Locke Lord LLP
Attorneys & Counselors

500 Capitol Mall, Suite 1800
Sacramento, CA 95814
Telephone: 916-930-2500
Fax: 916-930-2501
www.lockelord.com

John A. McKinsey
Direct Telephone: 916-930-2527
Direct Fax: 916-720-0443
jmckinsey@lockelord.com

May 28, 2013

Via E-Mail and Hand Delivery

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

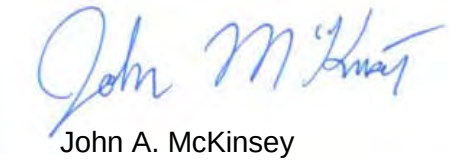
Re: El Segundo Power Plant Project (00-AFC-14C)
Applicant's Letters dated May 17, 2013 and May 22, 2013
to South Coast Air Quality Management District

Dear Sir/Madam:

On behalf of El Segundo Power Plant Project, enclosed please find for docketing (1) Applicant's letter dated May 17, 2013 to South Coast Air Quality Management District and (2) Applicant's letter dated May 22, 2013 to South Coast Air Quality Management District.

Please don't hesitate to contact me if you have any questions regarding these filings.

Very truly yours,



John A. McKinsey

JAM:dh
Enclosures

sierra research

1801 J Street
Sacramento CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor MI
Tel: (734) 761-6666
Fax: (734) 761-6755

May 17, 2013

Kenneth L. Coats
AQ Engineer II
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

Subject: El Segundo Power Facility Modification Project
Facility ID #115663

Dear Mr. Coats:

Provided below are responses to several of the requests for additional clarifying information contained in the SCAQMD's April 12, 2013 letter to El Segundo Power LLC regarding the March 2013 permit application for the proposed El Segundo Power Facility Modification Project. As discussed below, we are in the process of collecting the remaining information requested by the District and will provide this information as soon as it is available.

Data Request Number 1: GE 7FA Unit $PM_{10}/PM_{2.5}$ emissions gas turbine manufacturer performance warranty.

Response: While at this point in the procurement process it will not be possible to obtain a manufacturer emissions performance warranty for the GE 7FA unit, El Segundo Power, LLC is in the process of obtaining a letter from GE regarding the expected emission $PM_{10}/PM_{2.5}$ emissions levels for this unit and will submit a copy to the SCAQMD as soon as it is available.

Data Request Number 2: $PM_{2.5}$ emission factors for Units 3 and 4, Units 5 and 7, new auxiliary boiler, new GE 7FA unit, new Trent 60 units.

Response: Summarized below are the $PM_{2.5}$ emission factors developed for the proposed new units as well as the existing units at the facility.

- Proposed new auxiliary boiler: The $PM_{2.5}$ emission factor for this unit is expected to be identical to the PM_{10} emission factor shown in the permit application. The PM_{10} emission factor for this unit is included in Table B-3 of the March 2013 permit application.

- Proposed new GE 7FA unit: The $PM_{2.5}$ emission factors are expected to be identical to the PM_{10} emission factors shown in the permit application. The various PM_{10} emission factors for this unit are included in Table B-8 of the March 2013 permit application.

- Proposed new Trent 60 units: The $PM_{2.5}$ emission factors are expected to be identical to the PM_{10} emission factors shown in the permit application. The various PM_{10} emission factors for these units are included in Table B-14 of the March 2013 permit application.

- Existing Units 3 and 4: The $PM_{2.5}$ emission factor for these units is shown in the enclosed July 30, 2008 letter from El Segundo Power, LLC to the SCAQMD (see Attachment 1).

- Existing Units 5 and 7: The $PM_{2.5}$ emission factors for these units are expected to be identical to the PM_{10} emission factors shown on the enclosed pages. The PM_{10} emission factor for these units is shown in the enclosed pages from May 14, 2010 SCAQMD engineering evaluation for the ESPR Project (see Attachment 2).

Data Request Number 3: Duct burner make/model number and number of these burners.

Response: El Segundo Power LLC is in the process of obtaining this information from the duct burner vendor. We will submit this information to the SCAQMD as soon as it is available.

Data Request Number 4: Trent 60 Unit $PM_{10}/PM_{2.5}$ emissions turbine manufacturer performance warranty.

Response: As discussed above regarding this same issue for the GE 7FA unit, at this point in the procurement process it will not be possible to obtain a manufacturer emissions performance warranty for the Trent units. However, El Segundo Power, LLC was able to obtain a letter from Rolls-Royce regarding the expected $PM_{10}/PM_{2.5}$ emission levels for the Trent units (see Attachment 3).

Data Request Number 5: Auxiliary boiler low-NOx burner make/model number and manufacturer performance warranty.

Response: As with gas turbines, this early in the procurement process it will be impossible to obtain a manufacturer emissions performance warranty for the auxiliary boiler. However, El Segundo Power, LLC is in the process of obtaining a letter from the auxiliary boiler vendor regarding the expected NOx emission levels for the auxiliary boiler along with the expected burner make/model number. We will submit this information to the SCAQMD as soon as it is available.

Data Request Number 6: SCR and CO catalyst manufacturer performance warranties and catalyst dimensions.

Response: As discussed above, this early in the procurement process it will be impossible to obtain a manufacturer emissions performance warranties for the SCR/oxidation catalysts. El Segundo Power, LLC was able to obtain a letter from the SCR/oxidation catalyst vendor for the Trent units providing the expected emission levels for these units (see Attachment 4). We are in the process of obtaining a similar letter from the SCR/oxidation catalyst vendor for the GE 7FA unit and will submit this to the SCAQMD as soon as it is available.

With regards to dimensions of the SCR and oxidation catalysts, these dimensions are shown on the SCAQMD Forms 400-E-5 that were included in the March 2013 permit application for the proposed project.

Data Request Number 7: Additional information regarding GE 7FA Unit fast startup technology.

Response: El Segundo Power, LLC is in the process of obtaining this information from GE and will submit it to the SCAQMD as soon as it is available.

Data Request Number 8: GE 7FA Unit additional information on hot, warm, cold startups.

Response: There are two types of GE 7FA unit startups discussed/analyzed in the March 2013 permit application—"traditional" and "fast." The distinction between "traditional" and "fast" startups is described on page 12 of the March 2013 permit application. In addition, the detailed emission calculations for the two types of startups are included in Appendix F of the March 2013 permit application.

