

ATTACHMENT 2

EMISSIONS SPREADSHEETS

QUARTERLY OFFSET SPREADSHEETS

JULY 23, 2004 COMMENTS ON PDOC

**AUGUST 2, 2004 SUPPLEMENTAL
COMMENTS ON PDOC**

NO_x Emission Calculations

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom								
Start Up Emissions for Two Turbines lbs/qtr	1339	3753	2305	6090	521	1084	1474	3867		
Base Load Emissions Per Turbine	4530	4712.5	3730	4059.5	4250	4450.5	4410	4628.5		
Base Load Emissions Two Turbine	9060	9425	7460	8119	8500	8901	8820	9257		
Peak Load Emissions Per Turbine	2500	2560	1600	1640	4237.5	4510	2564	2600		
Peak Load Emissions Two Turbine	5000	5120	3200	3280	8475	8680	5128	5200		
Turbine Total Pounds	15399	18298	12965	17489	17496	18665	15422	18324		
Turbine Total Tons	7.6995	9.149	6.4825	8.7445	8.748	9.3325	7.711	9.162		
Fire Pump Emission Rate(pound/test)	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72		
test/Quarter fire pump	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5		
Fire Pump Emission	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5		
Emergency Generator Emission Rate (lb/test)	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24		
test/Quarter Emergency Generator	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5		
Emergency Generator Emission lb/qtr	28	28	28	28	28	28	28	28		
Cooling Tower (lb/hr)	0	0	0	0	0	0	0	0		
Hrs/Quarter Cooling Tower	2160	2160	2184	2184	2208	2208	2208	2208		
Cooling Tower Emissions	0	0	0	0	0	0	0	0		
Auxiliary Boiler (lb/hr)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		
Hrs/Quarter Auxiliary Boiler	140	140	568	568	143	143	143	143		
Auxiliary Boiler Emissions	98	98	397.6	397.6	100.1	100.1	100.1	100.1		
Turbine Total Pounds	15399	18298	12965	17489	17496	18665	15422	18324		
Total Pounds	15546.5	15546.5	13412.1	13412.1	17645.6	17645.6	15571.6	15571.6	62175.8	
Total Tons	7.77	7.77	6.71	6.71	8.82	8.82	7.79	7.79	31.09	

NO_x Emission Calculations

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines lbs/qr	445	1022.3	1640.8	4277	1378.8	3814.1	2087.5	5680.2		
Base Load Emissions Per Turbine	4462	4520	2610.5	2640	4249	4300	4240.5	4300		
Base Load Emissions Two Turbine	8924	9040	5221	5280	8498	8600	8481	8600		
Peak Load Emissions Per Turbine	910	940	60	70	2850	2880	830	850		
Peak Load Emissions Two Turbine	1820	1880	120	140	5620	5760	1660	1700		
Turbine Total Pounds	11189	11942.3	6981.8	9697	15496.8	18174.1	12228.5	15980.2		
Turbine Total Tons	5.5945	5.97115	3.4909	4.8485	7.7484	9.08705	6.11425	7.9901		
Fire Pump Emission Rate(pound/test)	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72		
test/Quarter fire pump	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5		
Fire Pump Emission	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5		
Emergency Generator Emission Rate (lb/test)	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24		
test/Quarter Emergency Generator	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5		
Emergency Generator Emission lb/qr	28	28	28	28	28	28	28	28		
Cooling Tower (lb/hr)	0	0	0	0	0	0	0	0		
Hrs/Quarter Cooling Tower	2160	2160	2184	2184	2208	2208	2208	2208		
Cooling Tower Emissions	0	0	0	0	0	0	0	0		
Auxiliary Boiler (lb/hr)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		
Hrs/Quarter Auxiliary Boiler	140	140	568	568	143	143	143	143		
Auxiliary Boiler Emissions	98	98	397.6	397.6	100.1	100.1	100.1	100.1		
Turbine Total Pounds	11189	11942.3	6981.8	9697	15496.8	18174.1	12228.5	15980.2		
Total Pounds	11336.5	11336.5	7428.9	7428.9	15646.4	15646.4	12378.1	12378.1	46789.9	46789.9
Total Tons	5.67	5.67	3.71	3.71	7.82	7.82	6.19	6.19	23.39	23.39

