Meteorological Solutions Inc.

January 18, 2012

UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY

JAN 19 2012

DIVISION OF AIR QUALITY

Mr. John Jenks
Utah Division of Air Quality
195 North 1950 West
Salt Lake City, Utah 84114

Subject: Notice of Intent for Sevier Power Company Project Number N12529-0003 - Addendum

Dear Mr. Jenks:

Per the Utah Division of Air Quality (UDAQ) letter of December 7, 2011 (DAQE-GN125290003E-11), please find below our Sevier Power Company (SPC's) responses to the provided questions.

1. The NOI is not clear on the size of the proposed power plant. The plant is alternatively described as both a nominal 570 and a nominal 580 MW power plant. We request this be clarified.

The plant will be a nominal 580 MW power plant. The 570 MW, as found in the first sentence under Section 2.5, is a typographical error.

2. On page 2-2 of the NOI is Figure 2.1 which provides an aerial view of the proposed plant location. This view does not provide a scale or other identifiers representing relative distance. Similarly, while the plant boundary is presumably shown by the solid red overlay on the map, the plant layout is not represented and the wide angle of view would make identification of individual components difficult or impossible. While the figures on pages 2-5 through 2-8 provide some help, they do not fully explain the odd-shape of the plant layout shown in Figure 2.1. Specifically the long spur located on the left (western) edge of plant boundary is not identified.

Savage Surveying, the local surveyor measured the distance from the proposed plant to the LDS Church which is believed to be located in the center of the town of Sigurd. This distance is exactly 5,595.32 feet.

The long spur located on the left side of the drawing (assuming the Google Earth Image that was presented on page 2-2 of the NOI) is the emergency exit.

The location of the proposed equipment is indicated in the ledger located in the upper right hand corner of the drawing on page 2-5 of the NOI.

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3. The local dispersion modeling uses an emission rate of approximately 14 lb CO/hr for each combustion turbine and HRSG combination (CT/HRSG). This corresponds to a yearly emission total of 61.3 tons per year as shown below:

(14 lb/hr) x (8760 hr/year) x (1/2000 ton/lb) = 61.3 tons per year per CT/HRSG

However, Table 3-1 (on Page 3-2) lists a PTE for each CT/HRSG of 120.2 tons per year. Table 3-3 (Page 3-5) shows a maximum emission rate of either 13.0 lb/hr or 9.2 lb/hr depending on turbine manufacturer. Please explain these discrepancies and, as appropriate, submit an addendum to the annual PTE and/or dispersion modeling.

The modeling for the annual CO emissions is based on using the most conservative steady state emission hourly rate for CO from among all the turbine manufacturer load cases projected over an entire year at that rate. The model does not include the effects of any startup or shutdown events.

Regarding the PTEs listed in Table 3-1, these reflect the annual emissions from steady state operations but also include the effects of all the startup and shutdown events. Table 3-3 indicates the maximum emission rate from each turbine manufacturer based on a specific set of atmospheric conditions, namely the most likely "normal operation" corresponding to the average annual atmospheric site condition of 48 °F and 61% relative humidity.

Note that we have reexamined the vendor supplied predictions on the degree of effectiveness of the CO catalyst during startup and shutdown events. We believe that utilizing the turbine manufacturer's "best case" degree of effectiveness of the CO catalyst may be overly optimistic. Therefore, we have applied a lower and therefore more conservative degree of effectiveness of the CO catalyst based on other plant operational experience which has yielded higher CO emission PTEs as reflected in the revised Table 3-1. Correspondingly, we have updated Table 3-4 and NOI Appendices' A and B to reflect these same results. These revisions are presented in Attachment A.

4. A discussion on startup/shutdown emissions is found in section 3.2.2 of the NOI. Are these modeled using the emission values listed in table 3-4? Specifically, as the duration of a startup period can be greater than the averaging period of the National Ambient Air Quality Standards (NAAQS) for some pollutants, startup period emissions need to be analyzed (i.e. modeled) for comparison with the NAAQS.

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In the original NOI submittal, startup/shutdown (SU/SD) emissions were not modeled separately. Based on the revised Table 3-4 found in Attachment B, the most conservative startup/shutdown emission hourly rates for NO_x and CO from among all the turbine manufacturer load cases were modeled. For NO_x, the worst case SU/SD condition (specifically, cold start (GE)) is the most conservative SU/SD event. Thus, an average hourly emission rate of 118 lb/hr was input to AERMOD. For CO, the worst case SU/SD condition (specifically cold start (Siemens)) is the most conservative SU/SD event. Thus, an average hourly emission rate of 959 lb/hr was utilized by AERMOD.

The corresponding stack exhaust gas flows and temperatures during these SU/SD events above were difficult to determine accurately, especially if this is the first hour of startup e.g., when all the heating surfaces are relatively cool vs. later in the startup period resulting in progressively higher stack temperatures. However, based on information provided by the vendors, an exit velocity of 636,960 ACFM at 250 °F for the GE cold start (NO_x) and 661,860 ACFM at 275° F for the Siemens cold start (CO) are reasonably accurate.

The results of the SU/SD modeling are as follows:

NAAQS Compliance Demonstration for SPC Sources Only during Startup/Shutdown

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
NO_2	1-hour (GE)	114.2	38	152.2	189	80.5%
CO	1-hour (Siemens)	2919	4810	7729	40,000	19.3%
	8-hour (Siemens)	409.1	3208	3617	10,000	36.2%

The results of the SU/SD modeling are presented in Attachment B and on a CD which accompanies this letter.

5. There is a discussion on applicable regulations which constitutes Section 4 of the NOI. On page 4-4 regarding Prevention of Significant Deterioration (PSD) review, the PSD significant rates listed in Table 4-2 are incorrect. The values listed are for a source undergoing a modification, while the NOI submitted is for a proposed new facility. Therefore each pollutant being emitted must be reviewed with respect to the 100 Tons Per Year (TPY) threshold correctly identified on page 4-3 (first paragraph of Section 4.2). While the conclusion does not change, UDAQ requests that an addendum be submitted that correctly identifies the PSD thresholds and which pollutants are then subject to a PSD review.

Per email dated December 13, 2011 from John Jenks to Bruce Taylor (SPC) and Linda Conger (MSI), the information presented on page 4-4 of the NOI was correct and no changes need to be made to Table 4-2.

6. Also in Section 4, page 4-14 includes a discussion on the use of a Continuous Emissions Monitor (CEM) to demonstrate compliance with the acid rain requirements found in 40 CFR Part 75. The use of this CEM should be reviewed in conjunction with the discussion of greenhouse gas emissions found in Section 3.4 of the NOI.

Table 3-8 lists the individual and total CO_2e values. The analysis of potential Best Available Control Technology (BACT) for Green House Gas (GHG) emissions is found in Section 5.14 of the NOI. Recent discussions with Environmental Protection Agency (EPA) have raised two points not specifically included in the GHG section of the NOI submittal. Specifically, the need for periodic monitoring/stack testing to demonstrate compliance with a CO_2e emission limitation, and the need for an initial discussion on turbine efficiency which addresses net heat rate in addition to a mass per power output. UDAQ also believes that the mass per power output limitation proposed in Section 5.14.5 of the NOI is not adequately derived or justified, and that an appropriate limit should be derived based on the calculations found in Appendix E of the NOI.

The use of a CEM to demonstrate compliance with an imposed CO_2e emission limitation should be included under a new GHG subheading to be added to Section 4 of the NOI. In addition, a discussion on turbine efficiency involving net heat rate should be included in Section 5.14 of the NOI.

For further clarification on these points please refer to the two attached documents entitled: "Comparison between Lake Side II, Kennecott UPP and Russell City Energy Center" and DAQE-MN105720026-11 - Response to Comments received on Kennecott Utah Copper's Utah Power Plant Modification.

Section 4.0 has been revised to include a discussion that since SPC is subject to the requirements of the Acid Rain Program, a CO_2 CEMS will be used to demonstrate compliance with the requirements of Part 40 CFR Part 75. SPC will also report annual mass emissions of CO_2, N_2O, and CH_4 per the requirements of 40 CFR Part 98.

The CO_2e emissions estimate in tons per year was revised and is based on the maximum heat input rate of the combined cycle unit including both the combustion turbines and the heat recovery steam generators. The maximum heat input rate, regardless of vendor or operating conditions, was 4143.8 MMbtu/hr. This heat input rate occurred at an ambient temperature of -17°F (SPC Case #11/GE Case #14). Based on this maximum heat input rate, CO_2e was determined to be 1958552.1 MT/yr.

The proposed SPC facility will have an efficiency rating of approximately 7,515 Btu/kWhr and occurs at the extreme low ambient conditions of -17°F. The SPC facility will be located at approximately 5,303 feet above mean sea-level. The proposed heat input rate of each turbine is a maximum of 1916.5 MMBtu/hr. The proposed heat input to the duct burners will be as high as 540 MMBtu/hr.

Section 5.14 has been updated to include a discussion of turbine efficiency involving net heat rate. Attachment C presents revised Section 4.0, which includes new subsection 4.7, and revised Section 5.14 of the NOI.

7. It appears that a methodology was followed whereby the highest emission rate was chosen for each individual GHG separately and not by viewing the combination of all GHG emissions as a single total. This is incorrect. The highest set of emissions using the combined rates of all GHG emissions on an operating case by operating case approach should be used. This same point can be found in UDAQ's Response to Comments received on Kennecott Utah Copper's Utah Power Plant Modification document (see above). It also appears that there are errors in the calculations found on the second page of Appendix E of the NOI. The CO_2 emission total used is listed as 1,784,353.7 metric tons. This corresponds to Sevier Operating Case 4 (GE) as found on the first page of the appendix. However, Sevier Operating Case 11 (GE) has an emission total of 1,926,419.7 metric tons of CO_2. The emissions for N_2O and CH_4 are similarly affected, resulting in a significantly higher GHG emission total than listed in Section 3.4 of the NOI. This discrepancy should be explained or corrected, so that the appropriate GHG emission total is used.

To be consistent between vendors, calculations showed that Siemens case #4 (SPC case #4) produced GHG emissions of 2,565,862 MT/yr (CO_2e). This corresponded to average ambient conditions of 48°F and 61% relative humidity. Calculations for GE Case #14 (SPC Case #11) indicated GHG emissions to be 2,642,481 MT/yr (CO_2e), slightly higher than SPC case #4. Similar operating conditions used in SPC Case #11 were not made available by Siemens; thus the highest GHG emissions based on comparable cases from each vendor was presented in Table 3-8 of the original NOI submittal.

Section 3.4 and Table 3-8 of the NOI has been updated to present the highest GHG emission rates, regardless of vendor or operating conditions. Thus, the highest calculated GHG emissions, based on SPC operating case #11 and the maximum heat input rate, equates to a CO_2e estimate of 1,958,552.1 MT/yr. An updated Section 3.4, Greenhouse Gas Emissions is presented in Attachment A.

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If you have any questions, please feel free to contact me.
Sincerely,

Linda Conger

Linda Conger
Senior Air Quality Meteorologist
LEC:\\\BIG_MAX\share\msi_server\Msi\Projects\10-137 SPC Gas Plant\NOI PSD Permit\addendum letter.doc

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Attachment A
Revised NOI Tables 3-1, 3-4, 3-8 and Appendices A and B

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PM_{10} emissions were provided by each CT vendor. These emissions were then scaled by fuel input to the CT to determine emissions at partial loads. In addition, all primary sulfate emitted from the CTs plus sulfate converted from SO_2 by the SCR and CO catalysts are assumed to fully react with available SCR ammonia to form ammonium sulfate which was treated as both PM_{10} and $PM_{2.5}$.

