UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 13, 2010

George L. Piantka, P.E.
Carlsbad Energy Center LLC
1817 Aston Avenue, Suite 104
Carlsbad, CA 92008

Subject: PSD Determination for the Carlsbad Energy Center Power Project

Dear Mr. Piantka:

This letter is in response to your analysis submitted to the United States Environmental Protection Agency (EPA) on June 5, 2009, as well as additional information submitted to EPA to supplement this analysis. The analysis provides information on determining whether the proposed Carlsbad Energy Center Project (CECP), which will be located in the city of Carlsbad, in San Diego County, will trigger Prevention of Significant Deterioration (PSD) permit requirements.

EPA has reviewed the information submitted. Based on our review, we conclude that the CECP is not a major modification and is not subject to PSD permit requirements. Enclosed is our analysis.

If you have any questions, please contact Shaheerah Kelly of the Air Permits Office at (415) 947-4156.

Sincerely,

Deborah Jordan
Director, Air Division

Enclosures: (1) PSD Applicability Analysis for the Carlsbad Energy Center Project
(2) Attachments A, B, C, & D

cc: Robert Kard, San Diego Air Pollution Control District (w/ enclosures)
Steven Moore, San Diego Air Pollution Control District (w/ enclosures)
Tom Andrews, Sierra Research (w/ enclosures)
Mike Monasmith, California Energy Commission (w/ enclosures)
Will Walters, Aspen Environmental Group (w/ enclosures)
Joe Garuba, City of Carlsbad (w/ enclosures)

PSD Applicability Analysis for the Carlsbad Energy Center Project

I. Introduction

Carlsbad Energy Center LLC (Applicant) is proposing to modify the existing Encina Power Station (EPS) by replacing three of five existing boilers (Units 1, 2, and 3) at the facility with a net 540 MW (gross 558 MW) natural gas-fired combined cycle power plant facility called the Carlsbad Energy Center Project (CECP). Carlsbad Energy Center LLC and EPS are both indirect wholly owned subsidiaries of NRG Energy, Inc. The CECP will be located at the eastern end of the property site for the EPS in the city of Carlsbad, San Diego County, California.

The EPS currently has a total of five (5) natural gas-fired boilers (i.e., Units 1, 2, 3, 4, and 5), which are allowed to use No. 6 fuel oil during curtailments, and three fuel oil storage tanks. The CECP will consist of two rapid startup natural gas-fired combustion turbine generators (CTGs) and a 246-horsepower diesel emergency fire-pump engine. The two new CTG units will be designated Units 6 and 7, and will be located at the same location as the fuel oil tanks, which will also be removed. Since the EPS is an existing major source, and the CECP is a physical change to the facility, the Applicant must show whether the net emission increases for pollutants regulated under the Prevention of Significant Deterioration (PSD) permit program will result in a major modification that is subject to PSD major modification permit requirements.

On September 14, 2007, the Applicant filed an application for certification (AFC) with the California Energy Center (CEC) to obtain a license from the state agency. The AFC contained a PSD analysis that evaluated whether the change resulted in a major modification. The emissions estimates were based on the increase in potential emissions from the proposed CECP and the decrease in actual emissions from removing Units 1, 2, and 3.

For electric utility steam generating units (EUSGU), such as the units at the EPS, the PSD calculation methodology allows the use of any consecutive 24-month period during the 5-year period immediately preceding the date that construction of the project starts to determine baseline actual emissions. However, if the facility demonstrates that a 24-month period outside of the 5-year window is more representative of normal operations, EPA allows this alternative period to be used to determine baseline actual emissions. The AFC projected construction of the project to occur in the fourth quarter of 2008 and used calendar years 2002 and 2003 as the 24-month baseline period for nitrogen oxides (NOx), carbon monoxide (CO), and sulfur oxides (SOx), and calendar years 2004 and 2005 for volatile organic compounds (VOC) and particulate matter less than 10 microns (PM10). The Applicant's original analysis showed the project did not trigger a PSD major modification and a PSD permit was not required prior to proceeding with the CECP.[1]

[1] Based on EPA's informal review of the AFC in June 2008, the agency did not formally comment or object to this conclusion that the Project was not subject to PSD review.