NOx ERC's for Roseville Energy Park

Before Ratios:	Universal		Q3	Q4	Total, tpy	Type	Location
	Q1	Q2					
Certificate	5050	5050	5050	5050	20,200	NOx	Placer
2001-23	33512	33512	33512	33512	134,048	VOC	Placer
2001-26	0	6888	0	3542	10,430	NOx	Yolo-Solano
EC-209	0	10620	0	4414	15,034	NOx	Yolo-Solano
EC-210	5300	5300	5250	4150	20,000	NOx	Placer

After Ratios and Y-S Hold-Back: (Certificates for surrender prior to construction)					NOx Ratio	VOC Ratio	Total Ratio	Y-S Hold-Back	
2001-23	2525	2525	2525	2525	10100	5.05	2.0	1.0	2.0
2001-26	6445	6445	6445	6445	25778	12.89	2.0	2.6	5.2
EC-209	0	2952	0	1518	4470	2.24	2.1	1.0	2.1
EC-210	0	4551	0	1892	6443	3.22	2.1	1.0	2.1
Subtotals	8970	16473	8970	12379	46792	23.396			
Target by Quarter	11,337	7,429	15,647	12,379	46,792	23.396			

From Q1 8970 100.00% Pct. Of available quarter credits

From Q2	2367	7429	6677	8970	100.00%
From Q3					
From Q4				12379	100.00%

Quarter Totals 11,337 7,429 15,647 12,379 46,792

Pct of needed 100.00% 100.00% 100.00% 100.00%

After Ratios and Y-S Hold-Back: (Including anticipated certificates))

2001-23	2525	2525	2525	2525	10100	5.05		
2001-26	6445	6445	6445	6445	25778	12.89		
EC-209	0	2952	0	1518	4470	2.24		
EC-210	0	4551	0	1892	6443	3.22		
Energy 2001, Inc.*	4077	4077	4038	3192	15385	7.69	1.3	1.0
Subtotals	13047	20550	13008	15572	62,176	31.09		
Target by Quarter	15,546	13,412	17,646	15,572	62,176	31.09		

From Q1 13,047 100.00% Pct. Of available quarter credits

From Q2	2500	13412	4638	20550	100.00%
From Q3				13008	100.00%
From Q4				15572	100.00%

Quarter Totals 15,547 13,412 17,646 15,572 62,176

Pct of needed 100.00% 100.00% 100.00% 100.00%

* Could also be SMAQMD Priority Bank Credits or from another Sacramento Valley Air Basin source

PM10 for Roseville Energy Park

Before Ratios: Certificate	Universal (pounds)			Universal Q4	Total, ppy	Total, tpy	Location
	Q1	Q2	Q3				
2001-22	2,578	22,263	16,085	15,916	56,842	28.42	Lincoln, Placer County
2001-24	22,680	-	13,440	22,680	58,800	29.40	Forresthill, Placer County
Totals	25,258	22,263	29,525	38,596	115,642	57.82	

After Ratios--Certificates for surrender prior to construction	Universal (pounds)			Universal Q4	Total, ppy	Total, tpy	PM10 Ratio
	Q1	Q2	Q3				
2001-22	1,983	17,125	12,373	12,243	43,725	21.86	1.3
2001-24	11,340	-	6,720	11,340	29,400	14.70	2.0
Totals	13,323	17,125	19,093	23,583	73,125	36.56	

Target by Quarter	Q1	Q2	Q3	Q4	Total, ppy	Total, tpy	Excess	(Based on GTX100-worst case) (No reduction of hours)
From Q1	17,673	15,513	19,168	19,158	71,512	35.76	-	
From Q2	13,323	15,513	19,093	19,158	67,087	32.58	1,612	
From Q3	4,350	75	19,168	19,158	43,725	21.86	-	
From Q4	17,673	15,513	19,168	19,158	71,512	35.76	0	
Totals	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	1,612	