The duration, fuel use, and power output during the two types of startups and during a shutdown are summarized in the following table (based on a worst-case ambient condition of 59°F). The startup duration shown in the following table is the time required following ignition for the emission control system to control emissions to normal operating levels.

Data Request Number 8 GE 7FA Unit – Startups/Shutdowns			
Operating Mode	Time per Event (minutes)	Fuel Use per Event (MMBtu, HHV)	Power Produced per Event (MW-hrs)
Fast Startup	12 minutes to full turbine power	121	8.1
Traditional Startup	20 minutes to full turbine power	287	22
Shutdown	30 minutes to full stop	269	22

There is no meaningful distinction between cold, warm, or hot startups with regard to GE 7FA turbine emissions, due to the decoupling of startup activities for the gas turbine and steam-side components. In order to ensure compliance under all types of operation, maximum emissions have been assumed for each type of startup.

Data Request Number 9: Heath Risk Assessment

Response: The air quality impact analysis submitted to the SCAQMD on March 12, 2013 included the requested health risk assessment at page 15.

Data Request Number 10: Analysis demonstrating that the Trent 60 units meet the requirements for the Rule 1304.a emission offset exemption.

Response: As discussed in the March 2013 permit application (see page 27), the proposed Trent units meet the Rule 1304(a)(2) requirement for the use of "advanced" turbines because the units are equipped with inlet spray intercooling systems to reduce ambient inlet temperatures and decrease the energy required for compression. This results in a heat rate of 8,990 Btu/MWhr (HHV) that is lower than other advanced designs (e.g., 9,461 Btu/MWhr (HHV) for the LM6000 PC SprINT). This advanced design concept of the Trent units is also discussed in the enclosed letter from Rolls-Royce (see Attachment 3). The letter from Rolls-Royce points out the advanced design features of the units, including a three shaft design, high pressure ratios, and use of aerospace components to maximize thermal efficiency. In addition, the Rolls-Royce letter explains that the inlet spray intercooling system acts as a progressive intercooler throughout the early stages of the compression system where the evaporation of water provides for cycle benefits. Thus, the Trent unit's inlet spray intercooling system is a form of intercooling. For all of the above reasons El Segundo Power, LLC firmly believes the Trent units qualify for the Rule 1304(a)(2) exemption due to being advanced design turbines with intercooling and other advanced design features.

Data Request Number 11: PSD Impact Analyses

Response: As discussed in the SCAQMD April 12, 2013 letter, there are several analyses that could potentially be required by the PSD regulations. These include Federal Class I and II impact analyses, and impacts to visibility, soil, and vegetation. As discussed in the air quality impact analysis submitted to the SCAQMD on May 12, 2013, the project development team is in the process of preparing these analyses. Part of the delay in preparing these analyses was establishing which nearby emission sources should be included in the various ambient impact analyses. While this issue has been recently resolved with regard to the increment analysis, the list of nearby sources for the cumulative NO_2 impact analysis has not yet been finalized. We will continue to prepare these analyses and will submit to the SCAQMD as soon as they are available.

Data Request Number 12.a: GHG BACT Analysis – Review of alternative equipment such as smaller combined cycle gas turbines in place of the proposed Trent 60 simple cycle units.

Response: El Segundo Power, LLC has proposed a combination of the state of the art GE 7FA combined cycle generation (a 1x1 train) integrated with two Trent 60 advanced simple cycle gas peaking units. The site has two existing Siemens Flex Plant-10 1x1 combined cycle units. The combination enables flexibility to dispatch what is needed and when.

The District's PSD requirements for GHGs incorporate, by reference, EPA requirements. EPA recognizes that the authority to use BACT to redefine the source by requiring use of alternate basic equipment is limited:

> "The permit issuer ... should take a hard look at the applicant's determination in order to *discern which design elements are inherent for the applicant's purpose* and which design elements may be changed to achieve pollutant emissions reductions without *disrupting the applicant's basic business purpose for the proposed facility, while keeping in mind that BACT, in most cases, should not be applied to regulate the applicant's purpose or objective for the proposed facility.* (EPA Region 9's Response to Petitions for Review, *In re: Pio Pico Energy Center, PSD Permit No. SD 11-01*, emphasis in original)

The Trent 60s cannot be replaced by smaller combined-cycle turbines without compromising the project's purpose. The CC Fast combined cycle unit is capable of fast starts – comparable to peaking units – and has the overall thermal efficiency and low emissions of combined cycle units. The site infrastructure and space constraints will not support the addition of two additional CC Fast units. The advanced Trent 60 generating units are capable of fast starts and provide dispatch flexibility. When combined, this configuration would significantly reduce startup emissions and enable greater capacity and faster delivery of electricity to the southern California grid. A project comprised only of combined cycle units would either exceed the capacity of the existing site infrastructure, or would not achieve these objectives.

Data Request 12.d: GHG BACT Analysis – Demonstrate that the total GHGs from the GE F7A Combined Cycle Gas Turbines will comply with the CO2e Emission Performance Standard (EPS for combined heat and power facilities of 1,100 lbs CO2e/net MWh).

Response: The greenhouse gas emissions from the project are provided in Table D-3 of the March 2013 permit application. The GHG emission rate from the GE turbine will be 0.387 metric tons per MWHr (853 lb/MWHr), which is below the EPS standard listed in the SCAQMD letter. It should be noted that this ESP standard in the California Code of Regulations (Title 20, California Code of Regulations, section 2900 et seq.) does not apply to the proposed new GE 7FA unit because this is not a baseload unit. In addition, while this standard is also included in the proposed Federal Greenhouse Gas New Source Performance Standard for Electric Generating Units, this regulation is still in the development phase and has not yet been finalized.

Data Request 12.c: GHG BACT Analysis – compare Trent 60 units to other simple cycle units with regards to thermal efficiency.

Response: The following table compares the heat rate for the proposed Trent 60 DLE ISI units with those for the LM6000 PC SprINT and the LMS100. The value for the latter units are nominal heat rates at ISO conditions.

The table shows that the Trent 60 is more efficient than the LM6000. The LMS100 is the most efficient turbine in the list, but with only a nominal difference as compared to the Trent 60. However, the site cannot accommodate two LMS100 units, and a single

LMS100 unit would not take full advantage of the site's available infrastructure, resulting in a net reduction in available site capacity. In addition, the two Trent 60 DLE ISI units would be able to operate, in tandem at a range of 28.7 MW (50% load on one unit) to 114.8 MW (100% load for both units), while a single LMS100 unit would provide a working range of 51.5 MW to 103 MW – providing far less dispatch flexibility at this site.