In November 2008, the San Diego Air Pollution Control District (District) issued, for public comment and review, the preliminary determination of compliance (PDOC) for the CECP. The District issued the final determination of compliance (FDOC) on August 4, 2009. As of the date of this analysis, the CEC had not yet approved the AFC for CECP and the project's construction schedule has shifted to a later date which is dependent upon CEC license approval. Between the time of the issuance of the PDOC and FDOC, EPA received correspondence from community members and the City of Carlsbad, which had also received several calls from community members, requesting that the EPA require that the Applicant perform an updated analysis based on the new projected construction date since it had shifted by more than a year (from 2008 to 2010), which in turn may affect the baseline actual emission calculations.

On June 5, 2009, the Applicant submitted an analysis to EPA for determining whether PSD review applies to the CECP. The Applicant submitted additional information to EPA between the months of August 2009 and September 2010. Although the Applicant projected construction to start in early 2010, we will base our determination of PSD applicability on a conservative estimate of June 30, 2011, the expected actual construction date of the project. If the project has not begun construction by this time, a new analysis and determination will be required.

In its analysis, the Applicant requested use of an alternative 24-month period outside of the 5-year lookback period for calculating baseline actual emissions. Specifically, the Applicant requested to use a consecutive 24-month period of calendar years 2004 and 2005 because they are used in the District's PDOC and FDOC.[2] In 2009, the Applicant revised the emission estimates for EPS at the request of the District. EPA chose to use the 2009 revised emission estimates in its analysis, and thus the emissions estimates used in this analysis are different from those used in the Applicant's 2007 AFC.

II. Analysis

The EPS is an existing major source, as defined in 40 CFR 52.21(b)(1), since the facility is one of the 28 source categories, and emits or has the potential to emit (PTE) pollutants regulated under the PSD program at levels greater than or equal to 100 tons per year (tpy). Therefore, any modification (i.e., physical change or change in the method of operation) at the facility must be evaluated to determine whether the net emission increase of any PSD pollutant[3] will result in a major modification that is subject to PSD major modification permit requirements.

The PSD regulations at 40 CFR 52.21(a)(2)(iv) and 40 CFR 52.21(b)(3) contain the calculation methodologies for determining whether a physical change or change in the method of operation at an existing major source is subject to PSD review. A project is a major modification if it results in both a "significant emissions increase" and "a significant net emissions increase" of any PSD pollutant.

[2] See page 3 of the June 5, 2009 letter from George L. Piantka (NRG Energy) to Gerardo Rios (EPA Region 9) regarding "Subject: PSD Non-Applicability Determination Request for the Carlsbad Energy Center Power Project".
[3] "PSD pollutant" refers to "regulated NSR pollutant" as defined in 40 CFR 52.21(b)(50).

II.1 *Significant Emissions Increase (Step 1)*

The first step in determining whether a project results in a major modification is to determine whether the project will result in a significant emissions increase. (See 40 CFR 52.21(a)(2)(iv)(b).) The procedure for calculating (before beginning actual construction) whether a significant emissions increase will occur depends on whether the units being modified are new or existing emissions units.

The CECP involves installation of new CTGs and the removal of three existing boilers. Step 1 only considers emission increases from these units, and emission increases will occur only as a result of the new CTGs. For the new emissions units, a significant emissions increase of a PSD pollutant is determined by the difference between the potential-to-emit (PTE)[4] for each new emissions unit and the "baseline actual emissions"[5] for these units. Since these are new units, the baseline actual emissions for the units are zero.[6]

The emission increases expected from the new units are shown below in Table 1. The table shows that the proposed project results in a significant emission increase for NOx, CO, and particulates since the emissions of these pollutants exceed the applicable PSD significant levels. (See 40 CFR 52.21(b)(23).)