Target by Quarter	Q1	Q2	Q3	Q4	Total, ppy	Total, tpy	Excess	(Based on LM600) (No reduction of hours)
From Q1	17,523	15,246	18,999	18,788	70,556	35.28	-	
From Q2	13,323	15,246	18,999	18,788	66,356	32.58	1,879	
From Q3	4,200	75	18,999	18,788	42,052	20.52	94	
From Q4	17,523	15,246	18,999	18,788	70,556	35.28	595	
Totals	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	2,569	

July 23, 2004

Mr. John Finnell
Placer County Air Pollution Control District
11464 B Avenue
Auburn, CA. 95603

Re: Roseville Electric PDOC Comments

Dear Mr. Finnell:

Thank you for the opportunity to comment on the PDOC for the Roseville Electric Project. We have reviewed the PDOC and have made the following comments and requests.

Construction Mitigation

We have reviewed the PCAPCD staff recommended mitigation techniques for the construction activities. We believe that the construction mitigation methods outlined in the CEC's Preliminary Staff Assessment (PSA) will allow the project to demonstrate that no additional impacts will occur due to these activities. Therefore, we propose that the construction mitigation techniques outlined in the PSA will be sufficient and no additional mitigation techniques are needed.

Specific Facility Conditions

Page 44, Condition 1 and 2: Please revise the following conditions to reflect updated NO_x emissions based upon available NO_x ERCs. Included with these comments is an attachment that summarizes the quarterly and annual NO_x emissions for both turbine technologies. Based upon available ERC's at this time, only the quarterly and annual NO_x emissions are proposed to change. The hourly, maximum hourly, daily, and maximum daily will not be modified from the current PDOC. Please also note that emissions of other criteria pollutants (CO, VOC, SO₂, and PM₁₀) are not being revised.

1. If the GE LM-6000 turbines are selected, emission offsets shall be provided for all calendar quarters for NO_x and PM-10 in the following amounts, at the offset ratio

specified in the condition 10. (Offsets are not required for CO, SOx and VOC emissions.)

Table 37 - GE LM6000 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NOx	15,571	13,412	17,626	15,576	31.09
PM-10	17,523	15,246	18,999	18,788	35.28

2. If the Alstom GX100 turbines are selected, emission offsets shall be provided for all calendar quarters for NOx and PM-10 in the following amounts, at the offset ratio specified in the condition 10. (Offsets are not required for CO, SOx and VOC emissions.)

Table 38 - ALSTOM GX100 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NOx	15,571	13,412	17,626	15,576	31.09
PM-10	17,854	15,513	19,378	19,158	35.95

Page 45, Condition 6: Please revise condition 6 to reflect EPA's acceptance of the VOC/NOx offset ratio of 5.2:1.

Condition 18: Please include language that states "Except during startup and shutdown, the SCR....."

Page 53: Condition 54: Please revise Table 42 to include Excursion in the Gas Turbine Limitations.

54. The emissions from the gas turbine after air pollution controls shall not exceed the following:

Table 42 - Gas Turbine PPMV Limitations Excluding Startup, Shutdown, and Excursion		
NOx	CO	VOC
2.0 ppmvd @ 15% O ₂ , 1-hour average	4 ppmvd @ 15% O ₂ , 3-hour average	2 ppmv @ 15% O ₂ , 3-hour average

Page 53, Condition 55: REP proposes the averaging period for the NO_x excursion language be changed from 1-hour to 15 minutes. REP further proposes, to allow for operating flexibility, that each quarter be allowed to have 24 fifteen minute excursion(s) rather than 6 one-hour excursions. Also note that the turbines are water injected, not steam injected. The proposed modified language is as follows:

56. The 2.0 ppmvd NO_x emission limit is averaged over 1 hour at 15 percent oxygen, dry basis. The limit shall not apply to the first twenty-four (24) 15-minute average NO_x emissions above 2.0 ppmvd, dry basis at 15% O₂, in any calendar quarter period for each combustion gas turbine provided that it meets all of the following requirements:

- A. This equipment operates under any one of the qualified conditions described below:
 1. Rapid combustion turbine load changes due to the following conditions:
 - i. Load changes initiated by the California ISO or a successor entity when the plant is operating under Automatic Generation Control; or
 - ii. Activation of a plant automatic safety or equipment protection system which rapidly decreases turbine load
 2. The first two 1-hour reporting periods following the initiation/shutdown of an evaporating cooling flow
 3. The first two 1-hour reporting periods following the initiation/shutdown of combustion turbine water injection
 4. The first two 1-hour reporting periods following the initiation of HRSG duct burners
 5. Events as the result of technological limitation identified by the operator and approved in writing by the District.

