AIR SCIENCES INC.

40 CFR Part 64 Compliance Assurance Monitoring (CAM) Plan

Western 102 Power Plant

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SELECTIVE CATALYTIC REDUCTION SYSTEM FOR NO_X CONTROL OF SYSTEM 01

I. Background

A. Emission Unit

Description:	14 Wartsila natural-gas reciprocating internal combustion engines
Identification:	Selective Catalytic Reduction (SCR) system controlling System 01, S2.001 – S2.014
Facility:	Western 102 Power Plant, Barrick Goldstrike Mines Inc., Nevada

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Regulation:	Class I Operating Permit No. AP4911-2189 (permit)
Emission Limits:	
Nitrogen Oxides (NO_X)	1.49 lb/hr, each
Monitoring Requirements:	Continuous monitoring of the catalyst bed temperature Continuous monitoring of the urea/ammonia flow rate

C. Control Technology

The control system is a selective catalytic reduction system.

II. Monitoring Approach

The key elements of the monitoring approach are presented in Table 1.

Table 1: SCR System Monitoring Approach

I. Indicator	Catalyst Bed Outlet Temperature	Urea/Ammonia Injection Rate
Measurement Approach	Operate and maintain a temperature gauge (thermocouple) to continuously record the temperature of the SCR catalyst bed of each generator.	Operate and maintain a flow indicator to continuously record the urea/ammonia sent to the SCR catalyst bed of each generator.
II. Indicator Range	Except during periods of start-up,[1] an excursion is defined as a temperature of less than 500°F and greater than 932°F. Excursions trigger an inspection, corrective action, and a reporting requirement. A computer system automatically records and alerts if the catalyst bed temperature is not within the indicated range above.	Except during periods of start-up,[1] an excursion is defined as a urea/ ammonia flow of less than 1.6 gallons of urea/ammonia per hour and greater than 13.2 gallons per hour. Excursions trigger an inspection, corrective action, and a reporting requirement. A computer system automatically records and alerts if the urea/ammonia injection rate is not within the indicated range above.
III. Performance Criteria		
A. Data Representativeness	The thermocouple is located at the catalyst bed outlet.	The flow indicator is located in the urea/ammonia injection line.
B. Verification of Operation Status	The thermocouple is an existing device currently operating.	The urea/ammonia flow meter is an existing device currently operating.
C. QA/QC Practices and Criteria	The accuracy of the thermocouple is verified by a secondary thermocouple.	The urea/ammonia flow meter was calibrated by the manufacturer upon installation.
D. Monitoring Frequency	Instantaneous readings of the catalyst bed temperature are collected every five minutes.	Instantaneous readings of the urea/ ammonia injection rate are collected every five minutes.
Data Collection Procedures	A computer system automatically records the catalyst bed temperature.	A computer system automatically records the urea/ammonia flow rate.
Averaging Period	Not applicable.	Daily.

[1] During periods of start-up, the controls are not required to be operational and not relied upon to meet an emission limit. Therefore, these periods are not subject to CAM.

JUSTIFICATION

I. Background

The pollutant-specific emissions units are the 14 Wartsila natural-gas reciprocating internal combustion engines. Nitrogen oxides are controlled by a Selective Catalytic Reduction (SCR) system.

II. Rationale for Selection of Performance Indicators

A. Catalyst Bed Outlet Temperature

The temperature at the outlet to the catalyst bed provides a good indication of catalytic reduction performance because it indicates that the gas stream is at sufficient temperature to initiate reduction of NO_X on the catalyst. Too high of a temperature may cause NO_X generation in the SCR rather than NO_X reductions. Too low of a temperature reduces catalyst activity and urea/ammonia slip increases.

B. Urea/Ammonia Injection Rate

The urea/ammonia injection rate is a good performance indicator because the ratio of urea/ammonia to NO_X controls the NO_X reduction efficiency. The ratio of urea/ammonia to NO_X should be optimized; too much urea/ammonia can result in excess "urea/ammonia slip," and too little urea/ammonia results in increased NO_X emissions.

