

OCTOBER-DECEMBER 2007
QUARTERLY QUALITY ASSURANCE REPORT

FOR THE
WARREN COUNTY AIR MONITORING PROJECT

Ref. No. 7047.08
April 7, 2008

OCTOBER-DECEMBER 2007
QUARTERLY QUALITY ASSURANCE REPORT
FOR THE
WARREN COUNTY AIR MONITORING PROJECT

Prepared For:

Pollution Control Financing Authority of Warren County
Mt. Pisgah Avenue, Quarry Road
P.O. Box 587
Oxford, NJ 07863

Prepared By:

Enviroplan Consulting
Edgewater Commons II
81 Two Bridges Road
Fairfield, NJ 07004

Ref. No. 7047.08
April 7, 2008

Table of Contents

1. Introduction.....	1-1
2. Analysis of Pollutant and Meteorological Data.....	2-1
2.1 Maximum Averages.....	2-1
2.2 Precision Checks.....	2-8
2.3 Accuracy.....	2-11
2.4 Meteorological Data Summary.....	2-13
2.5 Meteorological Audits.....	2-18

List of Tables

Table 1-1:	Data Quality Objectives.....	1-2
Table 2-1:	Maximum Hourly and Five-Minute SO ₂ Averages- Belvidere High School.....	2-2
Table 2-2:	Maximum Hourly and Five-Minute SO ₂ Averages – Demeter Farm...	2-5
Table 2-3:	SO ₂ Single Analyzer Precision Check Results for Belvidere HS.....	2-9
Table 2-4:	SO ₂ Single Analyzer Precision Check Results for Demeter Farm.....	2-10
Table 2-5:	SO ₂ Accuracy Audit Results.....	2-12
Table 2-6:	Horizontal Wind Speed Data Summary.....	2-14
Table 2-7:	Horizontal Wind Direction Data Summary.....	2-15
Table 2-8:	Ambient Temperature Data Summary.....	2-16
Table 2-9:	Solar Radiation Data Summary.....	2-17
Table 2-10:	Quarterly Data Recovery Rates.....	2-19
Table 2-11:	Missing Data Report.....	2-20

List of Appendices

Appendix A: Quarterly Quality Assurance Forms

List of Abbreviations and Terms Used in This Report

- ACO** – Administrative Consent Order
- AMP** – Air Monitoring Plan – The document that presents the overall scope of work for the monitoring program.
- DQOs** - Data Quality Objectives – Established criteria defining data quality goals (i.e., data accuracy, precision, completeness, and representativeness) for the WCAMP. These criteria presented in Table 1-1 of this report
- NJDEP** - New Jersey Department of Environmental Protection
- NAAQS** – National Ambient Air Quality Standards set by the U.S. EPA for specific “criteria” pollutants.
- PCFA**- Pollution Control Financing Authority of Warren County
- QAPP** – Quality Assurance Project Plan – The document that presents the quality assurance and quality control procedures that will be used in the monitoring program to ensure that high quality, representative data are being measured.
- WCAMP** – Warren County Air Monitoring Project
- SO₂** – Sulfur dioxide – A gas formed from the burning of fossil fuels.
- Precision** - The degree of mutual agreement among a series of individual measurements, values, or results; expressed by the standard deviation.
- Accuracy** - Accuracy refers to the closeness of measurements to the correct or accepted value of the quantity measured.
- Completeness** – The number of data values collected and reported over a given time interval compared to the total number of possible data values for that time interval.
- Null Data Codes** – The United States Environmental Protection Agency’s designated coding system used to replace invalid or missing data values. Typical null data codes that may appear in the tabular data are:
- 9991 - Level 1 Zero/Span Check
 - 9995 – Multipoint Calibration
 - 9986- Meteorological calibration; Zero/Span Check
 - 9980 – Analyzer/Sensor Malfunction or Failure
- ppm** – parts per million; a unit of measurement specifying a concentration
- mph** – miles per hour; a unit of measurement for wind speed
- °C** – degrees Celsius (or centigrade); a unit of measurement for temperature

1. Introduction

As a condition of an Administrative Consent Order (ACO) between Pollution Control Financing Authority of Warren County (PCFA) and the New Jersey Department of Environmental Protection (NJDEP), PCFA has elected to establish an ambient air monitoring program in the vicinity of the town of Belvidere in Warren County, New Jersey. Specifically, the Supplemental Environmental Project mandated under the ACO and described in the associated Air Monitoring Plan (AMP) and Quality Assurance Project Plan (QAPP) calls for the monitoring of Sulfur Dioxide (SO₂), and specified meteorological parameters.

