MODIFIED FOR MAXIMUM HEAT INPUT OF 16 MM BTU/HR WITH A BYPASS VALVE AND SECONDARY EXHAUST, WHICH ALLOWS THE EXHAUST TO BYPASS THE DUCTBURNER/HEAT RECOVERY BOILER. APP.#910523 RLB 5/25/93 (9/24/02 COMPLIANCE REQUESTED EQ. DESC. CHANGE-AFS)	SOLAR	GSI-CB-KA	Ind	2.93		DF	DB	16		16	Comb	—	WI	—	5	21.50	49.64	69.60	34.10	14.85	85.35	0	N/A	N/A	N/A	N/A
OTAY MESA ENE	978379	Power Station #1 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.	GE	7FA	Ind	171.7	1607.1	LPM	DB	388.1		388.1	Comb	SCR	—	—	2	1.51	5.33	6.13	4.53	1.13	130.46	2	1.55	6.97	7.33	6.60
OTAY MESA ENE	978380	Power Station #2 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.	GE	7FA	Ind	171.7	1607.1	LPM	DB	388.1		388.1	Comb	SCR	—	—	2	1.48	4.06	4.26	3.87	0.28	128.70	1	1.46	3.87	3.87	3.87

:d cycle including combined heat and power (i.e., cogeneration)
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M_DBA	PO_NUM	EQUIP_DESC	Natural Gas DB Oil NO2/NOx Standard Deviation	Natural Gas DB Oil Average Load, %	No. Tests Fired on Diesel Oil	Oil Average NOx ppmv @ 15% O2	Oil Average NO2 NOx	Oil Maximum NO2 NOx	Oil Minimum NO2 NOx	Oil NO2 NOx Standard Deviation	Oil Average Load, %	Notes
WILDFLOWER ENERGY LP/LARKSPUR	976094	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 100 (WEST UNIT) THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDES POWER FROM UNIT 100 AND UNIT 200 IS 90 MW. 976094 EAD 01/06/03 (982160 11/04) 976138 AND 976094 04/20/05 (981537 04/05) 983806 12/29/05 EAD	4.16	101.41	1	11.10	5.70	5.70	5.70	#DIV/0!	98.22	
WILDFLOWER ENERGY LP/LARKSPUR	976138	ONE (1) GENERAL ELECTRIC 45 MW NOMINALLY RATED MODEL LM 6000 PC SPRINT SIMPLE CYCLE GAS TURBINE WITH A HEAT INPUT RATING OF 395 MM BTU/HR (LHV) WHEN OPERATED ON NATURAL GAS AND 398 MM BTU/HR (LHV) WHEN OPERATED ON LIQUID FUEL, EQUIPPED WITH A WATER INJECTION SYSTEM AND CORMETECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM INCLUDING AUTOMATIC AMMONIA INJECTION CONTROL SYSTEM FOR CONTROL OF NOX, CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS), DATA ACQUISITION AND RECORDING SYSTEMS AND THE OPTION OF AN OXIDATION CATALYST SYSTEM: UNIT 200 (EAST UNIT). THE COMBINED TOTAL ELECTRICAL NOMINAL POWER OUTPUT FROM THE LARKSPUR POWER PLANT, INCLUDING THE POWER FROM UNIT 100 AND UNIT 200 IS 90 MW 976094 AND 976136 EAD 1/6/03 (982160 11/04) 979094 AND 976136 EAD 4/20/05 (981537 04/20/05) 983806 EAD 12/29/05	9.48	103.11	1	12.10	2.80	2.80	2.80	#DIV/0!	100.00	
CALPEAK POWER LLC	976502	GAS TURBINE (49.5 MW): PRATT & WHITNEY, MODEL FT-8 (DLN), TWIN-PAC (TWO SIMPLE CYCLE GAS TURBINES WITH COMMON GENERATOR AND EXHAUST), 500 MMBTU/HR TOTAL HEAT INPUT, NATURAL GAS FIRED, WITH EXHAUST AIR COOLING, A PEERLESS MANUFACTURING COMPANY SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM WITH A HALDOR CATALYST, AN ENGELHARD OXIDATION CATALYST SYSTEM, A CONTINUOUS EMISSION MONITORING SYSTEM (CEMS), AND CONTINUOUS PARAMETRIC MONITORS. (976502AFS11JUL2002)(978638 ALC 09/04)(983962 & 984416 EAD 6/07/07)	5.77	95.96	0	N/A	N/A	N/A	N/A	N/A	N/A	
CA ST OF DEPT (	860159	ONE(1) SOLAR CENTAUR GSC 4500 COMBUSTION TURBINE MODEL GS1-CB-KA, SERIAL NUMBER CG86N28; ELECTRICL GENRATOR RATED AT 2.93 MW; WASTE HEAT RECOVERY; ONE (1) COEN MODEL GDB-300 DUCT BURNER MODIFIED FOR MAXIMUM HEAT INPUT OF 16 MM BTU/HR WITH A BYPASS VALVE AND SECONDARY EXHAUST, WHICH ALLOWS THE EXHAUST TO BYPASS THE DUCTBURNER/HEAT RECOVERY BOILER. APP.#910523 RLB 5/25/93 (9/24/02 COMPLIANCE REQUESTED EQ. DESC. CHANGE-AFS)	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	
OTAY MESA ENE	978379	Power Station #1 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.	0.52	133.37	0	N/A	N/A	N/A	N/A	N/A	N/A	
OTAY MESA ENE	978380	Power Station #2 consisting of: one Gas Turbine (171.7 MW nominal): General Electric, Model 7FA, with DLN 2.6 low-NOx burners, natural gas fired, 1607.1 MMBtu/hr nominal heat input (LHV), S/N TBD, with a heat recovery steam generator (HRSG) with a 388.1 MMBtu/hr duct burner, Nooter-Eriksen, vented to a selective catalytic reduction (SCR) system, equipped with a continuous emission monitoring system (CEMS); common to both power stations are a steam turbine generator (277 MW nominal), Siemans-Westinghouse, Model KN, S/N TBD; two air-cooled condensers, GEA, 295'L x 123'W x 76'H; a wet surface air cooler, Niagara Blower Co., Model RWC 48240-2F16, or equivalent; and an auxiliary boiler, 87 MMBtu/hr, with low-NOx burners.	#DIV/0!	99.59	0	N/A	N/A	N/A	N/A	N/A	N/A	