III. Rationale for Catalyst Bed Outlet Temperature and Urea/Ammonia Injection Rate Indicator Ranges

The indicator range selected for the SCR catalyst bed outlet temperature is greater than 500°F and less than 932°F, and for the urea/ammonia injection rate it is greater than 1.6 gallons per hour and less than 13.2 gallons per hour. When an excursion occurs, corrective action will be initiated, documented, and reported.

These selected indicator ranges are based on the following:

- Engineering assessments and manufacturer's recommendations in accordance with 40 CFR 64.4(c)(1);
- Emissions, SCR catalyst bed temperature, and the urea/ammonia injection rate measured and recorded during performance testing in accordance with 40 CFR 64.4(c)(1); and
- The level of the measured emissions relative to the compliance limitation in accordance with 60 CFR 64.3(c).

The temperature and urea/ammonia flow rate ranges were specified by the manufacturer's operating instructions and verified through performance testing. The last five years of annual performance test data are available in Attachment 1. Attachment 1 provides the NO_X emission rate, the percent this emission rate was below the permitted emission limit, the SCR catalyst bed temperature, and the urea/ammonia injection rate measured during the performance tests. These tests show that NO_X emissions are controlled to below the permitted limit for each engine when SCR catalyst bed temperature and the urea/ammonia injection rate are maintained within the indicator ranges.

IV. Excursion Reporting

Semiannual excursion reports will be submitted in accordance with 40 CFR § 64.9. These reports will include:

- The number, duration, and cause of excursions or exceedances, and the corrective actions taken
- The number, duration, and cause of monitor downtime incidents

V. Testing Schedule

Each compliance test will be conducted on an annual basis with no more than one year and 90 days between compliance tests per the requirements of Section VI.A.4.a. of the permit.

VI. Implementation Plan

The monitoring described in this plan will be implemented upon the issuance of the renewal of Western 102 Class I Operating Permit per 40 CFR 64.7(a).

CATALYTIC OXIDIZER FOR CO AND HCHO CONTROL OF SYSTEM 01

I. Background

A. Emission Unit

Description:	14 Wartsila natural-gas reciprocating internal combustion engines
Identification:	Catalytic Oxidizer controlling system 01, S2.001 – S2.014
Facility:	Western 102 Power Plant, Barrick Goldstrike Mines Inc., Nevada

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Regulation:	Class I Operating Permit No. AP4911-2189 (permit)
Emission Limits:	
Carbon Monoxide	2.42 lb/hr, each
Formaldehyde	0.35 lb/hr, each (All HAPs including formaldehyde)
Monitoring Requirements:	Continuous monitoring of the catalytic oxidizer temperature

C. Control Technology

The control system is a catalytic oxidizer.

II. Monitoring Approach

The key elements of the monitoring approach are presented in Table 2.

Table 2: Catalytic Oxidizer Monitoring Approach

I. Indicator	Catalytic Oxidizer Outlet Temperature
Measurement Approach	Operate and maintain a temperature gauge (thermocouple) to continuously record the temperature of the catalytic oxidizer of each generator.
II. Indicator Range	Except during periods of start-up,[2] an excursion is defined as a temperature reading (described above) of less than 500ºF or greater than 932ºF. Excursions trigger an inspection, corrective action, and a reporting requirement. A computer system automatically records and alerts if the temperature is not within the indicated range above.
III. Performance Criteria	
A. Data Representativeness	The thermocouple is located at the catalyst bed outlet.
B. Verification of Operation Status	The thermocouple is an existing device currently operating.
C. QA/QC Practices and Criteria	The accuracy of the thermocouple is verified by a secondary thermocouple.
D. Monitoring Frequency	Instantaneous readings of the catalyst bed temperature are collected every five minutes.
Data Collection Procedures	A computer system automatically records the catalyst bed temperature.
Averaging Period	Not applicable.

[2] During periods of start-up, the controls are not required to be operational and not relied upon to meet an emission limit. Therefore, these periods are not subject to CAM.

JUSTIFICATION

I. Background

The pollutant-specific emission units are the 14 Wartsila natural-gas reciprocating internal combustion engines. Carbon monoxide and formaldehyde emissions are controlled by a catalytic oxidizer.