The project has been designated the Warren County Air Monitoring Project (WCAMP). The primary purpose of the WCAMP is to obtain and report air quality information from Belvidere and surrounding areas and, where possible, to compare such air quality concentrations to appropriate federal or state standards.

Under the terms of the ACO, PCFA has retained and oversees a qualified contractor, Enviroplan Consulting, to set up and operate the monitoring program. PCFA is required to coordinate these activities through the New Jersey Department of Environmental Protection (NJDEP).

This report provides the quarterly quality assurance data required for the WCAMP air quality and meteorological monitoring network. Procedures governing operation, maintenance, calibration, data reduction, processing, validation and reporting activities as well as attendant quality control, quality assurance and auditing activities conform to the technical guidance contained in the WCAMP AMP and QAPP. These documents have been reviewed and received conditional approval from the NJDEP.

Section 2 of this report provides an analysis of the pollutant and meteorological data collected during the quarter. Tables 2-1 and 2-2 present the maximum hourly and five-minute averages for continuously - measured pollutants. Tables 2-3 and 2-4 present the SO₂ precision results, Table 2-5 presents the SO₂ accuracy audit results, Tables 2-6 through 2-9 present the meteorological data summary, Table 2-10 presents the data collection efficiencies by parameter and Table 2-11 presents explanations for missing data.

Additionally, one appendix is included in this report, which presents the quarterly QA forms.

Table 1-1: Data Quality Objectives

Parameter	Precision (%)	Accuracy	Completeness (%)
SO ₂	≤ ±15	Within ±15% of Observed	≥75
Wind Speed	n/a	Within ± 0.2 m/s + 5% of Observed	≥90
Wind Direction	n/a	Within ±5 degrees azimuth of Observed	≥90
Air Temperature	n/a	Within ±5°C of Observed	≥90
Solar Radiation	n/a	Within ±10% of Observed	≥90

n/a – not applicable

2 Quality Assurance for Pollutant Data

2.1 Maximum Averages for the Quarter

This section provides a summary of the relevant maximum hourly averages for continuously-measured pollutants as they apply to the NAAQS.

Table 2-1: Maximum Hourly and Five-Minute SO2 Averages – Belvidere High School

NAAQS - National Ambient Air Quality Standards			
Pollutant	Average Time	Primary Standard	Secondary Standard
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	0.03 ppm	-
	24-Hour	0.14 ppm	-
	3-Hour	-	0.50 ppm

Belvidere High School									
Parameter/Units	Maximum Running 3-Hour Conc.	Date (Hour)	2nd Highest Running 3-Hour Conc.	Date (Hour)	Maximum Running 24-Hour Conc.	Date (Hour)	2nd Highest Running 24-Hour Conc.	Date (Hour)	Annual Arith. Mean-To-Date
SO2 ppm	.030	11/8 (12)	.022	10/9 (11)	.006	12/18 (19)	.005	12/8 (3), 12/25 (6)	.002
					Maximum 24-Hour Block Conc.	Date	2nd Highest 24-Hour Block Conc.	Date	
					.006	12/18	.004	12/7,12/8	

Belvidere High School					
Parameter/Units	Maximum 5-Minute Conc.	Date (Time)	5-Minute Averages of 0.3 ppm or Greater	1-Hour Average Preceding the 0.3 ppm Average	1-Hour Average Following the 0.3 ppm Average
SO2 ppm	.072	12/16 (14:20)	None	-	-

Table 2-2: Maximum Hourly and Five-Minute SO2 Averages – Demeter Farm

NAAQS - National Ambient Air Quality Standards			
Pollutant	Average Time	Primary Standard	Secondary Standard
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	0.03 ppm	-
	24-Hour	0.14 ppm	-
	3-Hour	-	0.50 ppm

Demeter Farm									
Parameter/ Units	Maximum Running 3-Hour Conc.	Date (Hour)	2 nd Highest Running 3-Hour Conc.	Date (Hour)	Maximum Running 24-Hour Conc.	Date (Hour)	2 nd Highest Running 24-Hour Conc.	Date (Hour)	Annual Arith. Mean-To-Date
SO2 ppm	.164	11/14 (1)	.053	12/10 (13)	.026	11/14 (1)	.016	12/11 (9)	.006
					Maximum 24-Hour Block Conc	Date	2 nd Highest 24-Hour Block Conc.	Date	
					.020	11/13	.015	10/30	