Page 57, Conditions 62 and 63: As discussed above, please revise the following conditions to reflect REP's revised quarterly and annual NO_x emissions.

62. If the GE LM6000 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	15,571	13,412	17,626	15,576	31.09
CO	21,625	19,737	23,500	23,322	44.09
VOC	6,046	5,188	6,596	6,514	12.17
PM ₁₀	17,523	15,246	18,999	18,788	35.28
SO ₂	3,331	2,838	3,630	3,587	6.69

63. If the Alstom GX100 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

Table 50- ALSTOM GX100 - FACILITY QUARTERLY EMISSION LIMITS					
POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	15,571	13,412	17,626	15,576	31.09
CO	27,121	33,872	28,515	30,202	59.86
VOC	5,832	7,455	6,672	6,890	13.42
PM ₁₀	17,854	15,513	19,378	19,158	35.95
SO ₂	3,400	2,893	3,709	3,663	6.83

Page 57, Condition 65: Insert the words “comm encement of construction of the cooling tower basin.”

Page 60, Condition 84: Insert the words “comm encement of construction of fire water pump foundation”.

Page 61, Condition 97: Insert the words “comm encement of construction of IC engine foundation”.

Please feel free to contact me at 805-569-6555 or by e-mail if you have any questions or comments regarding these proposed changes to the PDOC.

Sincerely,
ATMOSPHERIC DYNAMICS, INC.

Gregory S. Darwin

Gregory Darwin

Cc:REP
attachment

August 2, 2004

Mr. John Finnell
Placer County Air Pollution Control District
11464 B Avenue
Auburn, CA. 95603

Re: Roseville Electric PDOC Supplemental Comments

Dear Mr. Finnell:

Roseville Electric described in its Preliminary Comments to CEC Staff that it was modifying the operation of the REP to lower its emissions of NO_x to match its current offset package. Specifically, RE discussed this approach with Staff at the PSA Workshop and agreed to present in these PDOC Supplemental Comments a complete description of the modified operating profile.

At the PSA Workshop, RE discussed with Staff that it had obtained the right to purchase at least 10 tons of NO_x emissions from Energy 2001, Inc. These NO_x emission reductions will be created by Energy 2001, Inc. in the near future and likely before REP's commercial operation date. Energy 2001, Inc. has obtained air permit number AC-04-09 from the PCAPCD to install natural gas reciprocating engines at the Placer County landfill which will burn landfill gas. This facility is nearing completion of construction and is anticipated to commence operation shortly. Energy 2001, Inc. has entered into a Power Purchase Agreement (PPA) with RE, whereby RE will purchase this renewable energy as part of its electricity purchase portfolio. Based upon the addition of future controls to these engines, approximately 10 tons of NO_x ERCs are expected to be certified. RE has entered into an option agreement with Energy 2001, Inc. to purchase at least 10 tons of these NO_x ERCs.

Additionally, RE is conducting due diligence relating to purchasing up to 10 tons of NO_x emission reductions from the Sacramento Air Quality Management District (SMAQMD) from its Priority Reserve Program. SMAQMD has provided indications that the REP would qualify for this program. A future application will be made for these ERC's.

As discussed with Staff at the PSA workshop, RE requests that PCAPCD incorporate the following permit conditions in the FDOC to reflect RE's modified

operating schedule and corresponding reduction of NO_x emissions as well as to allow an increase in NO_x emissions of up to 10 tons based on the likely event that RE can secure up to 10 tons of NO_x emission reductions utilizing either the Energy 2001, Inc. ERCs or the SMAQMD Priority Reserve Program or a combination of both.