3.1 Annual Potential to Emit

The annual potential-to-emit (PTE) criteria pollutant emissions presented in tons per year in Table 3-1 represent the highest projected emissions from each proposed CT vendor at average temperature and humidity (48°F and 61% RH) and at 100% load. These emissions are for the entire combined cycle power block (2 CTs/HRSGs) including 5,000 hours with supplemental duct firing. NO_x, CO, SO_2 and VOC emission estimates presented in Table 3-1 are based on Siemens supplied CT/HRSG data; PM_{10} and $PM_{2.5}$ emissions are based on GE supplied CT/HRSG data. The emissions from all other project affiliated equipment will not change, regardless of vendor chosen.

Table 3-1

Potential-to-Emit Annual Emission Estimates for SPC Project

Emission Source	NO_x (TPY)	CO (TPY)	SO_2 (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	VOC (TPY)	HAPS (TPY)
CT #1/HRSG[1234]	74.5	274.1	12.1	50.1	50.1	44	3.7
CT #2/HRSG[1234]	74.5	274.1	12.1	50.1	50.1	44	3.7
Auxiliary Boiler	6.3	14.0	0.9	3.7	3.7	2.2	0.69
Convection Heater #1	3.5	7.2	0.06	0.98	0.98	0.6	0.18
Convection Heater #2	3.5	7.2	0.06	0.98	0.98	0.6	0.18
Emergency Gen. & tank	4.7	0.7	0.19	0.04	0.04	0.19	0.005
Fire Pump & tank	1.3	0.1	0.25	0.02	0.02	0.03	0.003
Paved Roads	NA	NA	NA	0.06	0.01	NA	NA
Total Annual PTE	**168.3**	**577.4**	**25.7**	**106.0**	**106.0**	**91.6**	**8.5**

[1] Includes startup and shutdown emissions.
[2] NO_x, CO, SO_2 and VOC emission estimated based on Siemens supplied emissions data at average temperature and humidity, 100 load with duct firing.
[3] PM_{10} and $PM_{2.5}$ emission estimates based on GE supplied emissions data at average temperature and humidity, 100 load with duct firing.
[4] HAPS emissions based on HHV and Siemens performance data.

Table 3-4

Startup and Shutdown Emissions

	Cold Start		Warm Start		Hot Start		Shutdown	
	GE	Siemens	GE	Siemens	GE	Siemens	GE	Siemens
Time for Startup or Shutdown, minutes	242	250	134	125	87	87	24	27
Number of Starts Per Year	12	12	50	50	230	230	292	292
NO_x								
SUSD Emissions (per turbine), lb/hr	118	105	88	93	73	68	58	77
SUSD Emissions (per HRSG), lb/hr	0.85	3.6	0.85	3.6	0.85	3.6	0.85	3.6
Total NO_x SUSD Emissions (both CTs/HRSG's), tn/yr	5.7	5.3	9.8	9.7	24.4	22.6	6.8	10.1
CO								
SUSD Emissions (per turbine), lb/hr	450	959	273	912	264	720	726	782
SUSD Emissions (per HRSG), lb/hr	0.81	2.2	0.81	2.2	0.81	2.2	0.81	2.2
Total CO SUSD Emissions (both CTs/HRSG's), tn/yr	21.8	47.9	30.5	95.0	87.9	240.2	84.8	102.8
VOC								
SUSD Emissions (per turbine), lb/hr	33	110	14	99	16	92	27	97
SUSD Emissions (per HRSG), lb/hr	0.42	1.1	0.42	1.1	0.42	1.1	0.42	1.1
Total VOC SUSD Emissions (both CTs/HRSG's), tn/yr	1.6	5.5	1.6	10.3	5.5	30.8	2.6	12.7
$PM_{10}/PM_{2.5}$								
SUSD Emissions (per turbine), lb/hr	11	9	10	9	8	8	13	9
SUSD Emissions (per HRSG), lb/hr	0.96	3.1	0.96	3.1	0.96	3.1	0.96	3.1
Total $PM_{10}/PM_{2.5}$ SUSD Emissions (both CTs/HRSG's), tn/yr	0.5	0.43	1.1	0.93	2.7	2.6	1.6	1.2
SO_2								
SUSD Emissions (per turbine), lb/hr	1.9	1.6	2.3	2.9	2.7	1.5	4.6	1.8
SUSD Emissions (per HRSG), lb/hr	0.19	0.81	0.19	0.81	0.19	0.81	0.19	0.81
Total SO_2 SUSD Emissions (both CTs/HRSG's), tn/yr	0.09	0.08	0.26	0.30	0.89	0.49	0.54	0.24

3.4 Greenhouse Gas Emissions

Natural gas has the lowest greenhouse gas (GHG) emission rate of all fossil fuels such as coal or fuel oil. In general, GHG emissions from a natural gas-fired power plant are less than 35% of those generated by an equivalent sized coal-fired power plant. Thus, the potential GHG footprint from the new SPC facility will be significantly smaller than that of other fossil-fuel fired energy plants of comparable size. Hence, the use of natural gas-firing by combustion turbines provides a significant benefit in reducing GHG emissions from power generation.

Maximum greenhouse gas emissions were determined for the CTs and HRSG's and are based SPC operating case #11 (-17°F/100% RH, 100% load with duct firing), high heating values (most conservative), and emission factors and global warming potentials as presented in the Climate Registry General Reporting Protocol, Version 1.1, May 2008.

For the auxiliary boiler and convection heaters, GHG emissions were determined based on emission factors provided in AP-42 Section 1.4, 40 CFR Part 98, and the Climate Registry. Table 3-8 shows the estimates for CO_2, CH_4, and N_2O and the total in terms of CO_2 equivalents in metric tons (MT). GHG emission estimates are presented in Appendix E. GHG emissions are not included for emergency equipment per 40 CFR Part 98.

Table 3-8

GHG Emissions and Total CO_2 Equivalents

GHG	Emissions (MT/yr)	Auxiliary Boiler (MT/yr)	Convection Heaters[1] (MT/yr)
CO_2	1926426	39735	20815
CH_4	32.60	0.76	0.40
N_2O	101.43	0.21	0.11
CO_2e	1958552.1	39816	20858

[1] Emissions for two convection heaters.

Greenhouse Gas Emissions for CT/HRSG
General Electric Combined Cycle Emission Estimates

Source: Sevier Power Company
Location: Sigurd, Utah
EPA Reference: Climate Registry General Reporting Protocol, Version 1.1 2008

Total Emissions CO_2e = CO_2 emissions (MT) X GWP + CH_4 emissions (MT) * GWP+ N_2O Emissions (MT) * GWP

	Global Warming Potential	Highest (MT)
CO_2	1	1926426
CH_4	21	32.60
N_2O	310	101.43

Total Emissions CO_2e = 1,958,552.1 MT

Assumptions:
Global Warming Potentials obtained from Climate Registry General Reporting Protocol, Version 1.1 2008
MT = Metric Tons
CO_2e based on SPC operating case #11

Greenhouse Gas Emissions for CT/HRSG
General Electric Combined Cycle Emission Estimates

Source: Sevier Power Company
Location: Sigurd, Utah
EPA Reference: Climate Registry General Reporting Protocol, Version 1.1 2008

			CO_2				N_2O				CH_4			
Case No.	Sevier Case No.	Total GT & HRSG Fuel Flow MMBtu/hr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr
GE Case # 1	1	3652.20	117	4.27E+05	1871606.4	1697883.9	0.006	22.50	98.54	89.39	0.002	7.2	31.7	28.7
GE Case # 2	NA	3494.10	117	4.09E+05	1790586.5	1624384.2	0.006	21.52	94.27	85.52	0.002	6.9	30.3	27.5
GE Case # 3	2	3349.40	117	3.92E+05	1716433.5	1557114.2	0.006	20.63	90.37	81.98	0.002	6.6	29.0	26.4
GE Case # 4	3a	2168.80	117	2.54E+05	1111423.2	1008260.9	0.006	13.36	58.52	53.08	0.002	4.3	18.8	17.1
GE Case # 5	3b	1741.10	117	2.04E+05	892244.1	809426.0	0.006	10.73	46.98	42.62	0.002	3.4	15.1	13.7
GE Case # 6	4	3838.20	117	4.49E+05	1966924.0	1784354.1	0.006	23.64	103.56	93.95	0.002	7.6	33.3	30.2
GE Case # 7	10	3737.70	117	4.37E+05	1915421.7	1737632.3	0.006	23.02	100.85	91.49	0.002	7.4	32.4	29.4
GE Case # 8	5	3563.50	117	4.17E+05	1826151.2	1656647.9	0.006	21.95	96.15	87.22	0.002	7.1	30.9	28.0
GE Case # 9	6a	2263.10	117	2.65E+05	1159748.2	1052100.4	0.006	13.94	61.06	55.39	0.002	4.5	19.6	17.8
GE Case # 10	6b	1899.90	117	2.22E+05	973622.8	883251.1	0.006	11.70	51.26	46.50	0.002	3.8	16.5	14.9
GE Case # 11	7	1781.70	117	2.08E+05	913050.0	828300.7	0.006	10.98	48.07	43.61	0.002	3.5	15.5	14.0
GE Case # 12	9a	1131.60	117	1.32E+05	579899.7	526073.4	0.006	6.97	30.53	27.70	0.002	2.2	9.8	8.9
GE Case # 13	9b	950.00	117	1.11E+05	486837.0	441648.8	0.006	5.85	25.63	23.25	0.002	1.9	8.2	7.5
GE Case # 14	11	4143.80	117	4.85E+05	2123531.7	1926425.5	0.006	25.53	111.80	101.43	0.002	8.2	35.9	32.6
GE Case # 15	12	3832.90	117	4.48E+05	1964207.9	1781890.2	0.006	23.61	103.41	93.82	0.002	7.6	33.2	30.2
GE Case # 16	13a	2604.50	117	3.05E+05	1334702.1	1210815.0	0.006	16.04	70.27	63.75	0.002	5.2	22.6	20.5
GE Case # 17	13b	2103.40	117	2.46E+05	1077908.4	977856.9	0.006	12.96	56.75	51.48	0.002	4.2	18.2	16.5
GE Case # 18	14	3511.50	117	4.11E+05	1799503.3	1632473.4	0.006	21.63	94.74	85.95	0.002	7.0	30.5	27.6
GE Case # 19	NA	3670.10	117	4.29E+05	1880779.4	1706205.5	0.006	22.61	99.02	89.83	0.002	7.3	31.8	28.9
GE Case # 20	NA	3704.00	117	4.33E+05	1898151.8	1721965.4	0.006	22.82	99.94	90.66	0.002	7.3	32.1	29.1

Notes:

1. Standard Conditions for scf are based on GE's standards, namely 68F & 14.6959 psi.
2. M = 1000 (i.e. Mlb/hr = 1000 lb/hr, MMscf/hr = 1,000,000 scf/hr).
3. Mlb/hr obtained from selected performance data for SPC spreadsheet.
4. CH_4 emissions based on vendor supplied data.