Demeter Farm					
Parameter/Units	Maximum 5- Minute Conc.	Date (Time)	5-Minute Averages of 0.3 ppm or Greater	1-Hour Average Preceding the 0.3 ppm Average	1-Hour Average Following the 0.3 ppm Average
SO2 ppm	.498	11/13 (23:15)	.498 11/13 (23:15) .400 11/13 (23:20) .404 11/13 (23:25) .392 11/13 (23:30) .350 11/13 (23:35) .332 11/13 (23:50)	.014	.102

Maximum Hourly Averages Report - SO2 Validated DataBase
3-Hour Running, Non-Overlapping Averages

4th Quarter 07

Logger Id : DF
Logger Name : Demeter Farm
Avg Interval: 03 hour
Parameter : SO2
Units : PPM
Avg Type : Backward

Rank	Average	Date	Hour
1	.164	11/14/07	01
2	.053	12/10/07	13
3	.028	10/30/07	06
4	.025	10/09/07	11
5	.025	12/17/07	09
6	.023	10/31/07	04
7	.022	10/30/07	00
8	.022	12/11/07	09
9	.021	12/13/07	01
10	.020	11/01/07	23

2.2 Precision Checks

Precision checks for the continuous gas analyzers are scheduled to be performed at least once every two weeks to assess the quality of the monitoring data being reported. Two-point instrument precision response checks are performed by challenging each continuous pollutant analyzer with a known pollutant test gas concentration between 0.095 ppm and 0.105 ppm and between 0.380 ppm and 0.420 ppm. Pollutant test gas concentrations are generated using a currently-certified NIST-traceable dilution calibrator apparatus and certified gas standards.

The results of Level-1 zero/span checks performed biweekly on the SO₂ analyzers in conjunction with precision checks were within established acceptability limits.

The following equations are used for calculating data precision for the continuous analyzers. These equations conform to those contained in 40 CFR Part 58, Appendix B for reporting single instrument data precision for automated measurements used in PSD monitoring programs.

The percent difference for each precision check is calculated using the following equation:

$$d_i = \frac{Y_i - X_i}{X_i} \times 100 \quad \text{Equation (1)}$$

where, d_i is the percent difference for each precision check,
 x_i is the known concentration of the test gas used for the i -th precision check, and
 y_i is the pollutant analyzer's indicated concentration for the i -th precision check.

For each instrument, the quarterly average percent difference (d_j) is calculated using Equation 2, and the standard deviation of these differences (S_j) using Equation 3.

$$d_j = \frac{1}{n} \sum_{i=1}^n d_i \quad \text{Equation (2)}$$

$$S_j = \sqrt{\frac{1}{n-1} \left[\sum d_i^2 - \frac{1}{n} \left(\sum_{i=1}^n d_i \right)^2 \right]} \quad \text{Equation (3)}$$

where,
 n is the number of precision checks performed on the instrument during the quarter.

The 95% Probability Limits for data precision, are calculated as follows:

$$\text{Upper 95\% Probability Limit} = d_j + (1.96)(S_j) \quad \text{Equation (4)}$$

$$\text{Lower 95\% Probability Limit} = d_j - (1.96)(S_j) \quad \text{Equation (5)}$$

Table 2-3: **SO2 Single Analyzer Precision Check Results for Belvidere High School**

Data Period: October-December 2007

Date	Input ppm	Response ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
10/11/07	.100	.100	0.00				
10/17/07	.100	.101	1.00				
11/ 7/07	.100	.100	0.00				
12/ 5/07	.100	.100	0.00				
12/18/07	.100	.100	0.00	0.20	0.45	1.08	-0.68

Date	Input ppm	Response Ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
10/11/07	.400	.399	-0.25				
10/17/07	.400	.403	0.75				
11/ 7/07	.400	.396	-1.00				
11/21/07	.400	.397	-0.75				
12/ 5/07	.400	.396	-1.00				
12/18/07	.400	.393	-1.75	-0.67	0.85	1.00	-2.34

Combined Precision Check Statistical Results- Belvidere HS			
d _j	S _j	95% Probability Limits	
		Upper	Lower
-0.27	0.80	1.30	-1.84

Table 2-4: **SO2 Single Analyzer Precision Check Results for Demeter Farm**

Data Period: October-December 2007

Date	Input ppm	Response ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
10/ 3/07	.100	.101	1.00				
10/17/07	.100	.102	2.00				
11/ 2/07	.100	.101	1.00				
11/15/07	.100	.103	3.00				
11/28/07	.100	.102	2.00				
12/ 5/07	.100	.100	0.00				
12/18/07	.100	.102	2.00	1.57	0.98	3.49	-0.35