:d cycle including combined heat and power (i.e., cogeneration)
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Catalytic Reduction
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ATTACHMENT D

February 3, 2011 Email from Ralph DeSiena to Eric Walther

From: Desiena, Ralph [mailto:Ralph.Desiena@sdcounty.ca.gov]
Sent: Thursday, February 03, 2011 11:39 AM
To: Eric Walther
Cc: Moore, Steve; Reeve, Bill; Desiena, Ralph
Subject: RE: CEC request for met data on the Pio Pico Energy Center Project

Eric,

I'm attaching the Aermet data you requested for 2004 and 2005.
Also attached is the revised 2008 data, which now includes the missing end period, a little over one month, of that data.

In response to your request from CEC is the following:

The recommended approach for processing digitized land cover data to determine the effective Bowen ratio and Albedo for input to AERMET is to average the surface characteristics across a representative domain without any direction or distance dependency. The recommended default domain is a 10km by 10km region centered on the measurement site. A domain representative of the application site may be more appropriate for some applications, particularly
if the majority of sources are elevated releases.

For this project we chose to use the proposed Pio Pico facility location as the center of the domain used in determination of the Bowen Ratios and Albedos on a monthly basis since the proposed facility is comprised of elevated sources. AERSURFACE was used for this purpose. We modify the seasonal categories for San Diego County for input to the AERSURFACE program as follows:

Transitional Spring: March and April
Midsummer: May, June, July, August, September
Autumn with unharvested cropland: October, November, December, January, February

Since AERSUFACE currently uses a Land Use data base from 1992, and does not take buildings in to account, we then modified the Surface Roughness value determined for the actual Meteorological tower location (SDAPCD Otay monitoring station), which is located approximately 1.8 miles SW of the proposed facility site. The value obtained using AERSURFACE was approximately 0.2. We replaced this with a Surface Roughness value of 0.7 based on a review of aerial photos for the area. We feel that this better represents the vicinity of the Meteorological tower as a light industrial and residential area that includes northern Mexico and the U.S border area.

If you have any questions please let me know.

Regards,

Ralph

Ralph DeSiena
Air Pollution Meteorologist
San Diego County Air Pollution Control

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San Diego, CA 92131
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www.sdapcd.org