II. Rationale for Selection of Performance Indicators on the Catalyst Bed Outlet Temperature

The temperature at the outlet to the catalyst bed is a key catalytic oxidizer operating parameter. The gas stream must be heated to a minimum temperature at which catalytic oxidation will occur in the bed. Above this minimum temperature, control efficiency increases as temperature increases. However, there is a maximum operating temperature above which the catalyst begins to sinter.

III. Rationale for Catalyst Bed Outlet Temperature Indicator Range

The indicator range selected for the catalytic oxidizer temperature is greater than 500°F and less than 932°F. When an excursion occurs, corrective action will be initiated, documented, and reported.

These selected indicator ranges are based on the following:

- Engineering assessments and manufacturer's recommendations in accordance with 40 CFR 64.4(c)(1);
- Emissions, SCR catalyst bed temperature, and the urea/ammonia injection rate measured and recorded during performance testing in accordance with 40 CFR 64.4(c)(1); and
- The level of the measured emissions relative to the compliance limitation in accordance with 60 CFR 64.3(c).

The temperature range was specified by the manufacturer's operating instructions and verified through performance testing. The last five years of annual performance test data are available in Attachment 1. Attachment 1 provides the carbon monoxide and formaldehyde emission rates, the percent these emission rates were below the permitted emission limit, the catalyst bed temperature during the performance tests. These tests show that carbon monoxide and formaldehyde emissions are controlled to below the permitted limit for each engine when catalyst bed temperature is maintained within the indicator range.

IV. Excursion Reporting

Semiannual excursion reports will be submitted in accordance with 40 CFR § 64.9. These reports will include:

- The number, duration, and cause of excursions or exceedances, and the corrective actions taken
- The number, duration, and cause of monitor downtime incidents

V. Testing Schedule

Each compliance test will be conducted on an annual basis with no more than one year and 90 days between compliance tests per the requirements of Section VI.A.4.a. of the permit.

VI. Implementation Plan

The monitoring described in this plan will be implemented upon the issuance of the renewal of the Western 102 Class I Operating Permit per 40 CFR § 64.7(a).

REFERENCES

1. U.S. EPA. 1998. Technical Guidance Document: Compliance Assurance Monitoring, Revised Draft. For U. S. Environmental Protection Agency Office of Air Quality Planning and Standards Emission Measurement Center. MRI Project No. 4701-05. August 1998.

2. U.S. EPA. 2005. CAM Guidance Document Appendix B REVISED. For U. S. Environmental Protection Agency Office of Air Quality Planning and Standards Emission Measurement Center. MRI Project No. 4701-05. January 2005.

