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September 4, 2007

Mr. Howard Gebhart
Air Resources Specialists, Inc.
1901 Sharp Point Drive, Suite E
Fort Collins, CO 80525

Subject: August 6, 2007 Questions Regarding Victorville 2 Hybrid Power Project PSD Application

Dear Howard,

This letter is in response to the questions in your August 6, 2007, e-mail regarding the Victorville 2 Hybrid Power Project Prevention of Significant Deterioration (PSD) permit application. The questions from your e-mail are repeated below in italics, followed by our responses.

1. Please document the emissions used in the CALPUFF modeling and show their derivation. I am interested primarily in how the emissions used in the CALPUFF modeling incorporate the start-up/shutdown emissions. I am also interested in the particle speciation assumptions used in deriving the modeled emissions.

The emissions are documented in the application in Section 5 and Appendix C. We did not model specific start-up/shutdown (SU/SD) cases for the Class I area modeling. ENSR is aware this has been requested for a few coal-fired power plants, but we are not aware of combined-cycle projects where SU/SD cases have been requested by the Federal Land Managers (FLMs). The SU for a combined-cycle plant is relatively short, especially so for the Victorville 2 project which will employ GE's Rapid Start Process; even a cold start is less than two hours in duration. Since there will be a lower flow rate during startup, the likely worst case condition that would transport the emissions 40 km or more will be the 100 percent load case where the same stack parameters could last all 24-hours. There is no good way to incorporate 1.3 - 1.8 hours of SU, .5 hours of SD and the rest at 100% load in CALPUFF modeling. The emissions and stack parameters at 100 percent load that were used in the CALPUFF modeling are provided in Table 1.

As cited in the Class I modeling protocol, ENSR followed FLM guidance to speciate particulate matter emissions for the modeling. The speciation was as follows: 75 percent of the PM10 was assumed to be condensable PM10 and 25 percent was assumed to be filterable PM10. The condensable PM10 was assumed to be secondary organic aerosols (SOA), and the filterable PM10 was assumed to be 100% fine soils.

Table 1 Stack Parameters and Emissions Data for the Combustion Turbines

Parameter		Value	
		Unit 1 (West)	Unit 2 (East)
UTM Coordinate East (meters) [a]		466,040.77	466,080.94
UTM Coordinate North (meters) [a]		3,832,160.30	3,832,159.92
Stack Base Elevation (ft)		2,802	2,802
Stack Height (ft)		145	145
Stack Diameter (inches)		222	222
Load		100%	
Exit Temperature (°F)		174.5	
Exit Velocity (ft/sec)		58.14	
Pollutant Emissions Per Combustion Turbine (lb/hr)[b]	NO_x	15.6	
	CO	14.25	
	PM10/PM2.5	18.0	
	SO_2	1.204	
	H_2SO_4	0.461	

[a] Coordinates for UTM Zone 11 referenced to Datum NAD27
[b] Emissions are for each turbine

2. In VISCREEN, the modeled emissions are shown as 31.2 lb/hr for NOx and 36 lb/hr for PM-10. Do these emissions address the extra emissions that occur during start-up/shutdown? In other PSD applications, the FLMs have requested that VISCREEN modeling also address start-up/shutdown emissions because of the short-term nature of visible plume impacts (although it is also recognized that any such impacts would have limited frequency). As necessary, please provide an assessment of visibile plume impacts using VISCREEN during start-up/shutdown periods.

The VISCREEN modeling in the application did not address emissions during SU/SD. A revised analysis has been conducted to address potential visible plume impacts in Class I areas caused by SU/SD emissions.

VISCREEN modeling requires specification of PM10 and NO_x emissions. Table 2 provides a summary of NO_x emissions during SU/SD operations. PM10 emissions are expected to be less than the 100% load during SU/SD operations. As shown in Table 1, normal operation PM10 emissions at 100% load are 18.0 lb/hr per turbine stack, and this value was conservatively assumed during SU/SD. Table 2 also indicates the duration of each mode of operation.

Table 2 Summary of Combustion Turbine NO_x Emissions by Operating Mode

Operating Mode	Duration	NO_x lb/stack
Hot/warm Start	1.3	40
Cold Start	1.8	96
Shutdown	0.5	57
Normal	1-24	15.6

The Class I Cucamonga Wilderness Area (WA) is 40 km (25 miles) from the proposed project location. The worst-case meteorological conditions identified in the Level 2 visibility screening analysis was C stability and wind speed of 3 m/sec (6.7 mph). Therefore, plume transport from the project to the Cucamonga WA would take approximately four hours (i.e., 25 miles/6.7mph = 3.7 hours). Based on the limited duration of the SU/SD modes, we developed a composite four-hour emission scenario. The worst-case average hourly emission rate for a four-hour period was estimated assuming that a cold-start (1.8 hours duration) is followed by normal operation for the remaining 2.2 hours of the four hours. The hourly emission rate for input to VISCREEN was computed as follows:

96 lb x (1.8 hr/4 hr) + 15.6 lb (2.2 hr/4 hr) = 51.78 lb/hr per turbine x 2 turbines
= 103.6 lb/hr for two turbines.

The Level 2 VISCREEN model was re-run with PM10 emissions of 36 lb/hr and NO_x emissions of 103.6 lb/hr. The results are summarized in Table 3. As shown in the table, the results are still well below the plume perceptibility and plume contract criteria.

Table 3 VISCREEN Results Including Start-up/Shutdown Emissions

Background	Distance	Plume Perceptibility (ΔE)		Plume Contrast (C_p)	
		VISCREEN	Criteria	VISCREEN	Criteria
Sky	40	0.068	2.00	0.001	0.05
Terrain	40	0.166	2.00	0.001	0.05

3. Please clarify Table 6-12 (Page 6-14). The table heading describes the data in this table as the "frequency" of occurrence for each dispersion condition, but the data were used in the report as if the data were actually the "percentage" each dispersion condition occurs.

The data in Table 6-12 are percentages of the time, not fractions of the time. For example, a frequency of 0.152 of F stability, 1 m/sec wind during hours 0-6 equals 13.3 hours/year. The headings on the table should have read "Frequency by Time of Day (percent)" and "Cumulative Frequency by Time of Day (percent)", respectively.

Please contact me or Brian Stormwind in ENSR (978-589-3000) if you have any additional questions.

Sincerely yours,

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