Comparison of Emission Factors:
Climate Registry default GHG Emission Factors: 53.06 kg CO2/MMBtu (117 lb CO2/MMBtu); 0.9 g CH4/MMBtu (0.00198 lb/MMBtu); 2.8 g N2O/MMBtu (0.00616 lb/MMBtu)
Mandatory GHG Reporting Rule Emission Factors: 53.02 kg CO2/MMBtu (117 lb CO2/MMBtu);1.0 e10-3 kg/CH4/MMBtu (0.002 lb/MMBtu); 1.0 E 10-4 kg N20/MMbtu (0.0002 lb/MMBtu)
AP-42 Section 3.1 Emission Factors: 110 lb CO2/MMBtu; 0.003 lb N2O/MMBtu

Greenhouse Gas Emissions for CT/HRSG
Combined Cycle Emission Estimates with Siemens CT's

Source: Sevier Power Company
Location: Sigurd, Utah
EPA Reference: Climate Registry General Reporting Protocol, Version 1.1 2008

Total Emissions CO_2e = CO_2 emissions (MT) X GWP + CH_4 emissions (MT) * GWP+ N_2O Emissions (MT) * GWP

	Global Warming Potential	Highest (MT)
CO_2	1	1872637
CH_4	21	31.69079
N_2O	310	98.59

Total Emissions CO_2e = 1,903,866.9 MT

Assumptions:
Global Warming Potentials obtained from Climate Registry General Reporting Protocol, Version 1.1 2008
MT = Metric Tons
Highest GHG emissions based on Siemens/SPC Case #4

Greenhouse Gas Emissions for CT/HRSG
Combined Cycle Emission Estimates with Siemens CT's

Source: Sevier Power Company
Location: Sigurd, Utah
EPA Reference: Climate Registry General Reporting Protocol, Version 1.1 2008

			CO_2				N_2O				CH_4			
Case No.	Sevier Case No.	Total GT & HRSG Fuel Flow MMBTU/hr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr	Emission Factor lb/MMBtu	lb/hr	tn/yr	Metric tn/yr
Siemens Case # 1	1	3719.30	117	4.35E+05	1905992.5	1729078.3	0.006	22.91	100.35	91.04	0.002	7.4	32.3	29.3
Siemens Case # 2	2	3188.70	117	3.73E+05	1634081.2	1482405.8	0.006	19.64	86.03	78.05	0.002	6.3	27.7	25.1
Siemens Case # 3	3	1934.80	117	2.26E+05	991507.6	899475.9	0.006	11.92	52.20	47.36	0.002	3.8	16.8	15.2
Siemens Case # 4	4	4028.10	117	4.71E+05	2064240.1	1872637.4	0.006	24.81	108.68	98.59	0.002	8.0	34.9	31.7
Siemens Case # 5	5	3494.90	117	4.09E+05	1790996.5	1624756.2	0.006	21.53	94.30	85.54	0.002	6.9	30.3	27.5
Siemens Case # 6	6	2212.00	117	2.59E+05	1133561.5	1028344.3	0.006	13.63	59.68	54.14	0.002	4.4	19.2	17.4
Siemens Case # 7	7	3498.60	117	4.09E+05	1792892.6	1626476.3	0.006	21.55	94.40	85.63	0.002	6.9	30.3	27.5
Siemens Case # 8	9	2212.00	117	2.59E+05	1133561.5	1028344.3	0.006	13.63	59.68	54.14	0.002	4.4	19.2	17.4
Siemens Case # 9	10	3548.10	117	4.15E+05	1818259.3	1649488.5	0.006	21.86	95.73	86.84	0.002	7.0	30.8	27.9
Siemens Case # 10	12	3986.40	117	4.66E+05	2042870.5	1853251.3	0.006	24.56	107.56	97.57	0.002	7.9	34.6	31.4
Siemens Case # 11	13	1246.70	117	1.46E+05	638883.9	579582.7	0.006	7.68	33.64	30.51	0.002	2.5	10.8	9.8
Siemens Case # 12	14	1721.10	117	2.01E+05	881994.9	800128.1	0.006	10.60	46.44	42.13	0.002	3.4	14.9	13.5

Notes:

M = 1000 (i.e. Mlb/hr = 1000 lb/hr, MMscf/hr = 1,000,000 scf/hr).
Mlb/hr obtained from selected performance data for SPC performance data spreadsheet for Siemens
Formaldehyde emissions assume 85% control through catalytic oxidation. (Ref: http://www.poweronsite.org/AppGuide/Emissions/Oxidation_Catalysts.htm)

Comparison of Emission Factors:
Climate Registry default GHG Emission Factors: 53.06 kg CO2/MMBtu (117 lb CO2/MMBtu); 0.9 g CH4/MMBtu (0.00198 lb/MMBtu); 2.8 g N2O/MMBtu (0.00616 lb/MMBtu)
Mandatory GHG Reporting Rule Emission Factors: 53.02 kg CO2/MMBtu (117 lb CO2/MMBtu);1.0 e10-3 kg/CH4/MMBtu (0.002 lb/MMBtu); 1.0 E 10-4 kg N20/MMbtu (0.0002 lb/MMBtu)
AP-42 Section 3.1 Emission Factors: 110 lb CO2/MMBtu; 0.003 lb N2O/MMBtu

1 HOUR EMISSIONS - GE

Operating Load Case	Duct Burner	Ambient Conditions	CT Load (%)	HRSG EXHAUST GAS EMISSIONS PER GT/HRSG (LB/HR) NOx	CO	VOC	PM10/PM2.5	SO2
Sevier Case # 1/GE Case # 1	Fired	104F/41% RH	2 x 100%	13	12	7	14	2.9
Sevier Case # 3a/GE Case # 4	Unfired	104F/41% RH	2 x 52%	8	7	4	11	1.8
Sevier Case # 3b/GE Case # 5	Unfired	104F/41% RH	2 x 36%	6	6	3	11	1.4
Sevier Case # 4/GE Case # 6	Fired	48F/61%RH	2 x 100%	14	13	7	14	3.1
Sevier Case # 5/GE Case # 8	Unfired	48F/61%RH	2 x 100%	13	12	7	12	2.9
Sevier Case # 6a/GE Case # 9	Unfired	48F/61%RH	2 x 49%	8	8	4	11	1.8
Sevier Case # 6b/GE Case # 10	Unfired	48F/61%RH	2 x 36%	7	6	4	11	1.6
Sevier Case # 10/GE Case # 7	Fired	48F/61%RH	2 x 100%	14	12	7	13	3.0
Sevier Case # 11/GE Case # 14	Fired	-17F/100%RH	2 x 100%	15	14	8	14	3.3
Sevier Case # 13a/GE Case # 16	Unfired	-17F/100%RH	2 x 56%	10	9	5	11	2.1
Sevier Case # 13b/GE Case # 17	Unfired	-17F/100%RH	2 x 39%	8	7	4	11	1.7
Sevier Case # 14/GE Case # 18	Unfired	65F/51%RH	2 x 100%	13	12	7	12	2.8
Sevier Case N/A/GE Case # 2	Fired	104F/41% RH	2 x 100%	13	12	7	14	2.8

COMBINDED STARTUP/SHUTDOWN EMISSIONS FOR BOTH GT's/HRSG's

Event	Qty	Duration per Event (hours)	Total Event Time (hours)	NOx Emission per event (lbs)	NOx Emission All Events (tons/yr)	CO Emission per event (lbs)	CO Emissions All Events (tons/yr)	VOC Emission per event (lbs)	VOC Emission All Events (tons/yr)	PM10/PM2.5 Emission per event (lbs)	PM10/PM2.5 Emission All Events (tons/yr)	SO2 Emission per event (lbs)	SO2 Emission All Events (tons/yr)
Cold Starts	0	4.03	0.00	951	0.00	3628	0.00	265	0.00	87	0.00	15	0.00
Warm Starts	1	2.23	2.23	391	0.20	1221	0.61	62	0.03	43	0.02	10	0.01
Hot Starts	0	1.45	0.00	213	0.00	765	0.00	47	0.00	24	0.00	8	0.00
Shutdown	1	0.40	0.40	46	0.02	581	0.29	18	0.01	11	0.01	4	0.00
			2.63		0.22		0.90		0.04		0.03		0.01
Downtime			0.00										

COMBINED 1 HOUR EMISSIONS FOR BOTH GT's/HRSG's (Operation + SU/SD Events)

Operating Load Case	Duct Burner	Ambient Conditions	CT Load (%)	HRSG Exhaust NOx Emission (lb/hr)	Total NOx (t/yr)	HRSG Exhaust CO Emission (lb/hr)	Total CO (t/yr)	HRSG Exhaust VOC Emission (lb/hr)	Total VOC (t/yr)	HRSG Exhaust PM10/PM2.5 Emission (lb/hr)	Total PM10/PM2.5 (t/yr)	HRSG Exhaust SO2 Emission (lb/hr)	Total SO2 (t/yr)
Sevier Case # 1/GE Case # 1	Fired	104F/41% RH	2 x 100%	13	0.22	12	0.90	7	0.04	14	0.03	2.9	0.01
Sevier Case # 3a/GE Case # 4	Unfired	104F/41% RH	2 x 52%	8	0.22	7	0.90	4	0.04	11	0.03	1.8	0.01
Sevier Case # 3b/GE Case # 5	Unfired	104F/41% RH	2 x 36%	6	0.22	6	0.90	3	0.04	11	0.03	1.4	0.01
Sevier Case # 4/GE Case # 6	Fired	48F/61%RH	2 x 100%	14	0.22	13	0.90	7	0.04	14	0.03	3.1	0.01
Sevier Case # 5/GE Case # 8	Unfired	48F/61%RH	2 x 100%	13	0.22	12	0.90	7	0.04	12	0.03	2.9	0.01
Sevier Case # 6a/GE Case # 9	Unfired	48F/61%RH	2 x 49%	8	0.22	8	0.90	4	0.04	11	0.03	1.8	0.01
Sevier Case # 6b/GE Case # 10	Unfired	48F/61%RH	2 x 36%	7	0.22	6	0.90	4	0.04	11	0.03	1.6	0.01
Sevier Case # 10/GE Case # 7	Fired	48F/61%RH	2 x 100%	14	0.22	12	0.90	7	0.04	13	0.03	3	0.01
Sevier Case # 11/GE Case # 14	Fired	-17F/100%RH	2 x 100%	15	0.22	14	0.90	8	0.04	14	0.03	3.3	0.01
Sevier Case # 13a/GE Case # 16	Unfired	-17F/100%RH	2 x 56%	10	0.22	9	0.90	5	0.04	11	0.03	2.1	0.01
Sevier Case # 13b/GE Case # 17	Unfired	-17F/100%RH	2 x 39%	8	0.22	7	0.90	4	0.04	11	0.03	1.7	0.01
Sevier Case # 14/GE Case # 18	Unfired	65F/51%RH	2 x 100%	13	0.22	12	0.90	7	0.04	12	0.03	2.8	0.01
Sevier Case N/A/GE Case # 2	Fired	104F/41% RH	2 x 100%	13	0.22	12	0.90	7	0.04	14	0.03	2.8	0.01

ANNUAL EMISSIONS - GE

Assumed Hours of Duct Burner Firing:	5,000
Assumed Hours of Non-Duct Burner Firing:	3,760
	8,760

Annual Emissions Based on GE Cases 6 & 8

HRSG EXHAUST GAS EMISSIONS PER GT/HRSG (LB/HR)

Operating Load Case	NOx	CO	VOC	PM10/PM2.5	SO2	SO3
Sevier Case # 4/GE Case # 6 (fired)	14	13	7	14	3.1	2.3
Sevier Case # 5/GE Case # 8 (unfired)	13	12	7	12	2.9	2.1
Weighted Average (lb/hr)	13.6	12.6	7.0	13.1	3.0	2.2

COMBINDED STARTUP/SHUTDOWN EMISSIONS FOR BOTH GT's/HRSG's

Event	Qty	Duration per Event (hours)	Total Event Time (hours)	NOx Emission per event (lbs)	NOx Emission All Events (tons/yr)	CO Emission per event (lbs)	CO Emissions All Events (tons/yr)	VOC Emission per event (lbs)	VOC Emission All Events (tons/yr)	PM10/PM2.5 Emission per event (lbs)	PM10/PM2.5 Emission All Events (tons/yr)	SO2 Emission per event (lbs)	SO2 Emission All Events (tons/yr)	SO3 Emission per event (lbs)	SO3 Emission All Events (tons/yr)
Cold Starts	12	4.03	48.40	951	5.71	3628	21.77	265	1.59	87	0.52	15	0.09	2	0.01
Warm Starts	50	2.23	111.67	391	9.78	1221	30.53	62	1.55	43	1.08	10	0.26	2	0.05
Hot Starts	230	1.45	333.50	213	24.44	765	87.93	47	5.45	24	2.73	8	0.89	1	0.17
Shutdown	292	0.40	116.80	46	6.76	581	84.78	18	2.62	11	1.55	4	0.54	1	0.09
			610.37		46.68		225.01		11.21		5.89		1.78		0.32
Downtime			976.00												