Attachment 1

Performance Test Data and CAM Indicator Readings and Ranges

Table 1.1
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.001	SCR System	Temperature:	NO_X	11/23/2005	0.92	1.49	62%	732	5.8
	Wartsila Engine #1		500 - 932 °F	NO_X	7/17/2007	1.24	1.49	83%	735	7.5
			Ammonia:	NO_X	5/29/2008	1.19	1.49	80%	746	7.2
			1.6 - 13.2 gal/hr	NO_X	5/12/2009	1.25	1.49	84%	723	5.6
				NO_X	6/8/2010	1.24	1.49	83%	748	5.8
		Catalytic Oxidizer	Temperature:	CO	11/23/2005	0.47	2.42	19%	732	
			500 - 932 °F	CO	7/17/2007	0.01	2.42	0.4%	735	
				CO	5/29/2008	0.12	2.42	5%	746	
				CO	5/12/2009	0.12	2.42	5%	723	
				CO	6/8/2010	0.13	2.42	5%	748	
				HCHO	11/23/2005	0.01	0.35	2%	732	
				HCHO	7/17/2007	0.01	0.35	1%	735	
				HCHO	5/29/2008	0.02	0.35	6%	746	
				HCHO	5/12/2009	0.02	0.35	6%	723	
				HCHO	6/8/2010	0.01	0.35	3%	748	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.2
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.002	SCR System	Temperature:	NO_X	11/22/2005	0.94	1.49	63%	718	6.0
	Wartsila Engine #2		500 - 932 °F	NO_X	7/18/2007	1.16	1.49	78%	737	5.6
			Ammonia:	NO_X	5/29/2008	1.00	1.49	67%	749	5.9
			1.6 - 13.2 gal/hr	NO_X	5/12/2009	0.89	1.49	60%	722	6.1
				NO_X	6/8/2010	1.16	1.49	78%	727	6.0
		Catalytic Oxidizer	Temperature:	CO	11/22/2005	0.32	2.42	13%	718	
			500 - 932 °F	CO	7/18/2007	0.01	2.42	0.4%	737	
				CO	5/29/2008	0.17	2.42	7%	749	
				CO	5/12/2009	0.19	2.42	8%	722	
				CO	6/8/2010	0.23	2.42	10%	727	
				HCHO	11/22/2005	0.01	0.35	2%	718	
				HCHO	7/18/2007	0.00	0.35	1%	737	
				HCHO	5/29/2008	0.02	0.35	6%	749	
				HCHO	5/12/2009	0.01	0.35	3%	722	
				HCHO	6/8/2010	0.01	0.35	3%	727	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.3
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.003	SCR System	Temperature:	NO_X	11/22/2005	0.64	1.49	43%	745	5.1
	Wartsila Engine #3		500 - 932 °F	NO_X	8/30/2007	1.18	1.49	79%	736	7.9
			Ammonia:	NO_X	5/30/2008	1.25	1.49	84%	754	8.2
			1.6 - 13.2 gal/hr	NO_X	5/13/2009	1.17	1.49	79%	724	4.8
				NO_X	6/9/2010	0.79	1.49	53%	721	5.1
		Catalytic Oxidizer	Temperature:	CO	11/22/2005	0.21	2.42	9%	745	
			500 - 932 °F	CO	7/17/2007	0.02	2.42	0.8%	736	
				CO	5/30/2008	0.19	2.42	8%	754	
				CO	5/13/2009	0.33	2.42	14%	724	
				CO	6/9/2010	0.32	2.42	13%	721	
				HCHO	11/22/2005	0.01	0.35	3%	745	
				HCHO	7/17/2007	0.01	0.35	1%	736	
				HCHO	5/30/2008	0.02	0.35	6%	754	
				HCHO	5/13/2009	0.01	0.35	3%	724	
				HCHO	6/9/2010	0.01	0.35	3%	721	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.4
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.004	SCR System	Temperature:	NO_X	10/21/2005	1.00	1.49	67%	726	6.0
	Wartsila Engine #4		500 - 932 °F	NO_X	8/30/2007	1.36	1.49	91%	743	8.7
			Ammonia:	NO_X	6/2/2008	1.40	1.49	94%	734	6.5
			1.6 - 13.2 gal/hr	NO_X	5/15/2009	1.31	1.49	88%	742	6.1
				NO_X	6/11/2010	1.19	1.49	80%	725	6.0
		Catalytic Oxidizer	Temperature:	CO	10/21/2005	0.10	2.42	4%	726	
			500 - 932 °F	CO	7/16/2007	0.01	2.42	0.4%	743	
				CO	6/2/2008	0.11	2.42	5%	734	
				CO	5/15/2009	0.14	2.42	6%	742	
				CO	6/11/2010	0.23	2.42	10%	725	
				HCHO	10/21/2005	0.02	0.35	7%	726	
				HCHO	7/16/2007	0.01	0.35	1%	743	
				HCHO	6/2/2008	0.02	0.35	6%	734	
				HCHO	5/15/2009	0.03	0.35	9%	742	
				HCHO	6/11/2010	0.01	0.35	3%	725	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.5
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.005	SCR System	Temperature:	NO_X	10/21/2005	1.00	1.49	67%	723	6.4
	Wartsila Engine #5		500 - 932 °F	NO_X	8/29/2007	1.17	1.49	79%	760	10.5