Date	Input ppm	Response Ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
10/ 3/07	.400	.400	0.00				
10/17/07	.400	.402	0.50				
11/ 2/07	.400	.396	-1.00				
11/15/07	.400	.400	0.00				
11/28/07	.400	.394	-1.50				
12/ 5/07	.400	.392	-2.00				
12/18/07	.400	.395	-1.25	-0.75	0.92	1.05	-2.55

Combined Precision Check Statistical Results- Demeter Farm			
d _j	S _j	95% Probability Limits	
		Upper	Lower
0.41	1.51	3.37	-2.55

2.3 Accuracy

Independent quality assurance audits are performed once per quarter on the air quality measurement systems. These audits are conducted by qualified personnel not associated with the routine operation and calibration of the monitoring systems, under the supervision of Enviroplan Consulting's Quality Assurance Department using certified, independent calibration standards and equipment. Table 2-5 summarizes the air quality audit results obtained by Enviroplan Consulting during the quarter.

For continuous gas analyzers, the audit consists of challenging each monitor with gas of five known concentrations (including zero), which fall within the instrument's measurement range (0-2.0 ppm). The five known audit gas test input concentrations are within the ranges specified in 40 CFR Part 58, Appendix B. As Table 2-5 indicates, the response of the SO₂ gas analyzer to the all upscale (i.e., non-zero) audit test gas concentrations by were well within the VDEQ and U.S. EPA quality assurance goal of ±15 percent.

The equation used to calculate measurement accuracy is as follows:

$$d_i = \left[\frac{Y_i - X_i}{X_i} \right] \times 100$$

where:

d_i = the difference, in percent, between the known (audit) flow rate and the corresponding sampler-indicated flow rate.

X_i = the known (audit) flow rate.

Y_i = the corresponding sampler-indicated flow rate.

Table 2-5: SO₂ Accuracy Audit Results

Site	Date	Audit Conc. ppm	Indicated Conc.*(DAS) ppm	Percent Difference
Belvidere High School	12/28/07	1.499	1.438	-4.07
SO ₂		0.800	0.783	-2.13
		0.400	0.392	-2.00
		0.100	0.103	3.00
		0.000	0.000	-
Demeter Farm	12/28/07	1.499	1.475	-1.60
SO ₂		0.800	0.787	-1.63
		0.400	0.393	-1.75
		0.100	0.105	5.00
		0.000	0.004	-

Notes to Table 2-5:

*DAS - Data Acquisition System

2.4 Meteorological Data

This meteorological data summary includes the data collected at the Belvidere High School and Demeter Farm sites from October 1, 2007 through December 31, 2007. Tables 2-6 through 2-10 present the maximum and average values for each meteorological parameter.

Table 2-6: **Horizontal Wind Speed Data Summary**

	Belvidere High School				Demeter Farm			
Month	Average mph	Maximum mph	Date	Hour	Average mph	Maximum mph	Date	Hour
October	2.9	10.8	10/9	13	8.3	22.9	10/12	13
November	3.3	11.9	11/16	12	9.8	23.6	11/23	4
December	3.8	17.5	12/16	22	10.0	26.1	12/3	12

Table 2-7: **Horizontal Wind Direction Data Summary**

	Belvidere High School	Demeter Farm
Month	Average Degrees	Average Degrees
October	36	236
November	344	279
December	342	311

Table 2-8: **Ambient Temperature Data Summary**

Demeter Farm				
Month	Average °C	Maximum °C	Date	Hour
October	14.7	28.1	10/8	14
November	4.1	16.9	11/22	13
December	-0.5	15.1	12/23	18

Table 2-9: **Solar Radiation Data Summary**

Demeter Farm				
Month	Average W/M²	Maximum W/M²	Date	Hour
October	123	674	10/4	12
November	78	589	11/2	11
December	53	474	12/20	12

2.5 Meteorological Audits

Meteorological audits are performed at (minimum) semi-annual intervals subsequent to initial startup calibration of the meteorological monitoring system.

There were no audits performed on the meteorological system during this quarter.