Turbine	Nominal Capacity (ISO conditions)	Heat Rate,[1] Btu_{HHV}/kWh_{Gross}
Trent 60 DLE ISI	57.4 MW	8,990[2]
LM6000 PC SprINT	50 MW	9,461[3]
LMS100	103 MW	8,667[4]

NOTES:
[1]HHV/LHV = 1.109
[2]3/7/2013 permit application, Appendix B, Table B-2, Mild Base (cooler) case: 516 MMBtu/hr, 57.4 MW = 8990 Btu/kwh. This case is the closest to ISO conditions.
[3]LM6000 SprINT GE Website, 8,531 Btu_{LHV}/kWh at ISO conditions = 9,461 Btu_{HHV}/kWh
[4]LMS100 PA GE Website, 7,815 Btu_{LHV}/kWh at ISO conditions = 8,667 Btu_{HHV}/kWh

Data Request 12.d: GHG BACT Analysis – compare selected auxiliary boiler to other auxiliary boiler designs with regards to thermal efficiency.

Response: EPA's GHG BACT guidance for gas-fired boilers identifies the following boiler characteristics as relevant to a GHG BACT determination:

- Boiler Annual Tune-up – Once a year the boiler is tuned for optimal thermal efficiency.
- Boiler Oxygen Trim Control – Stack oxygen level is monitored and the inlet air flow is adjusted for optimal thermal efficiency.
- Use of an Economizer – A heat exchanger is used to transfer some of the heat from the boiler exhaust gas to the incoming boiler feedwater. Preheating the feedwater in this way reduces boiler heating load, increases its thermal efficiency and reduces emissions.
- Boiler Blowdown Heat Recovery – Periodically or continuously, some water in the boiler is removed as a means of avoiding the build-up of water impurities in the boiler. A heat exchanger is used to transfer some of the heat in the hot blowdown water for preheating feedwater. This increases the boiler's thermal efficiency.
- Condensate Recovery – As the boiler steam is used in the heat exchanger, it condenses. When hot condensate is returned to the boiler as feedwater, the boiler heating load is reduced and the thermal efficiency increases.[1]

These characteristics are used in lieu of quantitative efficiency comparisons because the latter are largely driven by site-specific requirements. With respect to the above criteria, the proposed Cleaver Brooks NB-100-D boiler is assessed as follows:

[1] USEPA. "PSD and Title V Permitting Guidance for Greenhouse Gases", November 2010. Appendix F.

- Boiler annual tune-up: the applicant will perform an annual tune-up on the auxiliary boiler to assure optimal efficiency.
- Boiler oxygen trim control: the boiler will be equipped with an oxygen trim control system.
- Economizer: the boiler will be equipped with an economizer.
- Boiler blowdown heat recovery: the boiler will not be equipped with boiler blowdown heat recovery.
- Condensate recovery: the boiler will not be equipped with condensate recovery.

EPA recently established BACT for the auxiliary boiler at Palmdale, based on these types of design characteristics, rather than a quantitative GHG emission rate or efficiency level:

> "BACT for this source is the purchase of thermally efficient units, conducting annual boiler tune-ups on each unit, limiting the auxiliary boiler to a heat input of 110 MMBtu/hr and 500 hours of operation per year based on a 12-month rolling total, and limiting the HTF heater to 40 MMBtu/hr and 1,000 hours of operation per year based on 12-month rolling total. Currently, there are no other facilities with GHG BACT limits for limited use natural gas-fired boilers and process heaters."[2]

We believe the same approach should be used for the auxiliary boiler for the ESPFM project.

Data Request Number 13: Prepare a detailed retirement plan for El Segundo Units 3 and 4.

Response: The preparation of a detailed retirement plan for El Segundo Units 3 and 4 goes beyond the information needed by the SCAQMD to deem a permit application complete. The requirements for a compliance permit application are identified in the SCAQMD Regulation II (see SCAQMD Regulation II - List and Criteria Identifying Information Required of Applicants Seeking a Permit To Construct from the South Coast Air Quality Management District, Amended April 10, 1998). As an alternative to a detailed retirement plan, El Segundo Power, LLC is in the process of developing a schedule of the various steps that will be necessary for the retirement of El Segundo Units 3 and 4, and we will submit this schedule to the SCAQMD as soon as it is finished It should be noted as a reminder that Unit 3 and 4 will be demolished to enable construction of the El Segundo Power Facility Modification Project. Unit 3 will retire in July 2013 in accordance with the existing Permit to Construct for El Segundo Power, LLC Units 5-8; retirement of Unit 3 will entail termination of fuel supply to the boiler and therefore steam generation to the turbine. Unit 3 also could not operate when Units 5-8 are commercial as there is limited generation off-take capability from the site that can only accommodate the operation of Units 4-8 at their respective loads. Unit 4 will retire to enable construction of this proposed project, or by December 31, 2015 in accordance with the State Water Resources Control Board's Once Through Cooling policy, whichever is sooner.

---

[2] EPA, *Fact Sheet and Ambient Air Quality Impact Report, Palmdale Hybrid Power Project* (August 2011), p. 34.

If you have any questions regarding these data responses, please do not hesitate to contact George Piantka at 760-710-2156 or me at 916-444-6666.

Sincerely,

Tom Andrews
Senior Engineer

Attachments

cc: Craig Hoffman, CEC Project Manager
George Piantka, NRG
Ken Riesz, NRG
Steve Odabashian, NRG

ATTACHMENT 1

JULY 30, 2008 LETTER FROM NRG TO THE SCAQMD
$PM_{2.5}$ EMISSIONS EL SEGUNDO UNITS 3 AND 4

301 Vista Del Mar Blvd
El Segundo, CA 90245

Direct: (310) 615-6342
Fax: (310) 615-6060

El Segundo Power II LLC

July 30, 2008

Mr. Kenneth L. Coats
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4182

Subject: El Segundo Power Redevelopment Project (Facility ID No. 115663)

Dear Mr. Coats,

The purpose of this letter is to describe the approach that will be used by the El Segundo Power Redevelopment Project (ESPR) to comply with the recently implemented permitting program for the $PM_{2.5}$ National Ambient Air Quality Standards. In a May 16, 2008 Federal Register notice, USEPA issued rules on how states should implement the New Source Review (NSR) permitting program for the $PM_{2.5}$ National Ambient Air Quality Standards. While EPA allows states three years to amend their permit programs covering $PM_{2.5}$ nonattainment areas as of July 15, 2008, the EPA requires new major sources or major modifications of $PM_{2.5}$ located in $PM_{2.5}$ nonattainment areas to undergo NSR permitting via 40 CFR 51, Appendix S.