			Ammonia:	NO_X	6/2/2008	1.13	1.49	76%	731	6.1
			1.6 - 13.2 gal/hr	NO_X	5/14/2009	1.16	1.49	78%	734	7.5
				NO_X	6/11/2010	1.30	1.49	87%	717	6.4
		Catalytic Oxidizer	Temperature:	CO	10/21/2005	0.34	2.42	14%	723	
			500 - 932 °F	CO	7/16/2007	0.04	2.42	1.7%	736	
				CO	6/2/2008	0.21	2.42	9%	731	
				CO	5/14/2009	0.25	2.42	10%	734	
				CO	6/11/2010	0.34	2.42	14%	717	
				HCHO	10/21/2005	0.03	0.35	9%	723	
				HCHO	7/16/2007	0.00	0.35	1%	736	
				HCHO	6/2/2008	0.02	0.35	6%	731	
				HCHO	5/14/2009	0.04	0.35	11%	734	
				HCHO	6/11/2010	0.01	0.35	3%	717	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.6
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.006	SCR System	Temperature:	NO_X	10/21/2005	0.92	1.49	62%	724	5.0
	Wartsila Engine #6		500 - 932 °F	NO_X	8/29/2007	1.23	1.49	83%	759	8.0
			Ammonia:	NO_X	5/31/2008	1.43	1.49	96%	735	6.4
			1.6 - 13.2 gal/hr	NO_X	5/15/2009	1.09	1.49	73%	736	4.5
				NO_X	6/10/2010	1.21	1.49	81%	715	5.0
		Catalytic Oxidizer	Temperature:	CO	10/21/2005	0.26	2.42	11%	724	
			500 - 932 °F	CO	7/15/2007	0.01	2.42	0.2%	735	
				CO	5/31/2008	0.14	2.42	6%	735	
				CO	5/15/2009	0.12	2.42	5%	736	
				CO	6/10/2010	0.13	2.42	5%	715	
				HCHO	10/21/2005	0.02	0.35	5%	724	
				HCHO	7/15/2007	0.01	0.35	1%	735	
				HCHO	5/31/2008	0.02	0.35	6%	735	
				HCHO	5/15/2009	0.01	0.35	3%	736	
				HCHO	6/10/2010	0.01	0.35	3%	715	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.7
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.007	SCR System	Temperature:	NO_X	10/21/2005	1.00	1.49	67%	732	2.9
	Wartsila Engine #7		500 - 932 °F	NO_X	8/28/2007	1.07	1.49	72%	745	7.1
			Ammonia:	NO_X	5/31/2008	1.03	1.49	69%	672	5.5
			1.6 - 13.2 gal/hr	NO_X	5/14/2009	0.82	1.49	55%	692	3.1
				NO_X	6/10/2010	1.02	1.49	68%	711	2.9
		Catalytic Oxidizer	Temperature:	CO	10/21/2005	0.09	2.42	4%	732	
			500 - 932 °F	CO	7/18/2007	0.07	2.42	2.9%	735	
				CO	5/31/2008	0.15	2.42	6%	672	
				CO	5/14/2009	0.00	2.42	0%	692	
				CO	6/10/2010	0.26	2.42	11%	711	
				HCHO	10/21/2005	0.02	0.35	5%	732	
				HCHO	7/18/2007	0.01	0.35	1%	735	
				HCHO	5/31/2008	0.02	0.35	6%	672	
				HCHO	5/14/2009	0.02	0.35	6%	692	
				HCHO	6/10/2010	0.01	0.35	3%	711	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.8
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.008	SCR System	Temperature:	NO_X	10/22/2005	1.00	1.49	67%	723	4.5
	Wartsila Engine #8		500 - 932 °F	NO_X	8/31/2007	0.87	1.49	58%	757	9.1
			Ammonia:	NO_X	6/3/2008	0.79	1.49	53%	732	5.3
			1.6 - 13.2 gal/hr	NO_X	5/16/2009	0.76	1.49	51%	728	4.0
				NO_X	6/12/2010	0.99	1.49	66%	739	4.5
		Catalytic Oxidizer	Temperature:	CO	10/22/2005	0.20	2.42	8%	723	
			500 - 932 °F	CO	7/13/2007	0.00	2.42	0.1%	742	
				CO	6/3/2008	0.13	2.42	5%	732	
				CO	5/16/2009	0.20	2.42	8%	728	
				CO	6/12/2010	0.27	2.42	11%	739	
				HCHO	10/22/2005	0.03	0.35	8%	723	
				HCHO	7/13/2007	0.01	0.35	1%	742	
				HCHO	6/3/2008	0.02	0.35	6%	732	
				HCHO	5/16/2009	0.03	0.35	9%	728	
				HCHO	6/12/2010	0.02	0.35	6%	739	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.9
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.009	SCR System	Temperature:	NO_X	10/22/2005	1.10	1.49	74%	725	7.1
	Wartsila Engine #9		500 - 932 °F	NO_X	7/13/2007	1.13	1.49	76%	739	6.8
			Ammonia:	NO_X	6/3/2008	1.05	1.49	70%	742	7.7
			1.6 - 13.2 gal/hr	NO_X	5/16/2009	1.08	1.49	72%	747	6.4
				NO_X	6/12/2010	1.17	1.49	79%	749	7.1
		Catalytic Oxidizer	Temperature:	CO	10/22/2005	0.14	2.42	6%	725	
			500 - 932 °F	CO	7/13/2007	0.01	2.42	0.2%	739	
				CO	6/3/2008	0.13	2.42	5%	742	
				CO	5/16/2009	0.13	2.42	5%	747	