ANNUAL EMISSIONS

	NOx	CO	VOC	PM10/PM2.5	SO2	SO3
Total GT/HRSG Annual Emissions (t/yr)	144.03	315.19	61.43	100.16	23.41	16.20
Avg. Annual Emissions per GT/HRSG (t/yr)	72.02	157.59	30.71	50.08	11.70	8.10

Notes:

1. Annual emissions based on using load cases for annual average ambient temperature, fired & unfired

1 HOUR EMISSIONS - Siemens

HRSG EXHAUST GAS EMISSIONS PER GT/HRSG (LB/HR)

Operating Load Case	Duct Burner	Ambient Conditions	CT Load (%)	NOx	CO	VOC	PM10/PM2.5	SO2
Sevier Case # 1/Siemens Case # 1	Fired	104F/41% RH	2 x 100%	14	9	5	11	3.2
Sevier Case # 2/Siemens Case # 2	Unfired	104F/41% RH	2 x 100%	12	7	2	8	2.7
Sevier Case # 3/Siemens Case # 3	Unfired	104F/41% RH	2 x 50%	7	5	2	8	1.7
Sevier Case # 4/Siemens Case # 4	Fired	48F/61%RH	2 x 100%	15	9	5	12	3.4
Sevier Case # 5/Siemens Case # 5	Unfired	48F/61%RH	2 x 100%	13	8	2	9	3.0
Sevier Case # 6/Siemens Case # 6	Unfired	48F/61%RH	2 x 50%	8	5	2	8	1.9
Sevier Case # 7/Siemens Case # 7	Unfired	48F/61%RH	1 x 100%	13	8	2	9	3.0
Sevier Case # 9/Siemens Case # 8	Unfired	48F/61%RH	1 x 50%	8	5	2	8	1.9
Sevier Case # 10/Siemens Case # 9	Fired	48F/61%RH	2 x 100%	13	8	2	9	3.0
Sevier Case # 12/Siemens Case # 10	Unfired	-17F/100%RH	2 x 100%	15	9	3	10	3.4
Sevier Case # 13/Siemens Case # 11	Unfired	-17F/100%RH	2 x 50%	10	6	2	8	2.1
Sevier Case # 14/Siemens Case # 12	Unfired	65F/51%RH	2 x 100%	13	8	2	9	2.9

COMBINDED STARTUP/SHUTDOWN EMISSIONS FOR BOTH GT's/HRSG's

Event	Qty	Duration per Event (hours)	Total Event Time (hours)	NOx Emission per event (lbs)	NOx Emission All Events (tons/yr)	CO Emission per event (lbs)	CO Emissions All Events (tons/yr)	VOC Emission per event (lbs)	VOC Emission All Events (tons/yr)	PM10/PM2.5 Emission per event (lbs)	PM10/PM2.5 Emission All Events (tons/yr)	SO2 Emission per event (lbs)	SO2 Emission All Events (tons/yr)
Cold Starts	0	4.17	0.00	876	0.00	7990	0.00	913	0.00	71	0.00	13	0.00
Warm Starts	1	2.08	2.08	388	0.19	3800	1.90	410	0.21	37	0.02	12	0.01
Hot Starts	0	1.45	0.00	196	0.00	2089	0.00	267	0.00	23	0.00	4	0.00
Shutdown	1	0.45	0.45	69	0.03	704	0.35	87	0.04	8	0.00	2	0.00
			2.53		0.23		2.25		0.25		0.02		0.01
Downtime			0.00										

COMBINED 1 HOUR EMISSIONS FOR BOTH GT's/HRSG's (Operation + SU/SD Events)

Operating Load Case	Duct Burner	Ambient Conditions	CT Load (%)	HRSG Exhaust NOx Emission (lb/hr)	Total NOx (t/yr)	HRSG Exhaust CO Emission (lb/hr)	Total CO (t/yr)	HRSG Exhaust VOC Emission (lb/hr)	Total VOC (t/yr)	HRSG Exhaust PM10/PM2.5 Emission (lb/hr)	Total PM10/PM2.5 (t/yr)	HRSG Exhaust SO2 Emission (lb/hr)	Total SO2 (t/yr)
Sevier Case # 1/Siemens Case # 1	Fired	104F/41% RH	2 x 100%	14	0.23	9	2.25	5	0.25	11	0.02	3.2	0.01
Sevier Case # 2/Siemens Case # 2	Unfired	104F/41% RH	2 x 100%	12	0.23	7	2.25	2	0.25	8	0.02	2.7	0.01
Sevier Case # 3/Siemens Case # 3	Unfired	104F/41% RH	2 x 50%	7	0.23	5	2.25	2	0.25	8	0.02	1.7	0.01
Sevier Case # 4/Siemens Case # 4	Fired	48F/61%RH	2 x 100%	15	0.23	9	2.25	5	0.25	12	0.02	3.4	0.01
Sevier Case # 5/Siemens Case # 5	Unfired	48F/61%RH	2 x 100%	13	0.23	8	2.25	2	0.25	9	0.02	3	0.01
Sevier Case # 6/Siemens Case # 6	Unfired	48F/61%RH	2 x 50%	8	0.23	5	2.25	2	0.25	8	0.02	1.9	0.01
Sevier Case # 7/Siemens Case # 7	Unfired	48F/61%RH	1 x 100%	13	0.23	8	2.25	2	0.25	9	0.02	3	0.01
Sevier Case # 9/Siemens Case # 8	Unfired	48F/61%RH	1 x 50%	8	0.23	5	2.25	2	0.25	8	0.02	1.9	0.01
Sevier Case # 10/Siemens Case # 9	Fired	48F/61%RH	2 x 100%	13	0.23	8	2.25	2	0.25	9	0.02	3	0.01
Sevier Case # 12/Siemens Case # 10	Unfired	-17F/100%RH	2 x 100%	15	0.23	9	2.25	3	0.25	10	0.02	3.4	0.01
Sevier Case # 13/Siemens Case # 11	Unfired	-17F/100%RH	2 x 50%	10	0.23	6	2.25	2	0.25	8	0.02	2.1	0.01
Sevier Case # 14/Siemens Case # 12	Unfired	65F/51%RH	2 x 100%	13	0.23	8	2.25	2	0.25	9	0.02	2.9	0.01

ANNUAL EMISSIONS - Siemens

Assumed Hours of Duct Burner Firing:	5,000
Assumed Hours of Non-Duct Burner Firing:	3,760
	8,760

Annual Emissions Based on Siemens Cases 4 & 5

HRSG EXHAUST GAS EMISSIONS PER GT/HRSG (LB/HR)

Operating Load Case	NOx	CO	VOC	PM10/PM2.5	SO2	SO3
Sevier Case # 4/Siemens Case # 4 (fired)	15	9	5	12	3.4	0.85
Sevier Case # 5/Siemens Case # 5 (unfired)	13	8	2	9	3	0.75
Weighted Average (lb/hr)	14.1	8.7	4.0	10.7	3.2	0.8

COMBINDED STARTUP/SHUTDOWN EMISSIONS FOR BOTH GT's/HRSG's

Event	Qty	Duration per Event (hours)	Total Event Time (hours)	NOx Emission per event (lbs)	NOx Emission All Events (tons/yr)	CO Emission per event (lbs)	CO Emissions All Events (tons/yr)	VOC Emission per event (lbs)	VOC Emission All Events (tons/yr)	PM10/PM2.5 Emission per event (lbs)	PM10/PM2.5 Emission All Events (tons/yr)	SO2 Emission per event (lbs)	SO2 Emission All Events (tons/yr)	SO3 Emission per event (lbs)	SO3 Emission All Events (tons/yr)
Cold Starts	12	4.17	50.00	876	5.25	7990	47.94	913	5.48	71	0.43	13	0.08	3	0.02
Warm Starts	50	2.08	104.17	388	9.70	3800	95.00	410	10.26	37	0.93	12	0.30	2	0.04
Hot Starts	230	1.45	333.50	196	22.59	2089	240.23	267	30.75	23	2.63	4	0.49	1	0.13
Shutdown	292	0.45	131.40	69	10.10	704	102.77	87	12.70	8	1.17	2	0.24	1	0.16
			619.07		47.64		485.93		59.19		5.16		1.11		0.36
Downtime			976.00												

ANNUAL EMISSIONS

	NOx	CO	VOC	PM10/PM2.5	SO2	SO3
Total GT/HRSG Annual Emissions (t/yr)	148.96	548.16	87.94	81.91	24.24	6.14
Avg. Annual Emissions per GT/HRSG (t/yr)	74.48	274.08	43.97	40.96	12.12	3.07

Notes:

1. Annual emissions based on using load cases for annual average ambient temperature, fired & unfired

PROPOSED STARTUP & SHUTDOWN SCHEDULE - GE

Averaging Period	Number of Starts			Non-Operating Hours Before Startup (Downtime)		
	Cold	Warm	Hot	Cold	Warm	Hot
1 Hour	0	1	0	0	0	0
3 Hour	1	0	0	0	0	0
8 Hour	1	0	4	0	0	0
24 Hour	1	0	20	0	0	0
Annual	12	50	230	48	8	0

Combined Emissions During Startup or Shutdown for Both GT's/HRSG's (lb/hr)

Start Type	NOx	CO	VOC	PM10/PM2.5	SO2	SO3	Duration (Minutes)	Duration (Hours)
Cold	235.9	899.4	65.8	21.5	3.8	0.5	242.0	4.03
Warm	175.1	546.8	27.8	19.4	4.7	0.9	134.0	2.23
Hot	146.6	527.3	32.7	16.4	5.3	1.0	87.0	1.45
Shutdown	115.7	1451.7	44.9	26.5	9.3	1.5	24.0	0.40

Average Emissions During Startup or Shutdown per GT/HRSG (lb/hr)

Start Type	NOx	CO	VOC	PM10/PM2.5	SO2	SO3	Duration (Minutes)	Duration (Hours)
Cold	117.9	449.7	32.9	10.8	1.9	0.3	242.0	4.03
Warm	87.5	273.4	13.9	9.7	2.3	0.4	134.0	2.23
Hot	73.3	263.7	16.3	8.2	2.7	0.5	87.0	1.45
Shutdown	57.9	725.9	22.4	13.2	4.6	0.7	24.0	0.40

Meteorological Solutions Inc.

Attachment B
Startup/Shutdown Dispersion Modeling Results

4525 Wasatch Blvd. | Suite 200 | SLC, UT 84124
Phone: 801-272-3000 | Fax: 801-272-3040
www.metsolution.com | info@metsolution.com

**MODELOPTs: RegDFAULT CONC ELEV

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 2 Short Term Average(s) of: 1-HR 8-HR

**This Run Includes: 3 Source(s); 2 Source Group(s); and 6824 Receptor(s)

**The Model Assumes A Pollutant Type of: CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1601.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 5.0 MB of RAM.