To address this additional NSR permitting requirement, the ESPR proposes to accept new permit conditions limiting the facility-wide $PM_{2.5}$ potential to emit for the ESPR below the major source threshold of 100 tons/year. We request the following new permit conditions be added to the permit the District is currently working on for the ESPR:

Condition 1: The operator shall limit the combined $PM_{2.5}$ emissions from Devices D11, D13, D67, and D68 to 98 tons/year. The operator shall calculate the annual emissions of $PM_{2.5}$ using the equation below.

Annual $PM_{2.5}$ emissions, tons/year = $(X_{D11} \times EF_{D11}) + (X_{D13} \times EF_{D13}) + (X_{D67} \times EF_{D67}) + (X_{D68} \times EF_{D68})$

Where X = annual fuel usage (mmscf/year) for each unit

Where EF = $PM_{2.5}$ emission factor (lbs/mmscf) for each unit

The operator shall use a $PM_{2.5}$ emission factor of 5.16 lbs/mmscf for Devices D11 and D13 and an emission factor of 4.66 lbs/mmscf for Devices D67 and D68. The operator may use alternative $PM_{2.5}$ emission factors, based on source test results provided that these factors are approved by the AQMD.

[Devices subject to this condition: D11, D13, D67, D68]

Condition 2: The operator shall conduct source test(s) for the pollutant(s) identified below to verify the $PM_{2.5}$ emission factors.

Pollutant	*Required Test Method*	*Averaging Time*	*Test Location*
$PM_{2.5}$	*AQMD Approved*	*AQMD Approved*	*Outlet of SCR serving this equipment*

The test(s) shall be conducted once every three years for $PM_{2.5}$.

The test shall be conducted in accordance with an AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the equipment during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test(s) shall be conducted when this equipment is operating at 100 percent load.

[Devices subject to this condition: D11, D13, D67, D68]

The proposed emission factor for Units 3 and 4 (Devices D11 and D13) is based on a review of source test data collected in May 2001. During a four day period in May 2001, eight 1-hour particulate tests were performed on Unit 3 at four different loads with and without ammonia injection. The particulate emission factor of 7.22 lbs/mmscf recorded during Test Run Number 7 was the only result out of eight that was higher than 4.00 lbs/mmscf. Consequently, this test run appears to be an outlier and was not included in the $PM_{2.5}$ emission factor calculation for Units 3 and 4. The average of the remaining seven test runs is 2.88 lbs/mmscf and the standard deviation is 0.88 lbs/mmscf. The proposed $PM_{2.5}$ emission factor of 5.0 lbs/mmscf for Units 3 and 4 is rounded up from the average of the test results plus two standard deviations. The detailed emission factor calculations for Units 3 and 4 are included in Attachment 1. The proposed $PM_{2.5}$ emission factor for Units D67 and D68 (Units 5 and 7) is the same as the PM_{10} emission factor contained in draft permit condition A63.2.

If you have any questions or need further information, please don't hesitate to contact me at (310) 615-6342.

Sincerely,

Roy E. Craft
Regional Plants Manager
El Segundo Power II LLC

Enclosure

cc: Mohsen Nazemi, SCAQMD
Michael Mills, SCAQMD
John Yee, SCAQMD
Stephen D. Munro, CEC
CEC Dockets 00-AFC-14C
Tim Hemig, NRG
Tom Andrews, Sierra Research

ATTACHMENT 1

PARTICULATE SOURCE TEST RESULTS
EL SEGUNDO GENERATING STATION UNIT 3

Summary of Particulate Test Results
El Segundo Generating Station - Unit 3

Test Number	Test Date	Natural Gas Flow Rate (kscfh)	PM Test Results (lbs/hr)	PM Emission Factor (lbs/mmscf)
1	5/23/2001	2345	8.5	3.62
2	5/23/2001	2344	9.2	3.92
3	5/24/2001	1633	4.6	2.82
4	5/24/2001	1630	4.7	2.88
5	5/25/2001	906	1.9	2.10
6	5/25/2001	911	1.3	1.43
8	5/29/2001	3103	10.5	3.38
			Average =	2.88
			S.D. =	0.88
			Average + 2 S.D. =	4.64

PERMIT TO CONSTRUCT COMPLIANCE TEST REPORT FOR NRG EL SEGUNDO UNIT 3 FACILITY ID 115663 DEVICE ID D11

PREPARED FOR:

NRG EL SEGUNDO OPERATIONS
301 VISTA DEL MAR BLVD
EL SEGUNDO, CALIFORNIA 90245

PREPARED BY:

Matthew R. McCune, P.E.
Vice President

REVIEWED BY:

Robert A. Finken
President

DELTA AIR QUALITY SERVICES, INCORPORATED
1845 NORTH CASE STREET
ORANGE, CALIFORNIA 92865-4234
(714) 279-6777

JUNE 2001
REPORT NUMBER: **R031741**

1.0 INTRODUCTION

Delta Air Quality Services, Inc. (Delta) was contracted by NRG El Segundo to perform the Permit to Operate compliance testing for Unit 3 following installation of a Selective Catalytic Reduction (SCR) system. Testing was performed to satisfy the requirements of condition 28-4 of the Permit to Operate. A test protocol (Delta document R031570) was submitted to the SCAQMD and conditionally accepted by SCAQMD on May 23, 2001

This report documents the results of the compliance testing performed from May 23 – 29, 2001. The Delta test team consisted of Matt McCune, John Peterson, Shannon Scrugham, and Ali Rasi. Steve Odabashian of NRG El Segundo coordinated the testing. The SCAQMD was notified of the test but was not present during the test.

2.0 SUMMARY OF RESULTS

The test results from the 335 MW, 250 MW, 170 MW, and 85 MW tests are summarized in Tables 2-1 through 2-4, respectively. The results show that the measured values for particulate matter (PM) and ammonia (NH_3) were below the permitted limits at all test conditions. Carbon monoxide (CO), oxides of sulfur (SO_x), and reactive organic gases (ROG's) were measured only during full load with ammonia injection. The CO emissions were below the permitted limit during this test. No emission limit is stated in the permit for oxides of nitrogen (NO_x), SO_x, or ROG's.