Table 1 - Emission Increases from New Units (Construction of CECP)

	NOx (tpy)	**CO (tpy)**	**VOC (tpy)**	**PM_{10}[7] (tpy)**	**SOx (tpy)**
PTE	72.8	339.9	23.7	39	5.6
Baseline Actual Emissions	0	0	0	0	0
Emission Increase	72.8	339.9	23.7	39	5.6
PSD Significant Level (40 CFR 52.21(b)(23))	40	100	40	15	40
Significant Emission Increase?	**Yes**	**Yes**	**No**	**Yes**	**No**

II.2 *Significant Net Emissions Increase (Step 2)*

The second step in determining whether a project results in a major modification is to determine whether the project will also result in a significant net emissions increase. (See 40 CFR 52.21(a)(2)(iv)(b).) The procedure for calculating whether a net emission increase will occur is in 40 CFR 52.21(b)(3). Generally, a net emissions increase occurs for a PSD pollutant when the sum of the emissions increases from a modification (Step 1), and any contemporaneous increases and decreases in actual emissions at the stationary source exceed zero. For PSD, a *significant* net emissions increase occurs when the net emissions increase exceeds the PSD significant levels.

[4] PTE is defined in 40 CFR 52.21(b)(4) and refers to the maximum capacity that a stationary source can emit a pollutant under its physical and operational design, or a practically enforceable emission limitation.

[5] The term "baseline actual emissions" is defined in 40 CFR 52.21(b)(48).

[6] See 40 CFR 52.21(b)(48)(iii).

[7] According to pages 6-7 of the FDOC issued by the District for the proposed CECP, all particulate matter (PM) is emitted as particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Thus, emissions of PM, PM_{10} and $PM_{2.5}$ are equivalent for the proposed CECP. The PSD significant level for $PM_{2.5}$ is 10 tpy. Therefore, the project is also significant for $PM_{2.5}$.

An increase or decrease in actual emissions is contemporaneous only if it occurs between the date five (5) years before construction of the modification and the date that the increase from the particular change occurs.[8] The new CTG units will replace existing Units 1, 2, and 3. The removal of these emission units will result in contemporaneous decreases. Permit conditions 81 and 84 require the emission units to be shut down by the end of the shakedown period for the CTGs, making the contemporaneous decreases enforceable. According to the District, no construction permits (ATCs) were issued to the EPS since 2002. Therefore, there are no other contemporaneous increases or decreases other than the contemporaneous decreases resulting from the shutdown of Units 1, 2, and 3.

Contemporaneous increases and decreases are calculated using the procedure in 40 CFR 52.21(b)(48), except that 40 CFR 52.21 (b)(48)(i)(c) and (b)(48)(ii)(d) do not apply, for determining baseline actual emissions. Baseline actual emissions for an EUSGU, such as the EPS, is the average annual rate of actual emissions during any consecutive 24-month period within the 5-year period immediately preceding project construction. In its June 2009 analysis submitted to EPA, the Applicant stated that it expects to begin construction of the project in 2010, pending issuance of the CEC license.[9] If the Applicant begins construction in 2010, the 5-year lookback period would be 2006 to 2010.

However, the Applicant believed that the period from 2006 onwards (i.e., until 2010) is not representative of normal source operation and has requested to use a different period for determining baseline actual emissions for the existing boilers that will be removed.[10] EPA allows the use of a different consecutive 24-month period if such period is determined to be more representative of normal source operation.[11]

As with most power plants, normal operation for EPS's Units 1, 2, and 3 is directly responding to demand for electricity. Operation is dependent on several factors. For instance, operations at EPS are influenced by the California Independent System Operator (ISO), which is responsible for dispatching power plant units to meet electric demand within an applicable service area, such as San Diego County. ISO dispatches power from newer, more efficient power plants prior to dispatching power from older units, such as the units at EPS. Therefore, older power plants will be dispatched even less often when new power plants come online in the service area. Electricity consumption and demand also affects operation.

There are a number of factors that can be used as indicators of normal operation at a power plant, including fuel usage. EPA examined annual historical fuel usage (i.e., natural gas consumption) for Units 1, 2 and 3 for the period of 1997 to 2009 provided by the Applicant.[12] (See Attachments A and B.) Based on this data, EPA determined that fuel usage for each unit has followed a cyclic nature resulting in several highs and lows between 1997 and 2006. This

[8] If the Applicant submitted an additional application prior to the start of construction for this project, then that application would have to consider the increases and decreases from this project.
[9] As of the date of this letter, the CEC has not approved license for this project.
[10] See page 3 of the June 5, 2009 letter from George L. Piantka (NRG Energy) to Gerardo Rios (EPA Region 9) regarding "Subject: PSD Non-Applicability Determination Request for the Carlsbad Energy Center Power Project".
[11] See 40 CFR 52.21(b)(48)(i).
[12] Data for 2010 was not yet available.

cyclic nature continued to occur even with the installation and operation of newer power plants in the San Diego County area. For example, the Wildflower, Escondido, and Border power plants came online in 2001, and the Palomar Power Plant came online in 2006, and the data suggests that the operation of these new power plants may have caused the EPS units to be dispatched less frequently by ISO. Thus, the years following 2001 and 2006 saw a drop in fuel usage.