Table 2-10: Quarterly Data Recovery Rates

Site	Parameter	Month	Monthly Data Recovery Rate (%)	Quarterly Data Recovery Rate (%)
Belvidere High School	SO2	October	99.6	99.2
		November	98.9	
		December	99.1	
	Horizontal Wind Speed	October	99.7	99.6
		November	99.6	
		December	99.6	
	Horizontal Wind Direction	October	99.7	99.6
		November	99.6	
		December	99.6	
	Standard Deviation	October	99.7	99.6
		November	99.6	
		December	99.6	
Demeter Farm	SO2	October	99.5	99.3
		November	99.3	
		December	99.2	
	Horizontal Wind Speed	October	99.7	94.9
		November	99.6	
		December	85.4	
	Horizontal Wind Direction	October	99.7	99.2
		November	99.6	
		December	98.3	
	Standard Deviation	October	99.7	99.2
		November	99.6	
		December	98.3	
	Temperature	October	99.7	99.7
		November	99.6	
		December	99.7	
	Solar Radiation	October	99.7	99.7
		November	99.6	
		December	99.7	

General Notes:

Data collection efficiencies are based on the number of valid data values reported from a given monitor divided by the total number of possible data values in the reporting period. For continuously-measured parameters, the total number of possible data values is the number of hours in the reporting period; for episodic monitors, the total number of possible data values is the number of scheduled sample events in the reporting period. The resulting ratio is expressed as a percentage.

When monitoring operations begin other than on the first day and hour of the reporting period, or in instances where agency approval for suspension of monitoring for a portion of the reporting period has occurred, calculation of data collection efficiencies for the reporting period is as described above except that the total number of possible data values is pro-rated in accordance with the actual active monitoring interval.

n/a – not applicable

Table 2-11: Missing Data Report

The following table describes periods of invalid data due to instrument malfunction, power outages and weather related data loss. Periods of routine instrument testing are not included in explanations of missing data.

October			
Site	Date (Hours)	Parameter	Explanation
All Parameters Satisfactory			

November			
Site	Date (Hours)	Parameter	Explanation
All Parameters Satisfactory			

December			
Site	Date (Hours)	Parameter	Explanation
Demeter Farm	12/2 (23), 12/3 (0), 12/9 (19-23), 12/10 (0-10), 12/13 (13-23), 12/14 (0-11), 12/16 (7-23), 12/17 (0-14), 12/26 (20-23), 12/27 (0-15), 12/30 (22-23), 12/31 (0-11)	HWS	Frozen sensor
	12/10 (3-8), 12/13 (15-18), 12/16 (16)	HWD, STDV	Frozen sensor

Appendix A: Quality Assurance Forms

SULFUR DIOXIDE (SO₂) AUDIT FORM

Network: <u>PCFA</u>	Site: <u>Belvidere H.S.</u>	Audit Date: <u>12/25/07</u>
Time Off-Line: <u>14:46 EST</u>	Time On-Line: <u>16:58 EST</u>	Shelter Temperature: <u>23.2°C</u>

Site Equipment	Analyzer Mfg./Model No.: <u>TECO 43C</u>	S/N: <u>43C-62120-336</u>	Cal. Date: <u>12/15/07</u>
	Analyzer Calibration Settings: Span Setting: <u>0.846</u>		Zero Setting: <u>0.0346</u>
	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>4072802</u>	Cal. Date: <u>7/17/07</u>
	Gas Cylinder Vendor and S/N: <u>Scott Murrin Gases Cyl. #JJ590</u>		Tank Pressure: <u>1,800</u> PSIG
	Gas Cylinder Cert. Date: <u>12/6/06</u>		SO ₂ Conc. (ppm): <u>50.4</u>

Audit System	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>13278</u>	Cal. Date: <u>7/31/07</u>
	Zero Air Supply Mfg./Model No.: <u>"UNIT"</u>		S/N: <u>None</u>
	Gas Cylinder Vendor and S/N: <u>Scott Murrin Gases Cyl. #JJ23841</u>		Tank Pressure: <u>1,900</u> PSIG
	Gas Cylinder Cert. Date: <u>4/10/07</u>		SO ₂ Conc. (ppm): <u>51.1</u>

Calibrant Gas Flow		Calibrator Dilution Flow		Audit Conc.	System Response			Results
Calibrator Setting	SCCM	Calibrator Setting	SCCM		Chart Recorder	Analyzer Value	DAS (ppm)	
OFF	OFF	1.50	1,550.93	0.000	0.3%	0.0005	0.000	-
46.3	46.87	↓	↓	1.499	73.4%	7.138 v	1.438	-4.1%
42.8	43.33	2.60	2,724.48	0.800	40.0%	3.919 v	0.783	-2.1%
41.2	41.72	5.00	5,284.96	0.400	20.4%	1.980 v	0.392	-2.0%
10.2	10.36	↓	↓	0.100	5.8%	0.510 v	0.103	+3.0%
OFF	OFF	↓	↓	0.000	0.5%	0.0005	0.000	-
Average Δ% =								-1.3%

Slope = 0.9587446 Intercept = 0.0064948 Correlation Coeff. (R) = 0.99994

Notes: _____

Auditor: [Signature]