				CO	6/12/2010	0.13	2.42	5%	749	
				HCHO	10/22/2005	0.02	0.35	5%	725	
				HCHO	7/13/2007	0.01	0.35	1%	739	
				HCHO	6/3/2008	0.02	0.35	6%	742	
				HCHO	5/16/2009	0.01	0.35	3%	747	
				HCHO	6/12/2010	0.01	0.35	3%	749	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.10
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.010	SCR System	Temperature:	NO_X	10/23/2005	1.10	1.49	74%	726	5.2
	Wartsila Engine #10		500 - 932 °F	NO_X	7/12/2007	1.32	1.49	89%	743	8.2
			Ammonia:	NO_X	6/4/2008	1.27	1.49	85%	746	7.7
			1.6 - 13.2 gal/hr	NO_X	5/18/2009	1.11	1.49	74%	726	5.8
				NO_X	6/14/2010	1.04	1.49	70%	732	5.2
		Catalytic Oxidizer	Temperature:	CO	10/23/2005	0.15	2.42	6%	726	
			500 - 932 °F	CO	7/12/2007	0.01	2.42	0.4%	743	
				CO	6/4/2008	0.16	2.42	7%	746	
				CO	5/18/2009	0.17	2.42	7%	726	
				CO	6/14/2010	0.28	2.42	12%	732	
				HCHO	10/23/2005	0.09	0.35	25%	726	
				HCHO	7/12/2007	0.00	0.35	1%	743	
				HCHO	6/4/2008	0.02	0.35	6%	746	
				HCHO	5/18/2009	0.10	0.35	29%	726	
				HCHO	6/14/2010	0.02	0.35	6%	732	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.11
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.011	SCR System	Temperature:	NO_X	11/21/2005	0.98	1.49	66%	712	6.8
	Wartsila Engine #11		500 - 932 °F	NO_X	7/12/2007	1.29	1.49	87%	735	6.6
			Ammonia:	NO_X	6/4/2008	1.30	1.49	87%	739	6.8
			1.6 - 13.2 gal/hr	NO_X	5/18/2009	0.90	1.49	60%	738	6.3
				NO_X	6/14/2010	0.99	1.49	66%	728	6.8
		Catalytic Oxidizer	Temperature:	CO	11/21/2005	0.10	2.42	4%	712	
			500 - 932 °F	CO	7/12/2007	0.10	2.42	4.1%	735	
				CO	6/4/2008	0.16	2.42	7%	739	
				CO	5/18/2009	0.16	2.42	7%	738	
				CO	6/14/2010	0.17	2.42	7%	728	
				HCHO	11/21/2005	0.02	0.35	5%	712	
				HCHO	7/12/2007	0.01	0.35	1%	735	
				HCHO	6/4/2008	0.02	0.35	6%	739	
				HCHO	5/18/2009	0.06	0.35	17%	738	
				HCHO	6/14/2010	0.04	0.35	11%	728	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.12
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.012	SCR System	Temperature:	NO_X	11/20/2005	0.68	1.49	46%	708	6.1
	Wartsila Engine #12		500 - 932 °F	NO_X	7/10/2007	1.42	1.49	95%	739	6.6
			Ammonia:	NO_X	6/5/2008	1.30	1.49	87%	729	8.0
			1.6 - 13.2 gal/hr	NO_X	5/18/2009	1.09	1.49	73%	721	6.3
				NO_X	6/15/2010	0.88	1.49	59%	714	6.1
		Catalytic Oxidizer	Temperature:	CO	11/20/2005	0.24	2.42	10%	708	
			500 - 932 °F	CO	7/10/2007	0.01	2.42	0.4%	739	
				CO	6/5/2008	0.26	2.42	11%	729	
				CO	5/18/2009	0.26	2.42	11%	721	
				CO	6/15/2010	0.29	2.42	12%	714	
				HCHO	11/20/2005	0.00	0.35	1%	708	
				HCHO	7/10/2007	0.00	0.35	1%	739	
				HCHO	6/5/2008	0.02	0.35	6%	729	
				HCHO	5/18/2009	0.02	0.35	6%	721	
				HCHO	6/15/2010	0.02	0.35	6%	714	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.13
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.013	SCR System	Temperature:	NO_X	11/20/2005	1.10	1.49	74%	717	8.0
	Wartsila Engine #13		500 - 932 °F	NO_X	7/11/2007	0.92	1.49	62%	739	6.4
			Ammonia:	NO_X	6/5/2008	1.41	1.49	95%	743	8.2
			1.6 - 13.2 gal/hr	NO_X	5/18/2009	0.89	1.49	60%	739	5.7
				NO_X	6/15/2010	1.11	1.49	74%	736	8.0
		Catalytic Oxidizer	Temperature:	CO	11/20/2005	0.30	2.42	12%	717	
			500 - 932 °F	CO	7/11/2007	0.01	2.42	0.4%	739	
				CO	6/5/2008	0.15	2.42	6%	743	
				CO	5/18/2009	0.12	2.42	5%	739	
				CO	6/15/2010	0.13	2.42	5%	736	
				HCHO	11/20/2005	0.01	0.35	2%	717	
				HCHO	7/11/2007	0.00	0.35	1%	739	
				HCHO	6/5/2008	0.02	0.35	6%	743	
				HCHO	5/18/2009	0.05	0.35	14%	739	
				HCHO	6/15/2010	0.03	0.35	9%	736	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.