**Input Runstream File: SPC_GE_SUSD_FI_2yrs_CO.DTA
**Output Print File: SPC_GE_SUSD_FI_2yrs_CO.LST

**File for Summary of Results: C:\beast\SPC\SUSDModeling\SPC_GE_SUSD_FI_2yrs_CO.SUM

**MODELOPTs: RegDFAULT CONC ELEV

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
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NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SPC02.SFC Met Version: 11059
Profile file: SPC02.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 72572 Upper air station no.: 24127
Name: UNKNOWN Name: SALT_LAKE_CITY,UT
Year: 2001 Year: 2001

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
01	08	06	218	01	-29.3	0.330	-9.000	-9.000	-999.	436.	95.4	0.11	0.74	1.00	3.60	132.	6.1	295.4	2.0
01	08	06	218	02	-24.4	0.275	-9.000	-9.000	-999.	334.	66.5	0.11	0.74	1.00	3.10	125.	6.1	295.4	2.0
01	08	06	218	03	-13.6	0.145	-9.000	-9.000	-999.	136.	17.3	0.11	0.74	1.00	2.10	188.	6.1	292.0	2.0
01	08	06	218	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.11	0.74	1.00	0.00	0.	6.1	293.1	2.0
01	08	06	218	05	-4.7	0.074	-9.000	-9.000	-999.	46.	6.7	0.11	0.74	1.00	1.50	124.	6.1	291.4	2.0
01	08	06	218	06	-16.2	0.227	-9.000	-9.000	-999.	248.	56.1	0.11	0.74	1.00	2.60	156.	6.1	290.9	2.0
01	08	06	218	07	9.4	0.361	0.246	0.005	49.	499.	-390.0	0.11	0.74	0.40	3.60	143.	6.1	295.4	2.0
01	08	06	218	08	53.8	0.332	0.587	0.007	117.	441.	-53.1	0.11	0.74	0.25	3.10	136.	6.1	297.0	2.0
01	08	06	218	09	97.6	0.343	0.891	0.006	226.	462.	-32.3	0.11	0.74	0.20	3.10	163.	6.1	300.4	2.0
01	08	06	218	10	134.5	0.261	1.103	0.014	310.	309.	-10.3	0.11	0.74	0.19	2.10	224.	6.1	303.1	2.0
01	08	06	218	11	163.0	0.266	1.272	0.009	396.	315.	-9.0	0.11	0.74	0.18	2.10	302.	6.1	305.9	2.0
01	08	06	218	12	179.5	0.213	1.426	0.005	503.	227.	-4.2	0.11	0.74	0.18	1.50	296.	6.1	305.9	2.0
01	08	06	218	13	187.0	0.359	1.561	0.005	633.	496.	-19.3	0.11	0.74	0.18	3.10	216.	6.1	308.1	2.0
01	08	06	218	14	182.6	0.448	1.930	0.005	1226.	690.	-38.3	0.11	0.74	0.18	4.10	312.	6.1	308.1	2.0
01	08	06	218	15	167.5	0.356	1.917	0.005	1310.	494.	-21.0	0.11	0.74	0.18	3.10	296.	6.1	308.1	2.0
01	08	06	218	16	141.4	0.262	1.842	0.005	1375.	313.	-9.9	0.11	0.74	0.19	2.10	300.	6.1	307.0	2.0
01	08	06	218	17	107.2	0.390	1.916	0.005	2051.	561.	-43.3	0.11	0.74	0.20	3.60	5.	6.1	307.0	2.0
01	08	06	218	18	96.8	0.412	2.015	0.005	2557.	609.	-54.6	0.06	0.74	0.24	4.90	208.	10.0	299.8	2.0
01	08	06	218	19	21.9	0.267	1.362	0.005	3487.	329.	-65.4	0.06	0.74	0.37	3.20	186.	10.0	298.2	2.0
01	08	06	218	20	-7.3	0.093	-9.000	-9.000	-999.	100.	8.4	0.06	0.74	0.75	2.40	229.	10.0	295.4	2.0
01	08	06	218	21	-3.1	0.066	-9.000	-9.000	-999.	39.	6.8	0.06	0.74	1.00	1.70	204.	10.0	293.5	2.0
01	08	06	218	22	-1.6	0.047	-9.000	-9.000	-999.	23.	4.8	0.06	0.74	1.00	1.20	224.	10.0	292.4	2.0
01	08	06	218	23	-2.4	0.057	-9.000	-9.000	-999.	31.	5.7	0.05	0.74	1.00	1.50	326.	10.0	291.1	2.0
01	08	06	218	24	-1.1	0.039	-9.000	-9.000	-999.	18.	4.0	0.06	0.74	1.00	1.00	38.	10.0	290.1	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
01	08	06	01	6.1	1	132.	3.60	295.4	-999.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
SPC	HIGH	1ST HIGH VALUE IS	1429.51760	ON 01122302:	AT (411200.00, 4301600.00, 1734.38, 2753.55, 0.00)	DC
ALL	HIGH	1ST HIGH VALUE IS	1429.51760	ON 01122302:	AT (411200.00, 4301600.00, 1734.38, 2753.55, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
SPC	HIGH	1ST HIGH VALUE IS	191.76799	ON 02051808:	AT (415500.00, 4307000.00, 1739.39, 2753.55, 0.00)	DC
ALL	HIGH	1ST HIGH VALUE IS	191.76799	ON 02051808:	AT (415500.00, 4307000.00, 1739.39, 2753.55, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 151 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 5 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
CN W305 17 WAKFLG:Stack height > or = EPA formula height for SRCID: STK2
CN W305 38 WAKFLG:Stack height > or = EPA formula height for SRCID: AUX

```
**MODELOPTs:  NonDFAULT CONC                                    ELEV
                                                                        PVMRM

                              ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  -- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.750
           and with a Default In-stack Ratio of  0.210

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     18 Source(s);       6 Source Group(s); and     6824 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1601.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                               ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      17.4 MB of RAM.

**Input Runstream File:          SPC_GE_SUSD_FI_PVMRM_2yrs_NO2.DTA
**Output Print File:             SPC_GE_SUSD_FI_PVMRM_2yrs_NO2.LST

**File for Summary of Results:   C:\beast\SPC\SUSDModeling\SPC_GE_SUSD_FI_PVMRM_2yrs_NO2.SUM
```



```
**MODELOPTs:  NonDFAULT CONC                                    ELEV
                                                                        PVMRM

                            *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                            (1=YES; 0=NO)

         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
         1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

           NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                      *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                           (METERS/SEC)

                                 1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SPC02.SFC Met Version: 11059
Profile file: SPC02.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 72572 Upper air station no.: 24127
Name: UNKNOWN Name: SALT_LAKE_CITY,UT
Year: 2001 Year: 2001

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
01	08	06	218	01	-29.3	0.330	-9.000	-9.000	-999.	436.	95.4	0.11	0.74	1.00	3.60	132.	6.1	295.4	2.0
01	08	06	218	02	-24.4	0.275	-9.000	-9.000	-999.	334.	66.5	0.11	0.74	1.00	3.10	125.	6.1	295.4	2.0
01	08	06	218	03	-13.6	0.145	-9.000	-9.000	-999.	136.	17.3	0.11	0.74	1.00	2.10	188.	6.1	292.0	2.0
01	08	06	218	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.11	0.74	1.00	0.00	0.	6.1	293.1	2.0
01	08	06	218	05	-4.7	0.074	-9.000	-9.000	-999.	46.	6.7	0.11	0.74	1.00	1.50	124.	6.1	291.4	2.0
01	08	06	218	06	-16.2	0.227	-9.000	-9.000	-999.	248.	56.1	0.11	0.74	1.00	2.60	156.	6.1	290.9	2.0
01	08	06	218	07	9.4	0.361	0.246	0.005	49.	499.	-390.0	0.11	0.74	0.40	3.60	143.	6.1	295.4	2.0
01	08	06	218	08	53.8	0.332	0.587	0.007	117.	441.	-53.1	0.11	0.74	0.25	3.10	136.	6.1	297.0	2.0
01	08	06	218	09	97.6	0.343	0.891	0.006	226.	462.	-32.3	0.11	0.74	0.20	3.10	163.	6.1	300.4	2.0
01	08	06	218	10	134.5	0.261	1.103	0.014	310.	309.	-10.3	0.11	0.74	0.19	2.10	224.	6.1	303.1	2.0
01	08	06	218	11	163.0	0.266	1.272	0.009	396.	315.	-9.0	0.11	0.74	0.18	2.10	302.	6.1	305.9	2.0
01	08	06	218	12	179.5	0.213	1.426	0.005	503.	227.	-4.2	0.11	0.74	0.18	1.50	296.	6.1	305.9	2.0
01	08	06	218	13	187.0	0.359	1.561	0.005	633.	496.	-19.3	0.11	0.74	0.18	3.10	216.	6.1	308.1	2.0
01	08	06	218	14	182.6	0.448	1.930	0.005	1226.	690.	-38.3	0.11	0.74	0.18	4.10	312.	6.1	308.1	2.0
01	08	06	218	15	167.5	0.356	1.917	0.005	1310.	494.	-21.0	0.11	0.74	0.18	3.10	296.	6.1	308.1	2.0
01	08	06	218	16	141.4	0.262	1.842	0.005	1375.	313.	-9.9	0.11	0.74	0.19	2.10	300.	6.1	307.0	2.0
01	08	06	218	17	107.2	0.390	1.916	0.005	2051.	561.	-43.3	0.11	0.74	0.20	3.60	5.	6.1	307.0	2.0
01	08	06	218	18	96.8	0.412	2.015	0.005	2557.	609.	-54.6	0.06	0.74	0.24	4.90	208.	10.0	299.8	2.0
01	08	06	218	19	21.9	0.267	1.362	0.005	3487.	329.	-65.4	0.06	0.74	0.37	3.20	186.	10.0	298.2	2.0
01	08	06	218	20	-7.3	0.093	-9.000	-9.000	-999.	100.	8.4	0.06	0.74	0.75	2.40	229.	10.0	295.4	2.0
01	08	06	218	21	-3.1	0.066	-9.000	-9.000	-999.	39.	6.8	0.06	0.74	1.00	1.70	204.	10.0	293.5	2.0
01	08	06	218	22	-1.6	0.047	-9.000	-9.000	-999.	23.	4.8	0.06	0.74	1.00	1.20	224.	10.0	292.4	2.0
01	08	06	218	23	-2.4	0.057	-9.000	-9.000	-999.	31.	5.7	0.05	0.74	1.00	1.50	326.	10.0	291.1	2.0
01	08	06	218	24	-1.1	0.039	-9.000	-9.000	-999.	18.	4.0	0.06	0.74	1.00	1.00	38.	10.0	290.1	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
01	08	06	01	6.1	1	132.	3.60	295.4	-999.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SPC	1ST HIGHEST VALUE IS	114.16284 AT	(412200.00, 4304200.00, 1791.61, 2753.55, 0.00)	DC	
	2ND HIGHEST VALUE IS	112.97012 AT	(413400.00, 4305000.00, 1785.81, 2753.55, 0.00)	DC	
	3RD HIGHEST VALUE IS	112.44982 AT	(413600.00, 4305200.00, 1785.08, 2753.55, 0.00)	DC	
	4TH HIGHEST VALUE IS	111.83256 AT	(411400.00, 4302000.00, 1771.24, 2753.55, 0.00)	DC	
	5TH HIGHEST VALUE IS	111.06414 AT	(412600.00, 4304200.00, 1786.98, 2753.55, 0.00)	DC	
	6TH HIGHEST VALUE IS	108.07787 AT	(412400.00, 4304200.00, 1803.76, 2753.55, 0.00)	DC	
	7TH HIGHEST VALUE IS	107.08034 AT	(413000.00, 4304800.00, 1788.59, 2753.55, 0.00)	DC	
	8TH HIGHEST VALUE IS	106.84572 AT	(412200.00, 4303600.00, 1809.02, 2753.55, 0.00)	DC	
	9TH HIGHEST VALUE IS	106.75334 AT	(413400.00, 4305200.00, 1809.42, 2753.55, 0.00)	DC	
	10TH HIGHEST VALUE IS	106.06621 AT	(411000.00, 4301800.00, 1788.62, 2753.55, 0.00)	DC	
REDMOND	1ST HIGHEST VALUE IS	3.93449 AT	(422000.00, 4315000.00, 1587.09, 1587.09, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.41223 AT	(428000.00, 4315000.00, 1595.94, 2004.84, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.14852 AT	(422500.00, 4307500.00, 1589.09, 2027.27, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.12732 AT	(423000.00, 4308500.00, 1592.00, 1657.47, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.01368 AT	(418500.00, 4308000.00, 1590.11, 2636.83, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.00101 AT	(423500.00, 4309500.00, 1589.69, 1657.47, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.73661 AT	(421000.00, 4312000.00, 1592.86, 1597.99, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.69579 AT	(419000.00, 4309000.00, 1591.80, 1998.17, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.60371 AT	(418500.00, 4307500.00, 1587.18, 2636.83, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.53967 AT	(417800.00, 4303600.00, 1588.74, 1870.97, 0.00)	DC	

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WESTCLAY  1ST HIGHEST VALUE IS      31.22501 AT (  418500.00,  4308500.00,  1597.36,  2636.83,     0.00)  DC
          2ND HIGHEST VALUE IS      27.65032 AT (  419000.00,  4309000.00,  1591.80,  1998.17,     0.00)  DC
          3RD HIGHEST VALUE IS      23.73005 AT (  417800.00,  4306000.00,  1598.59,  2636.83,     0.00)  DC
          4TH HIGHEST VALUE IS      22.68368 AT (  419000.00,  4309500.00,  1596.11,  1998.17,     0.00)  DC
          5TH HIGHEST VALUE IS      22.22383 AT (  417800.00,  4305800.00,  1597.21,  2636.83,     0.00)  DC
          6TH HIGHEST VALUE IS      20.97483 AT (  418000.00,  4307000.00,  1593.01,  2636.83,     0.00)  DC
          7TH HIGHEST VALUE IS      20.49674 AT (  419000.00,  4310000.00,  1603.52,  1985.22,     0.00)  DC
          8TH HIGHEST VALUE IS      20.43713 AT (  417800.00,  4305600.00,  1596.00,  2636.83,     0.00)  DC
          9TH HIGHEST VALUE IS      20.31452 AT (  418500.00,  4309000.00,  1604.83,  1998.17,     0.00)  DC
         10TH HIGHEST VALUE IS      19.68845 AT (  419500.00,  4310000.00,  1594.19,  1594.19,     0.00)  DC

USGYPSUM  1ST HIGHEST VALUE IS      56.15580 AT (  416600.00,  4299000.00,  1612.02,  1957.55,     0.00)  DC
          2ND HIGHEST VALUE IS      28.52176 AT (  417600.00,  4300000.00,  1613.33,  1870.97,     0.00)  DC
          3RD HIGHEST VALUE IS      28.18744 AT (  417600.00,  4300200.00,  1612.65,  1870.97,     0.00)  DC
          4TH HIGHEST VALUE IS      26.62529 AT (  417400.00,  4300000.00,  1610.94,  1870.97,     0.00)  DC
          5TH HIGHEST VALUE IS      25.11121 AT (  417400.00,  4299800.00,  1610.61,  1870.97,     0.00)  DC
          6TH HIGHEST VALUE IS      24.53431 AT (  416800.00,  4299000.00,  1617.94,  1796.24,     0.00)  DC
          7TH HIGHEST VALUE IS      23.39885 AT (  417800.00,  4300400.00,  1614.65,  1994.37,     0.00)  DC
          8TH HIGHEST VALUE IS      23.33115 AT (  416800.00,  4298800.00,  1618.22,  1958.42,     0.00)  DC
          9TH HIGHEST VALUE IS      21.80920 AT (  417000.00,  4299200.00,  1620.65,  1762.52,     0.00)  DC
         10TH HIGHEST VALUE IS      21.57121 AT (  417800.00,  4300600.00,  1614.39,  1994.37,     0.00)  DC
```