However, fuel usage and, hence, the operation of the boilers plunged significantly in the years following 2006, dropping to its lowest levels in the 12 years of data examined. Fuel usage did not follow the same cyclic nature of highs and lows compared to previous years. The fuel usage data also indicates that the plant may have been dispatched even less in 2010 than previous years because the Otay Mesa Power Plant went online in 2009.[13] Therefore, EPA believes the period after 2006 is not representative of normal source operation for Units 1, 2 and 3 since normal operation would not occur at such significantly reduced capacity for such an extended period of time.

EPA examined monthly historical fuel data for Units 1, 2, and 3 to determine the most recent 24-month period prior to December 2006 that was more representative of normal source operation. (See Attachments C and D.) EPA determined that the 24-month period between May 2003 and April 2005 is the most recent period that is most representative of normal operation since this is the period before fuel use begins to decrease significantly at the EPS and where there were less periods when there was no fuel usage.[14] Thus, the emissions of NOx, CO, and particulates were calculated based on this period.

Table 2 summarizes the emission increases and contemporaneous emission increases and decreases for the proposed project. Based on this information, EPA has determined that the project will not result in a significant net emissions increase. As shown in Table 2, the proposed CECP will not result in a significant net emission increase.

Table 2 - Net Emission Increases

	NOx (tpy)	**CO (tpy)**	**PM10[15] (tpy)**
Significant Emission Increases from CECP	72.8	339.9	39.0
Contemporaneous Increases at EPS	0	0	0
Contemporaneous Decreases at EPS	-41.6	-289.0	-41.7
Net Emission Increase	39.2	50.9	-2.7
Significant Level (40 CFR 52.21(b)(23))	40	100	15
Significant Net Emission Increase?	**No**	**No**	**No**

[13] The Otay Mesa Power Plant came online in October 2009. See http://www.energy.ca.gov/sitingcases/all_projects.html.

[14] See monthly emissions data for Units 1, 2, and 3 provided in a June 11, 2010 e-mail from Tom Andrews (Sierra Research) to Shaheerah Kelly (EPA).

[15] According to Table 5a of the FDOC issued by the District, emissions of PM2.5, PM10, and PM from the Encina Power Station are very close and do not vary significantly (i.e., less than 1 tpy difference). Thus, the net emission increase for PM2.5, PM10, and PM are less than the PSD significant levels of 10 tpy, 15 tpy, and 25 tpy, respectively. Therefore, PSD permit requirements do not apply for these pollutants.

III. Conclusion

As explained above, the CECP will result in a significant emissions increase for NOx, CO, and particulates. However, the project will not cause or result in a significant net emissions increase for any pollutant. Therefore, the CECP will not result in a major modification and is not subject to PSD permit requirements.