TABLE 2-1
NRG EL SEGUNDO UNIT 3
FULL LOAD TEST RESULTS

		Baseline (no ammonia)	With ammonia injection	Limit
Date		5/29/01	5/29/01	
Time		1030/1142	1241/1354	
O_2	%, dry	3.67	3.64	--
CO_2	%, dry	9.99	10.02	--
Stack Flow Rate	kacfm	949.8	967.8	--
	kdscfm	597.3	606.9	--
Stack Temperature	^oF	225.8	226.9	--
H_2O	%	16.8	16.9	--
NO_x	ppm	87.99	7.10	--
	ppm @ 3% O_2	91.4	7.36	--
	lb/hr	382.2	9.1	--
	lb/MMBtu	0.109	0.009	--
	lb/MMSCF	112.6	9.1	--
PM	gr/dscf	0.0044	0.0020	0.1
	lb/hr	22.5	10.5	--
NH_3	ppm	n/a	4.3	--
	ppm @ 3% O_2	n/a	4.4	10
	lb/hr	n/a	6.9	--
	lb/MMBtu	n/a	0.0020	--
	lb/MMSCF	n/a	2.0	--

TABLE 2-1 (continued)
NRG EL SEGUNDO UNIT 3
FULL LOAD TEST RESULTS

		Baseline (no ammonia)	With ammonia injection	Limit
CO	ppm	n/a	32.10	--
	ppm @ 3% O_2	n/a	32.29	300
	lb/hr	n/a	86.2	--
	lb/MMBtu	n/a	0.024	--
	lb/MMSCF	n/a	25.0	--
SO_x	ppm	n/a	1.3	--
	ppm @ 3% O_2	n/a	1.4	--
	lb/hr	n/a	8.2	--
	lb/MMBtu	n/a	0.0023	--
	lb/MMSCF	n/a	2.4	--
ROG's	ppm	n/a	2.43	--
	ppm @ 3% O_2	n/a	2.52	--
	lb/hr	n/a	3.7	--
	lb/MMBtu	n/a	0.0010	--
	lb/MMSCF	n/a	1.1	--

TABLE 2-2
NRG EL SEGUNDO UNIT 3
250 MW TEST RESULTS

		Baseline (no ammonia)	With ammonia injection	Limit
Date		5/23/01	5/23/01	
Time		0937/1048	1155/1308	
O_2	%, dry	4.22	4.27	--
CO_2	%, dry	9.57	9.72	--
Stack Flow Rate	kacfm	720.1	699.4	--
	kdscfm	466.7	452.3	--
Stack Temperature	^oF	201.3	203.1	--
H_2O	%	17.2	17.2	--
NO_x	ppm	66.2	4.77	--
	ppm @ 3% O_2	71.1	5.14	--
	lb/hr	224.7	15.7	--
	lb/MMBtu	0.085	0.006	--
	lb/MMSCF	87.7	6.3	--
PM	gr/dscf	0.0021	0.0024	0.1
	lb/hr	8.5	9.2	--
NH_3	ppm	n/a	3.0	--
	ppm @ 3% O_2	n/a	3.3	10
	lb/hr	n/a	3.7	--
	lb/MMBtu	n/a	0.0015	--
	lb/MMSCF	n/a	1.5	--

TABLE 2-3
NRG EL SEGUNDO UNIT 3
170 MW TEST RESULTS

		Baseline (no ammonia)	With ammonia injection	Limit
Date		5/24/01	5/24/01	
Time		0743/0855	0945/1057	
O_2	%, dry	4.48	4.51	--
CO_2	%, dry	9.54	9.51	--
Stack Flow Rate	kacfm	450.0	465.0	--
	kdscfm	301.5	313.1	--
Stack Temperature	^oF	180.9	182.4	--
H_2O	%	17.1	16.5	--
NO_x	ppm	45.33	3.52	--
	ppm @ 3% O_2	49.41	3.84	--
	lb/hr	99.4	8.0	--
	lb/MMBtu	0.059	0.005	--
	lb/MMSCF	61.0	4.7	--
PM	gr/dscf	0.0018	0.0018	0.1
	lb/hr	4.6	4.7	--
NH_3	ppm	n/a	0.6	--
	ppm @ 3% O_2	n/a	0.7	10
	lb/hr	n/a	0.55	--
	lb/MMBtu	n/a	0.0003	--
	lb/MMSCF	n/a	0.32	--

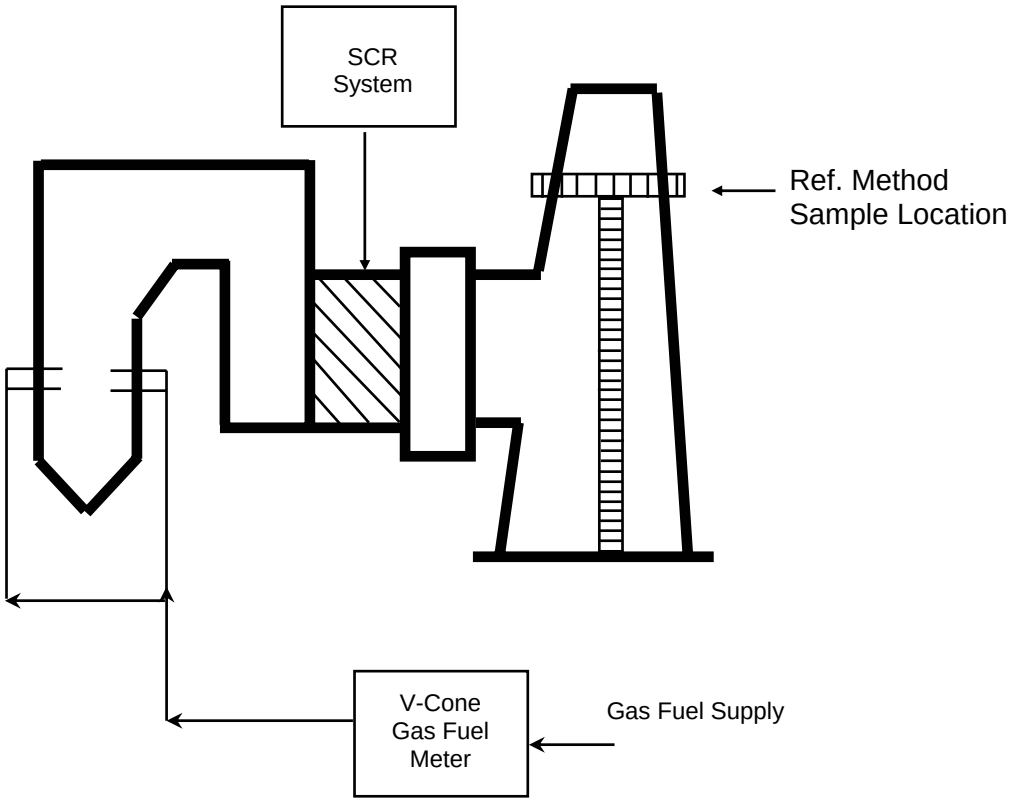
TABLE 2-4
NRG EL SEGUNDO UNIT 3
85 MW TEST RESULTS