*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

```
                                                                                                  NETWORK
GROUP ID                    AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GPACIFIC  1ST HIGHEST VALUE IS     134.99471 AT (  416800.00,  4298600.00,  1638.59,  1958.42,     0.00)  DC
          2ND HIGHEST VALUE IS     130.78082 AT (  417000.00,  4299000.00,  1635.82,  1762.52,     0.00)  DC
          3RD HIGHEST VALUE IS     101.08670 AT (  417200.00,  4299400.00,  1634.76,  1762.52,     0.00)  DC
          4TH HIGHEST VALUE IS      97.78376 AT (  416800.00,  4299200.00,  1627.68,  1762.52,     0.00)  DC
          5TH HIGHEST VALUE IS      95.96830 AT (  416600.00,  4298200.00,  1632.35,  1958.42,     0.00)  DC
          6TH HIGHEST VALUE IS      89.88752 AT (  417400.00,  4299600.00,  1634.42,  1762.52,     0.00)  DC
          7TH HIGHEST VALUE IS      88.07121 AT (  417600.00,  4299600.00,  1634.38,  1763.60,     0.00)  DC
          8TH HIGHEST VALUE IS      84.60525 AT (  417800.00,  4299600.00,  1633.68,  2307.43,     0.00)  DC
          9TH HIGHEST VALUE IS      82.83085 AT (  417200.00,  4298000.00,  1633.55,  2335.67,     0.00)  DC
         10TH HIGHEST VALUE IS      78.50543 AT (  417000.00,  4298000.00,  1639.14,  2313.94,     0.00)  DC

ALL       1ST HIGHEST VALUE IS     135.02199 AT (  416800.00,  4298600.00,  1638.59,  1958.42,     0.00)  DC
          2ND HIGHEST VALUE IS     130.79848 AT (  417000.00,  4299000.00,  1635.82,  1762.52,     0.00)  DC
          3RD HIGHEST VALUE IS     114.16284 AT (  412200.00,  4304200.00,  1791.61,  2753.55,     0.00)  DC
          4TH HIGHEST VALUE IS     112.97012 AT (  413400.00,  4305000.00,  1785.81,  2753.55,     0.00)  DC
          5TH HIGHEST VALUE IS     112.44982 AT (  413600.00,  4305200.00,  1785.08,  2753.55,     0.00)  DC
          6TH HIGHEST VALUE IS     111.83256 AT (  411400.00,  4302000.00,  1771.24,  2753.55,     0.00)  DC
          7TH HIGHEST VALUE IS     111.06414 AT (  412600.00,  4304200.00,  1786.98,  2753.55,     0.00)  DC
          8TH HIGHEST VALUE IS     108.07787 AT (  412400.00,  4304200.00,  1803.76,  2753.55,     0.00)  DC
          9TH HIGHEST VALUE IS     107.08034 AT (  413000.00,  4304800.00,  1788.59,  2753.55,     0.00)  DC
         10TH HIGHEST VALUE IS     106.84572 AT (  412200.00,  4303600.00,  1809.02,  2753.55,     0.00)  DC
```

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

```
A Total of            0 Fatal Error Message(s)
A Total of            4 Warning Message(s)
A Total of          151 Informational Message(s)

A Total of         8784 Hours Were Processed

A Total of            5 Calm Hours Identified

A Total of          146 Missing Hours Identified (  1.66 Percent)
```

******** FATAL ERROR MESSAGES ********
*** NONE ***

```
******** WARNING MESSAGES ********
SO W320     319  PPARM:Input Parameter May Be Out-of-Range for Parameter          DS
CN W305      17 WAKFLG:Stack height > or = EPA formula height for SRCID:         STK2
CN W305      38 WAKFLG:Stack height > or = EPA formula height for SRCID:          AUX
MX W481    8785   MAIN:Data Remaining After End of Year. Number of Hours=          24
```

**MODELOPTs: RegDFAULT CONC ELEV

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 2 Short Term Average(s) of: 1-HR 8-HR

**This Run Includes: 3 Source(s); 4 Source Group(s); and 8556 Receptor(s)

**The Model Assumes A Pollutant Type of: CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1601.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 6.6 MB of RAM.

**Input Runstream File: SPC_Siemens_SUSD_FI_2yrs_CO.DTA
**Output Print File: SPC_Siemens_SUSD_FI_2yrs_CO.LST

**File for Summary of Results: C:\beast\SPC\SUSDModeling\SPC_Siemens_SUSD_FI_2yrs_CO.SUM

**MODELOPTs: RegDFAULT CONC ELEV

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SPC02.SFC Met Version: 11059
Profile file: SPC02.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 72572 Upper air station no.: 24127
Name: UNKNOWN Name: SALT_LAKE_CITY,UT
Year: 2001 Year: 2001

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
01	08	06	218	01	-29.3	0.330	-9.000	-9.000	-999.	436.	95.4	0.11	0.74	1.00	3.60	132.	6.1	295.4	2.0
01	08	06	218	02	-24.4	0.275	-9.000	-9.000	-999.	334.	66.5	0.11	0.74	1.00	3.10	125.	6.1	295.4	2.0
01	08	06	218	03	-13.6	0.145	-9.000	-9.000	-999.	136.	17.3	0.11	0.74	1.00	2.10	188.	6.1	292.0	2.0
01	08	06	218	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.11	0.74	1.00	0.00	0.	6.1	293.1	2.0
01	08	06	218	05	-4.7	0.074	-9.000	-9.000	-999.	46.	6.7	0.11	0.74	1.00	1.50	124.	6.1	291.4	2.0
01	08	06	218	06	-16.2	0.227	-9.000	-9.000	-999.	248.	56.1	0.11	0.74	1.00	2.60	156.	6.1	290.9	2.0
01	08	06	218	07	9.4	0.361	0.246	0.005	49.	499.	-390.0	0.11	0.74	0.40	3.60	143.	6.1	295.4	2.0
01	08	06	218	08	53.8	0.332	0.587	0.007	117.	441.	-53.1	0.11	0.74	0.25	3.10	136.	6.1	297.0	2.0
01	08	06	218	09	97.6	0.343	0.891	0.006	226.	462.	-32.3	0.11	0.74	0.20	3.10	163.	6.1	300.4	2.0
01	08	06	218	10	134.5	0.261	1.103	0.014	310.	309.	-10.3	0.11	0.74	0.19	2.10	224.	6.1	303.1	2.0
01	08	06	218	11	163.0	0.266	1.272	0.009	396.	315.	-9.0	0.11	0.74	0.18	2.10	302.	6.1	305.9	2.0
01	08	06	218	12	179.5	0.213	1.426	0.005	503.	227.	-4.2	0.11	0.74	0.18	1.50	296.	6.1	305.9	2.0
01	08	06	218	13	187.0	0.359	1.561	0.005	633.	496.	-19.3	0.11	0.74	0.18	3.10	216.	6.1	308.1	2.0
01	08	06	218	14	182.6	0.448	1.930	0.005	1226.	690.	-38.3	0.11	0.74	0.18	4.10	312.	6.1	308.1	2.0
01	08	06	218	15	167.5	0.356	1.917	0.005	1310.	494.	-21.0	0.11	0.74	0.18	3.10	296.	6.1	308.1	2.0
01	08	06	218	16	141.4	0.262	1.842	0.005	1375.	313.	-9.9	0.11	0.74	0.19	2.10	300.	6.1	307.0	2.0
01	08	06	218	17	107.2	0.390	1.916	0.005	2051.	561.	-43.3	0.11	0.74	0.20	3.60	5.	6.1	307.0	2.0
01	08	06	218	18	96.8	0.412	2.015	0.005	2557.	609.	-54.6	0.06	0.74	0.24	4.90	208.	10.0	299.8	2.0
01	08	06	218	19	21.9	0.267	1.362	0.005	3487.	329.	-65.4	0.06	0.74	0.37	3.20	186.	10.0	298.2	2.0
01	08	06	218	20	-7.3	0.093	-9.000	-9.000	-999.	100.	8.4	0.06	0.74	0.75	2.40	229.	10.0	295.4	2.0
01	08	06	218	21	-3.1	0.066	-9.000	-9.000	-999.	39.	6.8	0.06	0.74	1.00	1.70	204.	10.0	293.5	2.0
01	08	06	218	22	-1.6	0.047	-9.000	-9.000	-999.	23.	4.8	0.06	0.74	1.00	1.20	224.	10.0	292.4	2.0
01	08	06	218	23	-2.4	0.057	-9.000	-9.000	-999.	31.	5.7	0.05	0.74	1.00	1.50	326.	10.0	291.1	2.0
01	08	06	218	24	-1.1	0.039	-9.000	-9.000	-999.	18.	4.0	0.06	0.74	1.00	1.00	38.	10.0	290.1	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
01	08	06	01	6.1	1	132.	3.60	295.4	-999.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
STACKS	HIGH	1ST HIGH VALUE IS	2918.41062	ON 01122302:	AT (411200.00, 4301600.00, 1734.38, 2753.55, 0.00)	DC
AUX	HIGH	1ST HIGH VALUE IS	33.78120	ON 02072106:	AT (413600.00, 4302600.00, 1679.02, 2753.55, 0.00)	DC
SPC	HIGH	1ST HIGH VALUE IS	2919.26981	ON 01122302:	AT (411200.00, 4301600.00, 1734.38, 2753.55, 0.00)	DC
ALL	HIGH	1ST HIGH VALUE IS	2919.26981	ON 01122302:	AT (411200.00, 4301600.00, 1734.38, 2753.55, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
STACKS	HIGH	1ST HIGH VALUE IS	408.93595c	ON 02012508:	AT (412000.00, 4302800.00, 1743.05, 2753.55, 0.00)	DC
AUX	HIGH	1ST HIGH VALUE IS	9.86916	ON 02012916:	AT (414228.70, 4300312.40, 1616.79, 2455.62, 0.00)	DC
SPC	HIGH	1ST HIGH VALUE IS	409.07492c	ON 02012508:	AT (412000.00, 4302800.00, 1743.05, 2753.55, 0.00)	DC
ALL	HIGH	1ST HIGH VALUE IS	409.07492c	ON 02012508:	AT (412000.00, 4302800.00, 1743.05, 2753.55, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 151 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 5 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
CN W305 17 WAKFLG:Stack height > or = EPA formula height for SRCID: STK2
CN W305 38 WAKFLG:Stack height > or = EPA formula height for SRCID: AUX