QA Review: [Signature]
ENVIROPLAN CONSULTING

**AIR QUALITY SYSTEMS AUDIT REPORT FOR CONTINUOUS
GASEOUS POLLUTANT MEASUREMENT SYSTEMS (Page 1 of 2)**

Site Name and Address: Network: SCFA; Belvidere HS.
 Site AIRS ID. No.: _____ Audit Date: 12/28/07 Auditor: D. Cunningham
 Measurement System Audited: _____ NO-NO₂-NO_x; _____ NO-NO_x; _____ SO₂; CO; _____ O₃; _____ H₂S

(NOTE: All "NO" responses MUST be explained in the "Comments" Section of this form)

MONITORING EQUIPMENT			
Parameter	Monitor Make/Model	S/N	Last Calibrated
SO ₂	TECO 43C	43C/2120-336	12/5/07

GENERAL SITE CONDITIONS	YES	NO
1. Is station interior clean, neat and orderly?	<input checked="" type="checkbox"/>	
2. Is the equipment shelter structurally sound and safe?	<input checked="" type="checkbox"/>	
3. Is the shelter temperature stable ($\pm 3^{\circ}\text{C}$) and maintained within 20°C - 30°C?	<input checked="" type="checkbox"/>	
4. Is the sample delivery train in good condition, clean and free of moisture?	<input checked="" type="checkbox"/>	
5. Does the sample probe siting and exposure conform to U.S. EPA guidelines?	<input checked="" type="checkbox"/>	
6. Are the site grounds well maintained?	<input checked="" type="checkbox"/>	
7. Are safe working conditions maintained at site?	<input checked="" type="checkbox"/>	

OPERATIONS: CONTINUOUS ANALYZER	YES	NO
1. Is analyzer operated in accordance with EPA equivalency requirements?	<input checked="" type="checkbox"/>	
2. Are all analyzer operating status indications normal?	<input checked="" type="checkbox"/>	
3. Does analyzer's current calibration status conform with S.O.P. requirements?	<input checked="" type="checkbox"/>	
4. Are bi-weekly Z/P/S checks regularly and properly performed?	<input checked="" type="checkbox"/>	
5. Is sample particulate filter changed at least once every two weeks?	<input checked="" type="checkbox"/>	
6. Do current analyzer span (cal.) setting(s) agree with the most recent multi-point cal.?	<input checked="" type="checkbox"/>	
7. Do current analyzer Zero (cal.) setting(s) agree with those on most recent zero check?	<input checked="" type="checkbox"/>	
8. Are weekly analyzer checks and routine maintenance performed?	<input checked="" type="checkbox"/>	
9. Is analyzer output signal stable and noise-free? (Review response check traces).	<input checked="" type="checkbox"/>	
10. Is analyzer well-maintained and maintenance documented?	<input checked="" type="checkbox"/>	

**AIR QUALITY SYSTEMS AUDIT REPORT FOR CONTINUOUS
GASEOUS POLLUTANT MEASUREMENT SYSTEMS (Page 2 of 2)**

Site Name and Address: Metwacki PCFA, Belvidere H.S.
 Site AIRS I.D. No.: _____ Audit Date: 12/28/07 Auditor: D. Cummings
 Measurement System Audited: _____ NO-NO₂-NO_x; _____ NO-NO_x; _____ SO₂; CO; _____ O₃; _____ H₂S

OPERATIONS: SUPPORT EQUIPMENT	YES	NO
1. Is D.A.S. indicated time and date correct? (Time=current local std. time ± 5 min.)	✓	
2. Does D.A.S. accurately acquire and convert analyzer output to engineering units?	✓	
3. Is data telemetry system functional and data regularly polled and reviewed?	✓	
4. Does D.A.S. automatically recover from power outages and log these events?	✓	
5. Are chart traces clear, legible and accurate?	✓	
6. Is calibrator calibration current and meet S.O.P. requirements?	✓	
7. Are other calibration standards (gases, etc.) currently certified? (Per S.O.P. reqm'ts).	✓	

DOCUMENTATION AND FORMS	Date of Documentation	YES	NO
1. Are analyzer calibrations properly performed and documented?	12/5/07	✓	
2. Are calibrator calibrations properly performed and documented?	7/17/07	✓	
3. Are Z/T/S checks properly performed and documented?	December 2007	✓	
4. Are routine checks and maintenance properly documented?	December 2007 & site logbook	✓	
5. Are charts properly documented and annotated each site visit?	December 2007	✓	
6. Are station logbook entries detailed, complete and up-to-date?	"	✓	
7. Are certificates of calibration for cal. equip. and stds. maintained?	On file, Fairfield, NJ	✓	

OVERALL COMMENTS	YES	NO
1. Overall, is the station and monitoring equipment well maintained?	✓	
2. Overall, are S.O.P.'s for QA/QC followed and implemented?	✓	
3. Overall, is the site operator knowledgeable and well-trained?	✓	
4. Overall, is data quality consistent with established objectives?	✓	

COMMENTS

SO₂ chart recorder seems to be susceptible to paper jams.
This recorder should be repaired or replaced.