		Baseline (no ammonia)	With ammonia injection	Limit
Date		5/25/01	5/25/01	
Time		0100/0212	0303/0416	
O_2	%, dry	7.85	7.90	--
CO_2	%, dry	7.41	7.45	--
Stack Flow Rate	kacfm	307.9	299.2	--
	kdscfm	222.4	218.2	--
Stack Temperature	^oF	157.6	154.6	--
H_2O	%	13.8	13.4	--
NO_x	ppm	17.77	1.57	--
	ppm @ 3% O_2	24.38	2.16	--
	lb/hr	28.7	2.5	--
	lb/MMBtu	0.029	0.003	--
	lb/MMSCF	30.2	2.7	--
PM	gr/dscf	0.0010	0.0007	0.1
	lb/hr	1.9	1.3	--
NH_3	ppm	n/a	0.2	--
	ppm @ 3% O_2	n/a	0.3	10
	lb/hr	n/a	0.11	--
	lb/MMBtu	n/a	0.0001	--
	lb/MMSCF	n/a	0.12	--

4.0 PROCESS AND EQUIPMENT DESCRIPTION

NRG El Segundo (Facility ID#115663), Unit 3 (Device ID# D11) consists of a utility boiler and steam turbine electric generator. The boiler and generator have a full load rating of 335 megawatts. The boiler is capable of firing natural gas or a combination of natural gas and refinery gas. Figure 4-1 presents a block diagram of the unit.

FIGURE 4-1
SIMPLIFIED PROCESS BLOCK DIAGRAM
NRG EL SEGUNDO UNIT 3



5.0 PROCESS CONDITIONS DURING THE TEST

All tests were performed while the unit was in normal, steady-state operation. The SCR system was operated per the manufacturer's instructions during all tests. Tests were performed at four operating loads. At each operating load, one set of tests were performed with no ammonia injection (baseline) and one set of tests were performed with ammonia injection. Table 5-1 provides the unit operations data during each test.

TABLE 5-1
NRG EL SEGUNDO UNIT 3 COMPLIANCE TESTS
UNIT OPERATING CONDITIONS

Nominal Load		250 MW		170 MW		85 MW		335 MW	
Condition		Baseline	with ammonia	Baseline	with ammonia	Baseline	with ammonia	Baseline	with ammonia
Test #		1	2	3	4	5	6	7	8
Date		5/23/01	5/23/01	5/24/01	5/24/01	5/25/01	5/25/01	5/29/01	5/29/01
Time		937/1048	1155/1308	743/855	945/1057	100/212	303/416	1030/1142	1241/1548
Load	net MW	244	244	167	166	82	82	325	326
Natural Gas									
Flow Rate	kscfh	2,345	2,344	1,633	1,630	906	911	3,118	3,103
HHV	Btu/SCF	1,031	1,031	1,032	1,032	1,034	1,031	1,029	1,031
F-Factor	dscf/MMBtu	8,586	8,586	8,586	8,586	8,585	8,586	8,586	8,586
Refinery Gas									
Flow Rate	kscfh	0	0	0	0	0	0	0	0
NH_3 Flow									
East	lb/hr	0	132.2	0	64.8	0	16.7	0	227.4
West	lb/hr	0	143.6	0	64.6	0	16.5	0	226.8
Total	lb/hr	0	275.8	0	129.4	0	33.2	0	454.2

6.0 REFERENCE METHOD SAMPLING TECHNIQUES

Table 6-1 summarizes the test methods and techniques which were used as the reference methods. The test matrix was developed to meet the requirements of the facility Permit. The permitted emission limits are summarized in Table 6-2. Table 6-3 shows the test matrix which was performed at each operating condition. The following sections describe each method in further detail. Flue gas Oxygen and Carbon Dioxide concentration were measured in conjunction with all tests using SCAQMD Method 100.1. The flue gas flow rate was measured in conjunction with the particulate tests. This flue gas flow rate was used for all emission rate calculations of NO_x, CO, NH_3, PM, ROG's and SO_x. The fuel heating value and F-Factor, as recorded by the facility gas chromatograph, were recorded during each test and used for the lb/MMBtu and lb/MMSCF calculations.

TABLE 6-1
TEST METHODS

Parameter	Method	Measurement Principle	Number of Runs(1)	Test Duration
NO_x	SCAQMD 100.1	Chemiluminescence	1	64 minutes
CO	SCAQMD 100.1	NDIR/Gas Filter Correlation	1(2)	64 minutes
NH_3	SCAQMD 207.1	Colorimetery	1(3)	60 minutes
SO_x	SCAQMD 6.1	Titration	1(2)	60 minutes
PM	SCAQMD 5.2	Gravimetric	1	64 min
VOC	Draft SCAQMD 25.3	GC	2(2)	~50 min.