**MODELOPTs: NonDFAULT CONC ELEV PVMRM

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Allows User-Specified Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
with an Equilibrium NO2/NOx Ratio of 0.750
and with a Default In-stack Ratio of 0.210

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 18 Source(s); 8 Source Group(s); and 8556 Receptor(s)

**The Model Assumes A Pollutant Type of: NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1601.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 24.2 MB of RAM.

**Input Runstream File: SPC_Siemens_SUSD_FI_PVMRM_2yrs_NO2.DTA
**Output Print File: SPC_Siemens_SUSD_FI_PVMRM_2yrs_NO2.LST

**File for Summary of Results: C:\beast\SPC\SUSDModeling\SPC_Siemens_SUSD_FI_PVMRM_2yrs_NO2.SUM

**MODELOPTs: NonDFAULT CONC ELEV PVMRM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SPC02.SFC Met Version: 11059
Profile file: SPC02.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 72572 Upper air station no.: 24127
Name: UNKNOWN Name: SALT_LAKE_CITY,UT
Year: 2001 Year: 2001

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
01	08	06	218	01	-29.3	0.330	-9.000	-9.000	-999.	436.	95.4	0.11	0.74	1.00	3.60	132.	6.1	295.4	2.0
01	08	06	218	02	-24.4	0.275	-9.000	-9.000	-999.	334.	66.5	0.11	0.74	1.00	3.10	125.	6.1	295.4	2.0
01	08	06	218	03	-13.6	0.145	-9.000	-9.000	-999.	136.	17.3	0.11	0.74	1.00	2.10	188.	6.1	292.0	2.0
01	08	06	218	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.11	0.74	1.00	0.00	0.	6.1	293.1	2.0
01	08	06	218	05	-4.7	0.074	-9.000	-9.000	-999.	46.	6.7	0.11	0.74	1.00	1.50	124.	6.1	291.4	2.0
01	08	06	218	06	-16.2	0.227	-9.000	-9.000	-999.	248.	56.1	0.11	0.74	1.00	2.60	156.	6.1	290.9	2.0
01	08	06	218	07	9.4	0.361	0.246	0.005	49.	499.	-390.0	0.11	0.74	0.40	3.60	143.	6.1	295.4	2.0
01	08	06	218	08	53.8	0.332	0.587	0.007	117.	441.	-53.1	0.11	0.74	0.25	3.10	136.	6.1	297.0	2.0
01	08	06	218	09	97.6	0.343	0.891	0.006	226.	462.	-32.3	0.11	0.74	0.20	3.10	163.	6.1	300.4	2.0
01	08	06	218	10	134.5	0.261	1.103	0.014	310.	309.	-10.3	0.11	0.74	0.19	2.10	224.	6.1	303.1	2.0
01	08	06	218	11	163.0	0.266	1.272	0.009	396.	315.	-9.0	0.11	0.74	0.18	2.10	302.	6.1	305.9	2.0
01	08	06	218	12	179.5	0.213	1.426	0.005	503.	227.	-4.2	0.11	0.74	0.18	1.50	296.	6.1	305.9	2.0
01	08	06	218	13	187.0	0.359	1.561	0.005	633.	496.	-19.3	0.11	0.74	0.18	3.10	216.	6.1	308.1	2.0
01	08	06	218	14	182.6	0.448	1.930	0.005	1226.	690.	-38.3	0.11	0.74	0.18	4.10	312.	6.1	308.1	2.0
01	08	06	218	15	167.5	0.356	1.917	0.005	1310.	494.	-21.0	0.11	0.74	0.18	3.10	296.	6.1	308.1	2.0
01	08	06	218	16	141.4	0.262	1.842	0.005	1375.	313.	-9.9	0.11	0.74	0.19	2.10	300.	6.1	307.0	2.0
01	08	06	218	17	107.2	0.390	1.916	0.005	2051.	561.	-43.3	0.11	0.74	0.20	3.60	5.	6.1	307.0	2.0
01	08	06	218	18	96.8	0.412	2.015	0.005	2557.	609.	-54.6	0.06	0.74	0.24	4.90	208.	10.0	299.8	2.0
01	08	06	218	19	21.9	0.267	1.362	0.005	3487.	329.	-65.4	0.06	0.74	0.37	3.20	186.	10.0	298.2	2.0
01	08	06	218	20	-7.3	0.093	-9.000	-9.000	-999.	100.	8.4	0.06	0.74	0.75	2.40	229.	10.0	295.4	2.0
01	08	06	218	21	-3.1	0.066	-9.000	-9.000	-999.	39.	6.8	0.06	0.74	1.00	1.70	204.	10.0	293.5	2.0
01	08	06	218	22	-1.6	0.047	-9.000	-9.000	-999.	23.	4.8	0.06	0.74	1.00	1.20	224.	10.0	292.4	2.0
01	08	06	218	23	-2.4	0.057	-9.000	-9.000	-999.	31.	5.7	0.05	0.74	1.00	1.50	326.	10.0	291.1	2.0
01	08	06	218	24	-1.1	0.039	-9.000	-9.000	-999.	18.	4.0	0.06	0.74	1.00	1.00	38.	10.0	290.1	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
01	08	06	01	6.1	1	132.	3.60	295.4	-999.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
STACKS	1ST HIGHEST VALUE IS	97.29071 AT	(413400.00, 4305000.00, 1785.81, 2753.55, 0.00)	DC	
	2ND HIGHEST VALUE IS	96.07826 AT	(413600.00, 4305200.00, 1785.08, 2753.55, 0.00)	DC	
	3RD HIGHEST VALUE IS	94.67731 AT	(412200.00, 4303600.00, 1809.02, 2753.55, 0.00)	DC	
	4TH HIGHEST VALUE IS	93.93485 AT	(413400.00, 4305200.00, 1809.42, 2753.55, 0.00)	DC	
	5TH HIGHEST VALUE IS	92.36525 AT	(412200.00, 4304200.00, 1791.61, 2753.55, 0.00)	DC	
	6TH HIGHEST VALUE IS	92.32431 AT	(412400.00, 4304200.00, 1803.76, 2753.55, 0.00)	DC	
	7TH HIGHEST VALUE IS	91.97545 AT	(411400.00, 4302000.00, 1771.24, 2753.55, 0.00)	DC	
	8TH HIGHEST VALUE IS	90.22682 AT	(416000.00, 4308000.00, 1759.90, 2753.55, 0.00)	DC	
	9TH HIGHEST VALUE IS	87.05483 AT	(412600.00, 4304200.00, 1786.98, 2753.55, 0.00)	DC	
	10TH HIGHEST VALUE IS	86.81911 AT	(413200.00, 4304800.00, 1802.75, 2753.55, 0.00)	DC	
AUX	1ST HIGHEST VALUE IS	5.82356 AT	(414426.00, 4300428.20, 1615.97, 2455.62, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.55499 AT	(414228.70, 4300312.40, 1616.79, 2455.62, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.54934 AT	(414000.00, 4302800.00, 1673.34, 2753.55, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.48921 AT	(414404.00, 4300428.20, 1616.27, 2455.62, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.30973 AT	(414228.70, 4300287.80, 1616.77, 2455.62, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.19759 AT	(414000.00, 4303000.00, 1677.74, 2753.55, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.91815 AT	(414200.00, 4303000.00, 1671.78, 2753.55, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.87262 AT	(414450.00, 4300450.00, 1615.81, 2455.62, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.78765 AT	(414000.00, 4303200.00, 1679.52, 2753.55, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.71350 AT	(414200.00, 4303200.00, 1673.25, 2753.55, 0.00)	DC	

SPC	1ST HIGHEST VALUE IS	97.29071 AT (	413400.00,	4305000.00,	1785.81,	2753.55,	0.00)	DC		
	2ND HIGHEST VALUE IS	96.07826 AT (	413600.00,	4305200.00,	1785.08,	2753.55,	0.00)	DC		
	3RD HIGHEST VALUE IS	94.67731 AT (	412200.00,	4303600.00,	1809.02,	2753.55,	0.00)	DC		
	4TH HIGHEST VALUE IS	93.93485 AT (	413400.00,	4305200.00,	1809.42,	2753.55,	0.00)	DC		
	5TH HIGHEST VALUE IS	92.36525 AT (	412200.00,	4304200.00,	1791.61,	2753.55,	0.00)	DC		
	6TH HIGHEST VALUE IS	92.32431 AT (	412400.00,	4304200.00,	1803.76,	2753.55,	0.00)	DC		
	7TH HIGHEST VALUE IS	91.97545 AT (	411400.00,	4302000.00,	1771.24,	2753.55,	0.00)	DC		
	8TH HIGHEST VALUE IS	90.22682 AT (	416000.00,	4308000.00,	1759.90,	2753.55,	0.00)	DC		
	9TH HIGHEST VALUE IS	87.05483 AT (	412600.00,	4304200.00,	1786.98,	2753.55,	0.00)	DC		
	10TH HIGHEST VALUE IS	86.81911 AT (	413200.00,	4304800.00,	1802.75,	2753.55,	0.00)	DC		
REDMOND	1ST HIGHEST VALUE IS	20.00661 AT (	424000.00,	4322000.00,	1583.64,	1583.64,	0.00)	DC		
	2ND HIGHEST VALUE IS	16.36142 AT (	424000.00,	4321000.00,	1584.42,	1584.42,	0.00)	DC		
	3RD HIGHEST VALUE IS	14.81144 AT (	424000.00,	4324000.00,	1592.08,	1592.08,	0.00)	DC		
	4TH HIGHEST VALUE IS	11.18882 AT (	424000.00,	4319000.00,	1592.10,	1621.33,	0.00)	DC		
	5TH HIGHEST VALUE IS	11.17606 AT (	424000.00,	4325000.00,	1587.14,	1587.14,	0.00)	DC		
	6TH HIGHEST VALUE IS	9.91348 AT (	424000.00,	4323000.00,	1580.65,	1580.65,	0.00)	DC		
	7TH HIGHEST VALUE IS	8.92033 AT (	425000.00,	4323000.00,	1554.29,	1554.29,	0.00)	DC		
	8TH HIGHEST VALUE IS	8.52655 AT (	424000.00,	4326000.00,	1586.50,	1586.50,	0.00)	DC		
	9TH HIGHEST VALUE IS	7.88361 AT (	423000.00,	4319000.00,	1588.04,	1588.04,	0.00)	DC		
	10TH HIGHEST VALUE IS	7.83855 AT (	423000.00,	4318000.00,	1582.88,	1653.55,	0.00)	DC		