Auditor: D. Cummings

ENVIROPLAN CONSULTING

SULFUR DIOXIDE (SO₂) AUDIT FORM

Network: <u>PCEA</u>	Site: <u>Danmeter Farm</u>	Audit Date: <u>12/25/07</u>
Time Off-Line: <u>11:47 EST</u>	Line On-Line: <u>13:31 EST</u>	Shelter Temperature: <u>25.2 °C</u>

Site Equipment	Analyzer Mfg./Model No.: <u>TECO 43C</u>	S/N <u>43C-62121-336</u>	Cal. Date: <u>11/28/07</u>
	Analyzer Calibration Settings: Span Setting: <u>1.132</u> Zero Setting: <u>0.0228</u>		
	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>4072802</u>	Cal. Date: <u>7/12/07</u>
	Gas Cylinder Vendor and S/N: <u>Scott Marris Gases Cyl. #JJ590</u>	Tank Pressure: <u>1,800</u>	PSIG
	Gas Cylinder Cert. Date: <u>12/16/06</u>	SO ₂ Conc. (ppm): <u>50.4</u>	

Audit System	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N <u>13278</u>	Cal. Date: <u>7/31/07</u>
	Zero Air Supply Mfg./Model No.: <u>'UNIT'</u> S/N: <u>None</u>		
	Gas Cylinder Vendor and S/N: <u>Scott Marris Gases Cyl. #JJ23841</u>	Tank Pressure: <u>1,900</u>	PSIG
	Gas Cylinder Cert. Date: <u>4/10/07</u>	SO ₂ Conc. (ppm): <u>51.1</u>	

Calibrator Gas Flow		Calibrator Dilution Flow		Audit Conc. ppm	System Response			Results Δ%
Calibrator Setting	SCCM	Calibrator Setting	SCCM		Chan Recorder	Analyze Vols	DAS (ppm)	
OFF	OFF	<u>1.50</u>	<u>1,580.93</u>	<u>.000</u>	<u>0.2%</u>	<u>0.018v</u>	<u>0.004</u>	<u>-</u>
<u>46.3</u>	<u>46.87</u>	<u>↓</u>	<u>1,550.93</u>	<u>1.499</u>	<u>73.7%</u>	<u>2.376v</u>	<u>1.475</u>	<u>-1.6%</u>
<u>42.8</u>	<u>43.33</u>	<u>2.60</u>	<u>2,724.48</u>	<u>0.800</u>	<u>39.4%</u>	<u>3.957v</u>	<u>0.787</u>	<u>-1.6%</u>
<u>41.2</u>	<u>41.72</u>	<u>5.00</u>	<u>5,284.96</u>	<u>0.400</u>	<u>19.7%</u>	<u>1.9481v</u>	<u>0.393</u>	<u>-1.8%</u>
<u>10.2</u>	<u>10.36</u>	<u>↓</u>	<u>↓</u>	<u>0.100</u>	<u>5.4%</u>	<u>0.5083v</u>	<u>0.105</u>	<u>+5.0%</u>
OFF	OFF	<u>↓</u>	<u>↓</u>	<u>0.000</u>	<u>0.3%</u>	<u>0.018v</u>	<u>0.004</u>	<u>-</u>
Average Δ% =								<u>0.0%</u>

Slope = 0.980483 Intercept = 0.003926 Correlation Coeff. (R) = 0.999992

Notes: _____

Auditor: [Signature]

QA Review: [Signature]
ENVIROPLAN CONSULTING

**AIR QUALITY SYSTEMS AUDIT REPORT FOR CONTINUOUS
GASEOUS POLLUTANT MEASUREMENT SYSTEMS (Page 1 of 2)**

Site Name and Address: Network: PCFA; Demeter Facor
 Site AQS ID No.: _____ Audit Date: 12/28/07 Auditor: D. Cummings
 Measurement System Audited: _____ NO-NO₂-NO_x; _____ NO-NO_x; _____ SO₂; CO; _____ O₃; _____ H₂S