1) Per test operating condition
2) CO, SO_2, and ROG tests were performed only at full load with ammonia injection
3) Ammonia tests were performed only for the test conditions with ammonia injection

TABLE 6-2
NRG EL SEGUNDO UNIT 3
PERMITTED EMISSION LIMITS

Parameter	Units	Limit	Rule
NO_x	--	--	2012
CO	ppm @ 3% O_2	300	1303(b)(2)
NH_3	ppm @ 3% O_2	10	1303(a)(1)
Particulate	gr/DSCF	0.1	409
SO_x	tons/year	182	40 CFR Part 72
ROG's	--	--	--

ATTACHMENT 2

MAY 14, 2010 SCAQMD ENGINEERING EVALUATION
PROPOSED ESPR PROJECT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	PAGES 48	PAGE 1
ENGINEERING AND COMPLIANCE DIVISION	APPLICATION NO. 470652 (Master File)	DATE Rev 5-14-2010.
ENGINEERING ANALYSIS / EVALUATION	PROCESSED BY: Ken Coats	REVIEWED BY:

EL SEGUNDO POWER, LLC
SECOND ADDENDUM TO THE DETERMINATION OF COMPLIANCE

COMPANY NAME AND ADDRESS

El Segundo Power, LLC
301 Vista Del Mar
El Segundo, CA 90245

Contact: Mr. George Piantka, P.E.
AQMD Facility ID: 115663

EQUIPMENT LOCATION

301 Vista Del Mar
El Segundo, CA 90245

EQUIPMENT DESCRIPTION

Section H of the Facility Permit

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions And Requirements	Conditions
Process 1: INTERNAL COMBUSTION					
System 2: GAS TURBINE, POWER GENERATION					
GAS TURBINE, UNIT NO. 5, NATURAL GAS, SIEMENS MODEL SGT6-5000F, RAPID-RESPONSE COMBINED CYCLE, 2,096 MMBTU/HR AT 78 DEGREES F, WITH DRY LOW-NOX COMBUSTORS WITH A/N 470652 GENERATOR, HEAT RECOVERY STEAM, UNFIRED STEAM TURBINE, 67.7 MW GENERATOR, 219 MW	D67	C75	NOX: MAJOR SOURCE	**CO:** 2.0 PPMV NATURAL GAS (4) [Rule 1703(a)(2)-PSD-BACT]; **CO:** 2000 PPMV (5) [Rule 407] **NOX:** 15 PPMV NATURAL GAS (8) [40CFR60 Subpart KKKK] **NOX:** 16.55 LB/MMCF NATURAL GAS (1) [Rule 2012] **NOX:** 8.66 LB/MMCF NATURAL GAS (1A) [Rule 2012] **NOX:** 2.0 PPMV NATURAL GAS (4) [Rule 2005-BACT, Rule 1703(a)(2)-PSD-BACT]; **VOC:** 2.0 PPMV (4) [Rule 1303(a)(1)-BACT] **PM10:** 0.01 GRAIN/DSCF (5) [Rule 475]; **PM10:** 0.1 GRAIN/DSCF (5A) [Rule 409]; **PM10:** 11 LB/HR (5B) [Rule 475 **SOX:** 0.06 LB/MMBTU (8) [40 CFR60 Subpart KKKK] **SO2:** (9) 40CFR72-Acid Rain Provisions	A63.2, A99.7, A99.8, A99.9, A99.10, A99.11, A195.8, 195.9, A195.10, A327.1, A433.1, B61.2, C1.6, D12.10, D29.7, D29.8, D29.9, D82.4, D82.5, E193.2, E193.3, I296.2, K40.4, K67.5

Appendix A - EL SEGUNDO POWER, LLC
Siemens SGT6-5000FCTG Hourly Emissions - Normal Operations

PAGES	PAGE	A/N 470652
BY KLC	DATE 8/26/07	

PM10 Emissions

Operating Condition Number	Heat Input (MMBTU/hr)	Emission Factor (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
1	1,881.0	0.0045	8.52	8.52
2	1,951.0	0.0045	8.84	8.84
3	2,096.0	0.0045	9.49	9.49
4	1,155.0	0.0045	5.23	5.23
Average			**8.02**	**8.02**

SOx Emissions

Operating Condition Number	Heat Input (MMBTU/hr)	Emission Factor[1] (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
1	1,881.0	0.00070	1.317	1.317
2	1,951.0	0.00070	1.366	1.366
3	2,096.0	0.00070	1.467	1.467
4	1,155.0	0.00070	0.809	0.809
Average			**1.240**	**1.240**

[1] Based on a maximum sulfur content of 0.25 grains/100 scf fuel; 1,050 BTU/scf natural gas; and 7,000 grains/lb, and 1 mole S for 2 moles SO_2

SOx = (0.25 gr/100scf)(1 scf/1,020 BTU)(lb/7,000 gr)(2 mol SO_2/1 mol S) = 0.00070 lb/MMBTU

Appendix F - EL SEGUNDO POWER, LLC
Emission Factors

PAGES	PAGE	A/N 470652
BY KLC	DATE 8/26/07	

Emission Factors During Non-Commissioning Period

Operating Condition 3	Hours per Year	Hourly Fuel Use (MMBtu/hr)	Natural Gas HHV (Btu/scf)	Fuel Use (MMscf/yr)	CO (lbs/year)	NOX (lbs/year)	VOC (lbs/year)	PM10 (lbs/year)	SOx (lbs/year)
Unit 8 Start-Up	200	2,096	1,028	408	83,484	11,206	3,460	1,900	292
Unit 8 Normal Operations	5,056	2,096	1,028	10,309	47,526	78,065	27,151	48,032	7,382
Unit 8 Shutdown	200	2,096	1,028	408	44,236	7,100	1,948	1,900	292
Unit 8 Totals	5,456			11,124	175,246	96,371	32,559	51,832	7,966
Unit 9 Start-Up	200	2,096	1,028	408	83,484	11,206	3,460	1,900	292
Unit 9 Normal Operations	5,056	2,096	1,028	10,309	47,526	78,065	27,151	48,032	7,382
Unit 9 Shutdown	200	2,096	1,028	408	44,236	7,100	1,948	1,900	292
Unit 9 Totals	5,456			11,124	175,246	96,371	32,559	51,832	7,966

	CO	NOX	VOC	PM10	SOx
Unit 8					
Annual Emissions (lbs/yr)	175,246	96,371	32,559	51,832	7,966
Annual Fuel Use (MMscf/yr)	11,124	11,124	11,124	11,124	11,124
Emission Factor (lbs/MMscf)	**15.75**	**8.66**	**2.93**	**4.66**	**0.72**
Unit 9					
Annual Emissions (lbs/yr)	175,246	96,371	32,559	51,832	7,966
Annual Fuel Use (MMscf/yr)	11,124	11,124	11,124	11,124	11,124
Emission Factor (lbs/MMscf)	**15.75**	**8.66**	**2.93**	**4.66**	**0.72**

ATTACHMENT 3

ROLLS-ROYCE LETTER REGARDING TRENT 60 UNITS

Rolls-Royce Canada Limitée
9545 Côte-de-Liesse
Dorval, QC H9P 1A5

Tel. (514) 636-0964
FAX (514) 633-7931

Mr. Steve Rose
Sr Director - Development Support
NRG Energy, Inc
Engineering & Construction
Houston Pavilions Office Tower
1201 Fannin,
Houston, TX 77002

Subject: **Permit Applications for the El Segundo Power Redevelopment Project located at 301 Vista Del Mar, El Segundo, CA 90245**

Dear Mr. Rose,

In response to the requests for further information for air permitting, the following information is provided on emissions and the technology of the Trent 60.