Page 44, Condition 1 and 2: Please revise the following conditions to reflect updated NO_x emissions based upon available NO_x ERCs. Included with these comments is an attachment that summarizes the quarterly and annual NO_x emissions for both turbine technologies. Based upon available ERC's at this time, only the quarterly and annual NO_x emissions are proposed to change. The hourly, maximum hourly, daily, and maximum daily will not be modified from the current PDOC. Please also note that emissions of other criteria pollutants (CO, VOC, SO₂, and PM₁₀) are not being revised. We have also revised the condition numbers to reflect either scenario.

1a. If the GE LM-6000 turbines are selected and RE secures NO_x ERCs in the amount of 31.09 tons, emission offsets shall be provided for all calendar quarters for NO_x and PM-10 in the following amounts, at the offset ratio specified in the condition 10. (Offsets are not required for CO, SO_x and VOC emissions.)

POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NO _x	15,546	13,412	17,646	15,572	31.09
PM-10	17,523	15,246	18,999	18,788	35.28

2a. If the Alstom GX100 turbines are selected, and RE secures NO_x ERCs in the amount of 31.09 tons, emission offsets shall be provided for all calendar quarters for NO_x and PM-10 in the following amounts, at the offset ratio specified in the condition 10. (Offsets are not required for CO, SO_x and VOC emissions.)

POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NO _x	15,546	13,412	17,646	15,572	31.09
PM-10	17,673	15,513	19,168	19,158	35.95

1b. If the GE LM-6000 turbines are selected and RE secures NO_x ERCs in the amount of 23.40 tons, emission offsets shall be provided for all calendar quarters for NO_x and PM-10 in the following amounts, at the offset ratio specified in the condition 10. (Offsets are not required for CO, SO_x and VOC emissions.)

Table 37b – GE LM6000 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NO _x	11,337	7,429	15,647	12,379	23.40
PM-10	17,523	15,246	18,999	18,788	35.28

2b. If the Alstom GX100 turbines are selected, and RE secures NO_x ERCs in the amount of 23.40 tons, emission offsets shall be provided for all calendar quarters for NO_x and PM-10 in the following amounts, at the offset ratio specified in the condition 10. (Offsets are not required for CO, SO_x and VOC emissions.)

Table 38b - ALSTOM GX100 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NO _x	11,337	7,429	15,647	12,379	23.40
PM-10	17,673	15,513	19,168	19,158	35.95

Page 57, Conditions 62 and 63: As discussed above, please revise the following conditions to reflect REP's revised quarterly and annual NO_x emissions based upon either the 23.4 ton per year or the 31.09 ton per scenario. We have re-numbered the conditions to reflect either NO_x scenario.

62a. If the GE LM6000 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

Table 49a – GE LM6000 - FACILITY QUARTERLY EMISSION LIMITS					
POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	15,546	13,412	17,646	15,572	31.09
CO	21,625	19,737	23,500	23,322	44.09
VOC	6,046	5,188	6,596	6,514	12.17
PM ₁₀	17,523	15,246	18,999	18,788	35.28
SO ₂	3,331	2,838	3,630	3,587	6.69

63a. If the Alstom GX100 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	15,546	13,412	17,646	15,572	31.09
CO	27,121	33,872	28,515	30,202	59.86
VOC	5,832	7,455	6,672	6,890	13.42
PM ₁₀	17,673	15,513	19,168	19,158	35.95
SO ₂	3,400	2,893	3,709	3,663	6.83

62b. If the GE LM6000 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	11,337	7,429	15,647	12,379	23.40
CO	21,625	19,737	23,500	23,322	44.09
VOC	6,046	5,188	6,596	6,514	12.17
PM ₁₀	17,523	15,246	18,999	18,788	35.28
SO ₂	3,331	2,838	3,630	3,587	6.69

63b. If the Alstom GX100 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO _x	11,337	7,429	15,647	12,379	23.40
CO	27,121	33,872	28,515	30,202	59.86
VOC	5,832	7,455	6,672	6,890	13.42
PM ₁₀	17,673	15,513	19,168	19,158	35.95
SO ₂	3,400	2,893	3,709	3,663	6.83

Please feel free to contact me at 805-569-6555 or by e-mail if you have any questions or comments regarding these proposed changes to the PDOC.

Sincerely,
ATMOSPHERIC DYNAMICS, INC.

Gregory S. Darwin

Gregory Darwin

Cc:REP
attachment