ATTACHMENT A

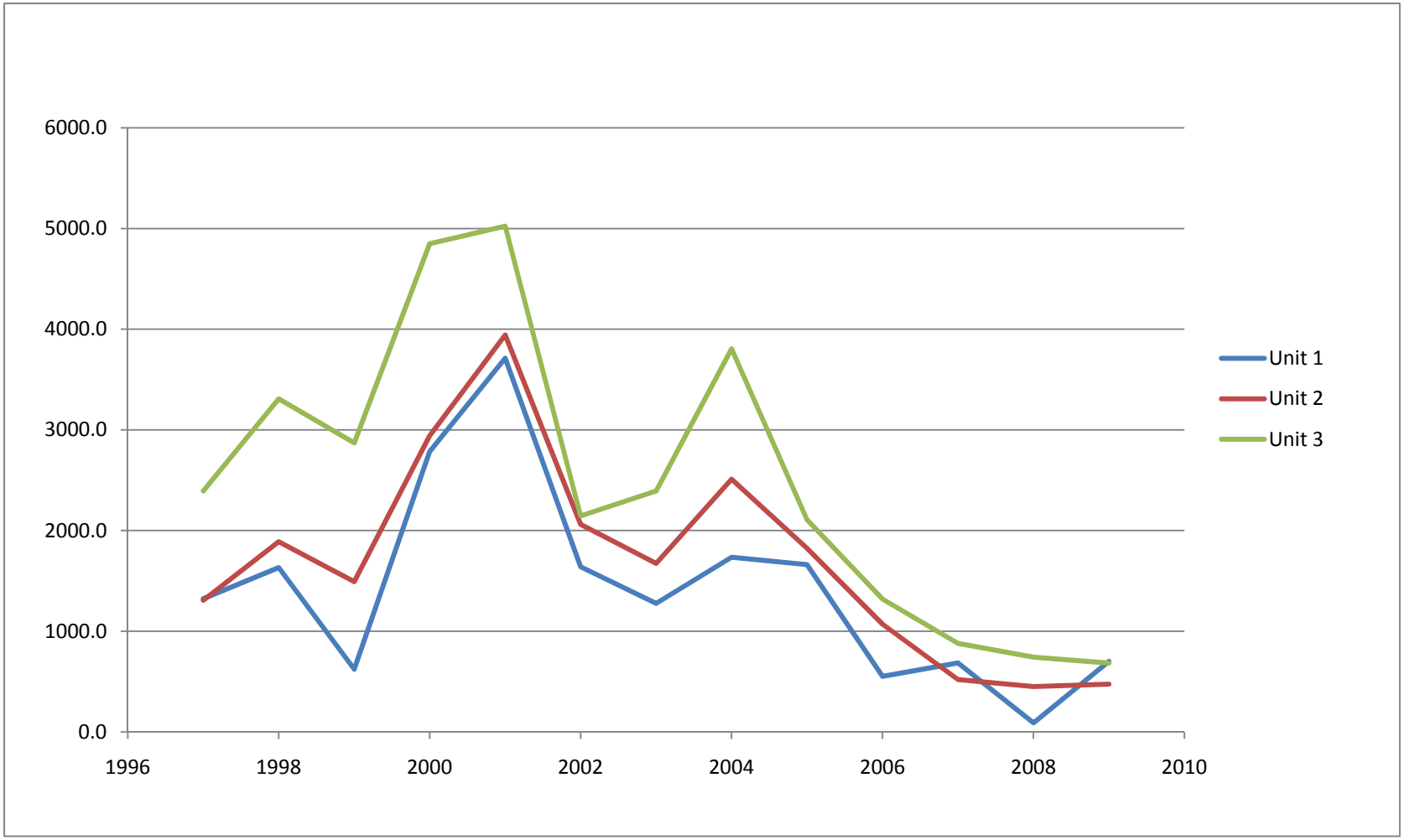
Annual Fuel Usage for the Encina Power Station Units 1-3

Natural Gas (MMscf/year)													
Emission Unit	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Unit 1	1,323.4	1,632.2	622.7	2,784.9	3,712.2	1,640.0	1,275.9	1,734.3	1,661.7	551.8	685.0	89.0	701.0
Unit 2	1,306.5	1,890.0	1,492.3	2,941.6	3,941.9	2,060.8	1,673.0	2,510.7	1,823.7	1,070.4	520.0	450.0	474.0
Unit 3	2,392.9	3,307.8	2,870.2	4,848.3	5,023.5	2,145.8	2,393.4	3,805.0	2,107.8	1,319.2	879.0	742.0	684.0
Total	25,823.0	31,528.0	31,758.4	35,627.9	41,945.9	26,239.6	26,713.4	34,354.0	21,136.2	15,131.4	8,677.0	12,095.0	1859.0

(Source: Emails dated March 12, 2010 and June 11, 2010 regarding “Encina Power Plant Fuel Use” from Tom W. Andrews (Sierra Research) to Shaheerah Kelly (U.S. EPA, Region 9))