With regards to the emissions levels, Rolls-Royce expects that the nominal PM10/PM2.5 emissions will be lower than 5.0lb/hr. This is based on site testing carried out in accordance with Rolls-Royce and EPA test procedures. Taking into account variability and the potential testing uncertainty we are in a position to guarantee 5.0lb/hr assuming Rolls-Royce and EPA test procedures and standards are met.

The Trent is the most efficient aero derivative simple cycle gas turbine. It uses three shafts, has a high pressure ratio and advanced aerospace components to maximize thermal efficiency. It also uses a high technology DLE combustion system to minimize emissions, compliant with existing worldwide legislation. The inlet spray intercooling (ISI) acts as progressive intercooler throughout the early stages of the compression system where the evaporation of water gives cycle benefits. It is therefore our opinion that it meets the definition of an advanced combustion resource as specified in rule 1135.

Sincerely,

RJ Hamby

Richard Hamby

Head of Thermal Power Engineering, Energy
Rolls-Royce Canada, 9545 Côte-de-Liesse, Dorval, Québec H9P 1A5

ATTACHMENT 4

PEERLESS LETTER REGARDING SCR/OXIDATION CATALYSTS

PEERLESS Mfg. Co.
MAKING ENERGY SAFE, EFFICIENT, AND CLEAN

CORPORATE HEADQUARTERS
14651 North Dallas Parkway
Suite 500
Dallas, TX 75254

Telephone 214-357-6181
FAX 214-351-0194
www.peerlessmfg.com

Mr. Steve Rose
Sr. Director - Development Support
NRG Energy, Inc.
Engineering & Construction
Houston Pavilions Office Tower
1201 Fannin, Houston, TX 77002

Subject: Permit Applications for the El Segundo Power Redevelopment Project located at 301 Vista Del Mar, El Segundo, CA 90245

Dear Mr. Rose,

Peerless Mfg. Co, , has proposed emissions controls systems for CO, VOC and NO_x emission abatement behind Rolls-Royce Simple-Cycle Trent combustion turbines for the application of NRG's El Segundo Power Redevelopment Project. Peerless proposed package has been designed to achieve the following outlet levels of emissions for each combustion turbine:

CO Emissions
Peerless proposes oxidation catalyst for CO emissions designed to meet less than or equal to 4.0 ppmvd@15%O_2

VOC Emissions
Peerless proposes oxidation catalyst for VOC emissions designed to meet less than or equal to 2.0 ppmvd@15%O_2 (non-methane, non-ethane and 50% unsaturated hydrocarbons)

NO_x and NH_3 Emissions
Peerless proposes Selective Catalytic Reduction (SCR) designed to control NO_x and NH_3 emissions. The SCR is designed to meet emissions for NO_x less than or equal to 2.5 ppmvd@15%O_2 and NH_3 less than or equal to 5.0 ppmvd@15%O_2

Peerless having successfully installed more than 80 simple-cycle exhaust emission control systems behind Rolls-Royce and other gas turbine applications, uses a proprietary and modularized package with a compact footprint estimated at 40 feet wide by 90 feet long including tempering air fans.

Sincerely,

Tim Shippy
Director, Environmental Systems MBU
Peerless Mfg. Co.
146551 North Dallas Parkway Suite 500
Dallas, TX 75254

sierra research

1801 J Street
Sacramento CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor MI
Tel: (734) 761-6666
Fax: (734) 761-6755

May 22, 2013

Kenneth L. Coats
AQ Engineer II
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

Subject: El Segundo Power Facility Modification Project – NO_2 Increment Consumption Analysis

Dear Mr. Coats:

This letter addresses a component of the air quality impact analysis for the March 2013 permit application package for the proposed El Segundo Power Facility Modification Project. PSD Regulations require an Increment Consumption Analyses for certain PSD pollutants. Within the jurisdiction of the SCAQMD, the applicable requirements for all pollutants except GHGs are in Regulation XVII, because SCAQMD's authority to implement PSD is by virtue of its SIP-approved PSD rule.

The Air Quality Impact Analysis (AQIA), submitted on April 12, 2013, demonstrated that the annual NO_2 and all CO emissions impacts are below the PSD SILs and preconstruction monitoring thresholds, and the PM_{10} impacts are below the District significant change thresholds. The AQIA also indicated that an increment consumption analysis would be required for NO_2 because the maximum 1-hour NO_2 impact exceeded the federal Significant Impact Level (SIL).

The District's increment-consumption analysis requirement is contained in Rule 1703(a)(3)(C)(ii). This rule requires an analysis that demonstrates that the project, in conjunction with all other applicable emission increases or reductions (including secondary emissions), will not cause or contribute to a violation of any applicable maximum allowable increase over the baseline concentration in any area.

The applicable maximum allowable increase over the baseline concentration for NO_2 is specified in Rule 1702(q). For Class II areas, the allowable increase is 25 micrograms per cubic meter, annual arithmetic mean. No increment has been adopted by EPA or the District for a shorter averaging time. EPA determined in 2005 that the annual increment satisfies the criteria for prevention of significant deterioration under the Clean Air Act.[1]

District staff has indicated that there are no other sources that have consumed NO_2 increment in the project area. Therefore, the increment consumption analysis only considers the impact from recent projects at the facility. The air quality impact analysis

[1] 70 FR 59582.

for the ESPFM, submitted on April 12, 2013, demonstrated that the cumulative impact from all facility sources (0.6 μg/cu m, annual average)[2] will be well below the District's allowable increase level for NO_2.

Because there is no increment for 1-hour NO_2, and because the project will not cause or contribute to an increment violation for annual NO_2, the project will comply with the increment consumption requirements of Regulation XVII.

If you have any questions regarding this matter, please do not hesitate to contact George Piantka at 760-710-2156 or me at 916-273-5139.

Sincerely,

Tom Andrews
Senior Engineer

cc: Craig Hoffman, CEC Project Manager
George Piantka, NRG
Ken Riesz, NRG
Steve Odabashian, NRG

[2] *Ambient Air Quality Impact Analysis* (April 12, 2013), Table 6.