(NOTE: All "NO" responses MUST be explained in the "Comments" Section of this form)

MONITORING EQUIPMENT			
Parameter	Monitor Make/Model	S/N	Last Calibrated
SO ₂	TECO 43C	43C-02121-336	11/28/07

GENERAL SITE CONDITIONS	YES	NO
1. Is station interior clean, neat and orderly?	<input checked="" type="checkbox"/>	
2. Is the equipment shelter structurally sound and safe?	<input checked="" type="checkbox"/>	
3. Is the shelter temperature stable ($\pm 3^{\circ}\text{C}$) and maintained within 20°C - 30°C?	<input checked="" type="checkbox"/>	
4. Is the sample delivery train in good condition, clean and free of moisture?	<input checked="" type="checkbox"/>	
5. Does the sample probe siting and exposure conform to U.S. EPA guidelines?	<input checked="" type="checkbox"/>	
6. Are the site grounds well maintained?	<input checked="" type="checkbox"/>	
7. Are safe working conditions maintained at site?	<input checked="" type="checkbox"/>	

OPERATIONS: CONTINUOUS ANALYZER	YES	NO
1. Is analyzer operated in accordance with EPA equivalency requirements?	<input checked="" type="checkbox"/> <i>Note 2</i>	
2. Are all analyzer operating status indications normal?	<input checked="" type="checkbox"/>	
3. Does analyzer's current calibration status conform with S.O.P. requirements?	<input checked="" type="checkbox"/>	
4. Are bi-weekly Z/P/S checks regularly and properly performed?	<input checked="" type="checkbox"/>	
5. Is sample particulate filter changed at least once every two weeks?	<input checked="" type="checkbox"/>	
6. Do current analyzer span (cal.) setting(s) agree with the most recent multi-point cal.?	<input checked="" type="checkbox"/>	
7. Do current analyzer Zero (cal.) setting(s) agree with those on most recent zero check?	<input checked="" type="checkbox"/>	
8. Are weekly analyzer checks and routine maintenance performed?	<input checked="" type="checkbox"/>	
9. Is analyzer output signal stable and noise free? (Review response check traces).	<input checked="" type="checkbox"/>	
10. Is analyzer well maintained and maintenance documented?	<input checked="" type="checkbox"/>	

**AIR QUALITY SYSTEMS AUDIT REPORT FOR CONTINUOUS
GASEOUS POLLUTANT MEASUREMENT SYSTEMS (Page 2 of 2)**

Site Name and Address: Networks PCFA; Demeter Farm
 Site AIRS I.D. No.: _____ Audit Date: 12/28/07 Auditor: D. Cummings
 Measurement System Audited: _____ NO NO₂ NO_x; _____ NO-NO_x; _____ SO₂; CO; _____ O₃; _____ H₂S

OPERATIONS: SUPPORT EQUIPMENT	YES	NO
1. Is D.A.S.-indicated time and date correct? (Time=current local std. time ± 5 min.)	✓	
2. Does D.A.S. accurately acquire and convert analyzer output to engineering units?	✓	
3. Is data telemetry system functional and data regularly polled and reviewed?	✓	
4. Does D.A.S. automatically recover from power outages and log these events?	✓	
5. Are chart traces clear, legible and accurate?	✓	
6. Is calibrator calibration current and meet S.O.P. requirements?	✓	
7. Are other calibration standards (gases, etc.) currently certified? (Per S.O.P. reqm'ts).	✓	

DOCUMENTATION AND FORMS	Date of Documentation	YES	NO
1. Are analyzer calibrations properly performed and documented?	<u>11/28/07</u>	✓	
2. Are calibrator calibrations properly performed and documented?	<u>7/17/07</u>	✓	
3. Are ZTYS checks properly performed and documented?	<u>December 2007</u>	✓	
4. Are routine checks and maintenance properly documented?	<u>"</u>	✓	
5. Are charts properly documented and annotated each site visit?	<u>"</u>	✓	
6. Are station logbook entries detailed, complete and up-to-date?	<u>Site Log book</u>	✓	
7. Are certificates of calibration for cal. equip. and stds. maintained?	<u>At Fairfield, NY</u>	✓	

OVERALL COMMENTS	YES	NO
1. Overall, is the station and monitoring equipment well maintained?	✓	
2. Overall, are S.O.P.'s for QA/QC followed and implemented?	✓	
3. Overall, is the site operator knowledgeable and well-trained?	✓	
4. Overall, is data quality consistent with established objectives?	✓	

COMMENTS

Site is well-maintained.

Auditor: D. Cummings

ENVIROPLAN CONSULTING