Table 1.14
CAM Indicator Readings During Stack Tests

Sys No.	Emission Unit	Control Device	Indicator Range	Pollutant Controlled	Test Date	Emission Test lb/hr	Emission Pmt Limit lb/hr	% of Pmt Limit	Temp.* °F	Ammonia gal/hr
1	S2.014	SCR System	Temperature:	NO_X	11/21/2005	0.86	1.49	58%	736	6.5
	Wartsila Engine #14		500 - 932 °F	NO_X	7/11/2007	1.19	1.49	80%	735	7.1
			Ammonia:	NO_X	6/5/2008	1.21	1.49	81%	737	5.7
			1.6 - 13.2 gal/hr	NO_X	5/19/2009	1.28	1.49	86%	709	5.1
				NO_X	6/15/2010	1.25	1.49	84%	708	6.4
		Catalytic Oxidizer	Temperature:	CO	11/21/2005	0.15	2.42	6%	736	
			500 - 932 °F	CO	7/11/2007	0.10	2.42	4.1%	735	
				CO	6/5/2008	0.26	2.42	11%	737	
				CO	5/19/2009	0.25	2.42	10%	709	
				CO	6/15/2010	0.36	2.42	15%	708	
				HCHO	11/21/2005	0.01	0.35	3%	736	
				HCHO	7/11/2007	0.00	0.35	1%	735	
				HCHO	6/5/2008	0.02	0.35	6%	737	
				HCHO	5/19/2009	0.10	0.35	29%	709	
				HCHO	6/15/2010	0.02	0.35	6%	708	
								Range:	**500 - 932**	**1.6 - 13.2**

* Stack temperature is used in lieu of catalyst temperature because there was no requirement to record the temperature of the catalyst.