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE	NETWORK GRID-ID
WESTCLAY	1ST HIGHEST VALUE IS	31.22501 AT (	418500.00,	4308500.00,	1597.36,	2636.83,	0.00)	DC
	2ND HIGHEST VALUE IS	27.65032 AT (	419000.00,	4309000.00,	1591.80,	1998.17,	0.00)	DC
	3RD HIGHEST VALUE IS	23.73005 AT (	417800.00,	4306000.00,	1598.59,	2636.83,	0.00)	DC
	4TH HIGHEST VALUE IS	22.68368 AT (	419000.00,	4309500.00,	1596.11,	1998.17,	0.00)	DC
	5TH HIGHEST VALUE IS	22.22383 AT (	417800.00,	4305800.00,	1597.21,	2636.83,	0.00)	DC
	6TH HIGHEST VALUE IS	20.97483 AT (	418000.00,	4307000.00,	1593.01,	2636.83,	0.00)	DC
	7TH HIGHEST VALUE IS	20.49674 AT (	419000.00,	4310000.00,	1603.52,	1985.22,	0.00)	DC
	8TH HIGHEST VALUE IS	20.43713 AT (	417800.00,	4305600.00,	1596.00,	2636.83,	0.00)	DC
	9TH HIGHEST VALUE IS	20.31452 AT (	418500.00,	4309000.00,	1604.83,	1998.17,	0.00)	DC
	10TH HIGHEST VALUE IS	19.68845 AT (	419500.00,	4310000.00,	1594.19,	1594.19,	0.00)	DC
USGYPSUM	1ST HIGHEST VALUE IS	23.74786 AT (	416600.00,	4299000.00,	1612.02,	1957.55,	0.00)	DC
	2ND HIGHEST VALUE IS	19.66308 AT (	416800.00,	4299000.00,	1617.94,	1796.24,	0.00)	DC
	3RD HIGHEST VALUE IS	19.38243 AT (	417000.00,	4299200.00,	1620.65,	1762.52,	0.00)	DC
	4TH HIGHEST VALUE IS	18.00611 AT (	416800.00,	4299200.00,	1627.68,	1762.52,	0.00)	DC
	5TH HIGHEST VALUE IS	17.91990 AT (	416800.00,	4298800.00,	1618.22,	1958.42,	0.00)	DC
	6TH HIGHEST VALUE IS	13.43216 AT (	417600.00,	4300000.00,	1613.33,	1870.97,	0.00)	DC
	7TH HIGHEST VALUE IS	12.24498 AT (	417800.00,	4300200.00,	1616.72,	1870.97,	0.00)	DC
	8TH HIGHEST VALUE IS	12.18448 AT (	417600.00,	4299800.00,	1621.83,	1870.97,	0.00)	DC
	9TH HIGHEST VALUE IS	12.08517 AT (	417800.00,	4301600.00,	1620.63,	1993.64,	0.00)	DC
	10TH HIGHEST VALUE IS	11.50540 AT (	417800.00,	4300400.00,	1614.65,	1994.37,	0.00)	DC
GPACIFIC	1ST HIGHEST VALUE IS	134.99471 AT (	416800.00,	4298600.00,	1638.59,	1958.42,	0.00)	DC
	2ND HIGHEST VALUE IS	130.78082 AT (	417000.00,	4299000.00,	1635.82,	1762.52,	0.00)	DC
	3RD HIGHEST VALUE IS	101.08670 AT (	417200.00,	4299400.00,	1634.76,	1762.52,	0.00)	DC
	4TH HIGHEST VALUE IS	97.78376 AT (	416800.00,	4299200.00,	1627.68,	1762.52,	0.00)	DC
	5TH HIGHEST VALUE IS	95.96830 AT (	416600.00,	4298200.00,	1632.35,	1958.42,	0.00)	DC
	6TH HIGHEST VALUE IS	89.88752 AT (	417400.00,	4299600.00,	1634.42,	1762.52,	0.00)	DC
	7TH HIGHEST VALUE IS	88.07121 AT (	417600.00,	4299600.00,	1634.38,	1763.60,	0.00)	DC
	8TH HIGHEST VALUE IS	84.60525 AT (	417800.00,	4299600.00,	1633.68,	2307.43,	0.00)	DC
	9TH HIGHEST VALUE IS	82.83085 AT (	417200.00,	4298000.00,	1633.55,	2335.67,	0.00)	DC
	10TH HIGHEST VALUE IS	78.50543 AT (	417000.00,	4298000.00,	1639.14,	2313.94,	0.00)	DC
ALL	1ST HIGHEST VALUE IS	135.02204 AT (	416800.00,	4298600.00,	1638.59,	1958.42,	0.00)	DC
	2ND HIGHEST VALUE IS	130.79848 AT (	417000.00,	4299000.00,	1635.82,	1762.52,	0.00)	DC
	3RD HIGHEST VALUE IS	101.14727 AT (	417200.00,	4299400.00,	1634.76,	1762.52,	0.00)	DC
	4TH HIGHEST VALUE IS	98.31462 AT (	416600.00,	4298200.00,	1632.35,	1958.42,	0.00)	DC
	5TH HIGHEST VALUE IS	97.82643 AT (	416800.00,	4299200.00,	1627.68,	1762.52,	0.00)	DC
	6TH HIGHEST VALUE IS	97.29071 AT (	413400.00,	4305000.00,	1785.81,	2753.55,	0.00)	DC
	7TH HIGHEST VALUE IS	96.07826 AT (	413600.00,	4305200.00,	1785.08,	2753.55,	0.00)	DC
	8TH HIGHEST VALUE IS	94.67731 AT (	412200.00,	4303600.00,	1809.02,	2753.55,	0.00)	DC
	9TH HIGHEST VALUE IS	93.93485 AT (	413400.00,	4305200.00,	1809.42,	2753.55,	0.00)	DC
	10TH HIGHEST VALUE IS	92.36525 AT (	412200.00,	4304200.00,	1791.61,	2753.55,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

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**MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                          PVMRM

*** Message Summary : AERMOD Model Execution ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of            4 Warning Message(s)
A Total of          151 Informational Message(s)

A Total of         8784 Hours Were Processed

A Total of            5 Calm Hours Identified

A Total of          146 Missing Hours Identified (  1.66 Percent)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
SO W320     319  PPARM:Input Parameter May Be Out-of-Range for Parameter      DS
CN W305      17 WAKFLG:Stack height > or = EPA formula height for SRCID:    STK2
CN W305      38 WAKFLG:Stack height > or = EPA formula height for SRCID:     AUX
MX W481    8785   MAIN:Data Remaining After End of Year. Number of Hours=     24
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Meteorological Solutions Inc.

Attachment C
Revised NOI Section's 4.0 Including New Subsection 4.7 and Section 5.14

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For new units, an acid rain permit application must be submitted at least 24 months before the date of initial operation of the unit. This application must include the date that the units will commence commercial operation and the deadline for monitoring certification which is 90 days after commencement of commercial operation. SPC will operate in compliance with all applicable provisions of the Title IV Acid Rain program.

4.7 Greenhouse Gas Compliance Monitoring

Since SPC is subject to the requirements of the Acid Rain Program and is required to monitor and report CO_2 emissions according to Part 40 CFR Part 75, SPC will also report annual mass emissions of CO_2, N_2O, and CH_4 per the requirements of 40 CFR Part 98. The use of a CO_2 CEM will demonstrate compliance with the CO_2e emission limitation determined for this project.

4.8 Compliance Assurance Monitoring

The EPA has promulgated requirements for sources to provide detailed monitoring plans that will ensure compliance with all applicable requirements. These monitoring requirements are contained in 40 CFR Part 64. Section 64.2 specifies that these monitoring requirements apply to a "pollutant-specific emissions at a major source" if all of the following are satisfied:

1) The unit is subject to an emission limitation or standard;
2) The unit uses a control device to achieve compliance with any such emission limitation or standard; and
3) The unit has potential pre-control device (uncontrolled) emissions equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

5.14.5 Step 5 - Select BACT

Thus, at this point in time, the only practical way to reduce the amount of CO_2 generated is to minimize the amount of fuel combustion required to produce the desired amount of electricity. This is achieved by operating the equipment efficiently in accordance with manufacturer standards and conducting periodic maintenance on the equipment to keep it at its optimum performance. In comparison to other fuels, natural gas generates a lower amount of CO_2 and will be used exclusively by SPC for the CTs/HRSGs.

To determine an appropriate CO_2 emissions limit for the CT/HRSGs, a search of state and EPA's RBLC databases for recent issued permits was conducted to proposed a BACT emission limit for the CTs/HRSGs, the auxiliary boiler, and convection heaters. Two permits were identified, PacifiCorp Lakeside in Utah County, Utah and Russell Energy Center in Alameda County, California with a CO_2 BACT limit which was 1,100 pounds CO_2 per net megawatt-hour. This CO_2 limit is comparable to the average emissions rate for all natural gas fired power plants of 1135 lbs/MW-hr that was published by EPA[14].

However, in the Response to Comments Document for Russell City Energy Center's project, EPA suggested that a proper BACT value should be established based on: 1) output-based; 2) efficiency-based; 3) and include reasonable assumptions on degradation factors such as a compliance design margin and performance degradation from normal wear and tear. The UDAQ pointed out to the EPA, however, that two factors also need to be accounted in establishing a proper BACT value which include: (1) An adjustment of power output for sources located at a much higher elevation; and (2) a discussion of relative percentage of duct firing since duct firing has a different emissions profile than that of the combustion turbine.

[14] http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html

The Russell City Energy Center established a final efficiency rating of 7730 Btu/kWhr (HHV). This was based on the maximum efficiency of 6,852 Btu/kWhr for each turbine, readjusting to 7,080 Btu/kWhr for an "as installed" rating, and then readjusting again for normal degradation. Russell City is located at an elevation of 16 feet above sea level. The proposed heat input rate for the Russell City Energy Center was 2,038.6 MMBtu/hr for each turbine and an additional 200 MMBtu/hr for duct firing in the HRSG. Lake Side II followed a similar approach and established an efficiency rating of 8,095 Btu/kWhr. Lake Side II is located at an elevation of approximately 4,550 feet above sea level with a proposed a heat input rate of 1762 MMBtu/hr for each turbine and an additional 400 MMBtu/hr for duct firing. The Russell City Energy Center is able to supply more fuel to the turbines given its much lower elevation. The total expected output of the plant is approximately 612 MW with 8.9% of its total heat input coming from duct firing. Lakeside II is a 629 MW plant with 18.5% of its heat input from duct firing.

The proposed SPC facility will have an efficiency rating of approximately 6,883 Btu/kWhr. The SPC facility will be located at approximately 5,303 feet above mean sea-level. The proposed heat input rate of each turbine is a maximum of 1993.2 MMBtu/hr. The proposed heat input to the duct burners will be as high as 540 MMBtu/hr. The proposed SPC facility will be a 580 MW plant with 8.1% of its total heat input coming from duct firing.

Thus, the proposed BACT CO_2e emission limit is based on the maximum heat input rate of the combined cycle unit including both the combustion turbines and the heat recovery systems at the proposed SPC's plant elevation.