ATTACHMENT B

Annual Fuel Usage (MMscf)
between 1997 and 2009 for Units 1-3



ATTACHMENT C

Monthly Fuel Usage (MMscf) between 2002 and 2009 for Units 1-3

Month	Unit 1							
	2002	2003	2004	2005	2006	2007	2008	2009
January	185.94	105.32	76.47	54.43	145.81	4.56	0.00	0.00
February	302.35	38.71	301.27	143.67	35.54	5.79	0.00	0.00
March	203.88	0.00	173.11	263.84	20.07	0.00	0.00	0.00
April	37.21	97.31	50.24	391.17	92.57	17.41	12.61	53.61
May	0.00	302.10	122.71	52.40	0.00	36.39	0.00	58.91
June	76.37	307.26	109.22	113.60	39.60	0.00	0.00	5.46
July	277.43	91.36	95.71	96.82	173.60	20.01	12.50	148.70
August	128.24	30.78	91.58	164.18	8.03	61.80	0.00	155.76
September	125.73	0.00	258.70	99.81	36.53	49.21	0.00	200.79
October	86.80	61.68	168.62	26.96	0.00	149.65	41.50	77.70
November	42.92	10.03	276.41	228.13	0.00	187.90	0.00	0.00
December	173.13	231.39	10.20	26.68	0.00	152.32	22.00	0.00
Total	1640.00	1275.94	1734.26	1661.66	551.76	685.00	89.00	701.00

(Source: Email dated June 11, 2010 regarding "Encina Monthly Emissions" from Tom W. Andrews (Sierra Research) to Shaheerah Kelly (U.S. EPA, Region 9))

Month	Unit 2							
	2002	2003	2004	2005	2006	2007	2008	2009
January	137.00	19.78	116.03	0.00	0.00	15.33	0.00	0.00
February	293.80	0.00	371.82	153.90	249.85	0.01	0.00	0.00
March	110.21	74.82	513.67	340.87	285.07	0.00	0.00	0.00
April	38.04	326.89	187.71	479.03	161.38	15.16	0.40	108.31
May	84.65	304.03	167.81	25.55	0.00	28.27	0.00	52.55
June	79.43	54.28	69.54	168.91	86.76	0.00	0.00	5.31
July	314.62	101.69	171.57	194.71	217.95	16.40	14.69	51.37
August	279.09	274.92	123.00	102.90	14.35	81.63	0.00	95.00
September	253.44	90.04	182.12	36.69	13.91	36.99	73.55	132.96
October	95.35	186.91	271.72	46.52	34.72	168.35	79.49	28.74
November	92.77	30.54	258.85	263.24	0.00	143.97	100.55	0.00
December	282.40	209.11	76.84	11.41	6.39	13.94	181.69	0.00
Total	2060.80	1673.01	2510.69	1823.74	1070.37	520.00	450.00	474.00

(Source: Email dated June 11, 2010 regarding "Encina Monthly Emissions" from Tom W. Andrews (Sierra Research) to Shaheerah Kelly (U.S. EPA, Region 9))

Month	Unit 3							
	2002	2003	2004	2005	2006	2007	2008	2009
January	19.83	298.91	228.87	197.18	0.00	0.00	205.79	0.00
February	333.29	249.42	422.32	234.71	240.60	13.36	0.29	11.54
March	208.12	11.52	426.09	308.40	365.75	0.03	0.00	59.39
April	70.75	52.05	134.64	259.73	218.69	17.00	20.50	176.22
May	24.90	247.15	272.34	0.00	0.00	27.36	61.48	89.47
June	186.33	31.92	79.09	171.61	90.29	0.00	0.00	4.43
July	428.34	197.31	254.07	174.92	239.74	36.93	11.90	83.31
August	377.73	312.14	189.52	104.83	78.68	124.19	14.65	57.51
September	367.98	404.11	412.54	86.52	7.70	97.96	48.78	140.01
October	107.77	125.29	492.95	180.65	71.50	187.06	92.33	62.50
November	0.00	180.00	482.33	300.26	0.00	187.79	51.52	0.00
December	20.76	283.62	410.28	88.95	6.28	187.19	234.56	0.00
Total	2145.81	2393.43	3805.04	2107.76	1319.23	879.00	742.00	684.00

(Source: Email dated June 11, 2010 regarding "Encina Monthly Emissions" from Tom W. Andrews (Sierra Research) to Shaheerah Kelly (U.S. EPA, Region 9))

ATTACHMENT D

Monthly Fuel Usage (MMscf) between 2002 and 2009 for Units 1-3