Eagle Mountain Scientific, Inc.

Eagle Mountain Scientific Inc.

Results of the Compliance Test for Particulates as PM-10 and Opacity

Test Location:
Gerdau Ameristeel
Old Baghouse (EU001, CE001)
1678 Red Rock Rd.
St. Paul, MN 55119

MPCA Permit File #12300055-11

Prepared for:

Mr. Doug Stolowski
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Report # 902334 (Old)
November 8, 2006

Prepared By:

Brian Durkop

Brian Durkop
Vice President

REPORT CERTIFICATIONS

1.) **Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**
"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian Durkop Print Name: Brian Durkop
Title: Vice President Date: 12-21-06

2.) **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**
"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark Carlson Print Name: Mark Carlson
Title: Field Supervisor Date: 12-21-06

3.) **Certification of test report by senior staff person at the testing company who is responsible for compiling and checking the test report:**
"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian Durkop Print Name: Brian Durkop
Title: Vice President Date: 12-21-06

4.) **Certification of test report by owner or operator of the emission facility:**
"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: Douglas Stoltenberg Print Name: Douglas Stoltenberg
Title: Environmental Manager Date: 12/21/06

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SECTION 1.0

EXECUTIVE SUMMARY

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Gerdau Ameristeel facility located in St. Paul, Minnesota. The test was performed on November 8, 2006 to quantify particulate matter (to be reported as PM-10) and visible emissions from the Old Baghouse (AAF) (EU001, CE001). The purpose of the test was to meet the requirements set forth in the Gerdau Ameristeel Permit to Operate (151-93-OT-2). EMSI conducted U. S. EPA (EPA) and Minnesota Pollution Control Agency (MPCA) approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

The testing was performed by Mr. Brian Durkop, Mr. James Wilson, and Mr. Nathan traut. There were no MPCA observers present during this test project. The process operating conditions were recorded by Gerdau Ameristeel plant personnel and EMSI.

1.1 Summary of Test Methods

Table 1.1
Gerdau Ameristeel - Old Baghouse
(EU001, CE001)
November 8, 2006

METHOD	PURPOSE	RUN TIME	# OF RUNS
EPA 1	Determination of Traverse Points	NA	1
EPA 2	Determination of Velocity and Volumetric Flow	108 minutes	3
EPA 3	Determination of Molecular Weight	108 minutes	3
EPA 4	Determination of Moisture	108 minutes	3
EPA 5D	Determination of Particulate Matter	108 minutes	3
EPA 9	Determination of Opacity	60 minutes	1
EPA 202	Determination of Condensable Particulate Matter	NA	3

1.2 Summary of Test Results

Table 1.2
Gerdau Ameristeel - Old Baghouse
(EU001, CE001)
November 8, 2006

POLLUTANT	RUN 1	RUN 2	RUN 3	AVERAGE	LIMIT	REGULATION
PM-10 (gr/dscf)	0.0034	0.0030	0.0033	0.0033	0.0052	See Footnote 1
Opacity (%)	0	NA	NA	0	3	40 CFR 60.272a

Footnote 1 – Limit emissions to those used for netting calculations.

1.3 Summary of Production

Table 1.3
Gerdau Ameristeel - Old Baghouse
(EU001, CE001)
Particulates As PM10
November 8, 2006

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Production (tons/hr)	84.4	84.4	84.4	84.4

1.4 Summary of Report Organization

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectfully: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations and opacity certification, and the test plan.

SECTION 2.0

TEST RESULTS

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA. A copy of the test plan and approval letter are located in Appendix F.

2.1 Particulates

The results of the three tests performed for the determination of particulate matter with condensables are reported in Table 2.1. The ladle refining station operates on a batch process, so to achieve a worst case-operating scenario, between heats when the process is down sampling was stopped.

Table 2.1
Gerdau Ameristeel - Old Baghouse
(EU001, CE001)
Particulate Test Results
November 8, 2006

Client: *Gerdau Ameristeel* **Plant:** *St. Paul*
Date(s): *November 8, 2006* **EPA Method(s):** *1-5D, 202*

Run #:	Run 1	Run 2	Run 3	
Date:	11/8/2006	11/8/2006	11/8/2006	
Time:	9:54-12:32	13:28-16:14	16:36-18:33	Average
Production				
Steel (tons/hr)	84.4	84.4	84.4	84.4
Control Equipment (monovent baghouse)				
DP #1 (inH20)	5.32	5.39	5.47	5.39
DP #2 (inH20)	4.75	4.37	4.90	4.67
DP #3 (inH20)	5.69	5.30	6.05	5.68
DP #4 (inH20)	5.34	4.49	4.82	4.88
DP #5 (inH20)	5.71	5.72	5.90	5.78
DP #6 (inH20)	4.73	4.64	5.21	4.86
DP #7 (inH20)	5.17	5.11	5.66	5.31
DP #8 (inH20)	5.79	5.53	5.81	5.71
DP #9 (inH20)	4.53	4.81	4.76	4.70
DP #10 (inH20)	5.40	5.07	6.11	5.53
DP #11 (inH20)	5.08	4.50	5.49	5.02
DP #12 (inH20)	4.77	4.94	5.01	4.91
Fans #1 (Amps)	108.0	108.0	108.0	108.0
Fans #2 (Amps)	118.0	118.0	118.0	118.0
Duct Conditions				
Stack Temp (°F)	117	135	123	125
Oxygen (%)	20.9	20.9	20.8	20.9
Carbon Dioxide (%)	0.3	0.3	0.3	0.3
Moisture (%)	1.9	1.9	1.9	1.9
Mol Weight, Dry	28.8	28.8	28.8	28.8
Stack Press (inH20)	-8.00	-8.00	-8.00	-8.00

Stack Area (ft2)	70.85	70.85	70.85	70.85
Stack Vel (ft/sec)	50.1	49.9	48.6	49.5
Stack Flow (wacfm)	212,981	212,276	206,453	210,570
Stack Flow (wscfm)	186,298	179,834	178,595	181,576
Stack Flow (dscfm)	182,758	176,417	175,201	178,125
Baghouse Conditions				
Nozzle (inches)	1.470	1.470	1.470	1.470
Stack Temp (°F)	119	131	135	128
Oxygen (%)	20.9	20.9	20.9	20.9
Carbon Dioxide (%)	0.3	0.3	0.3	0.3
Moisture (%)	1.4	1.3	1.4	1.4
Mol Weight, Dry	28.9	28.9	28.9	28.9
Stack Press (inH20)	0.04	0.04	0.04	0.04
Stack Area (ft2)	3374.92	3374.92	3374.92	3374.92
Stack Vel (ft/sec)	1.1	1.0	1.1	1.1
Stack Flow (wacfm)	218,675	207,082	214,514	213,424
Stack Flow (wscfm)	195,959	181,777	187,632	188,456
Stack Flow (dscfm)	193,197	179,399	185,044	185,880
Test Results - Total Particulate Matter				
Sample Gas Vol (dscf)	73.888	67.959	70.774	70.873
Isokinetics (%)	101.4	100.4	101.4	101.1
Filter (mg)	1.2	0.0	0.1	0.4
Probe Rinse (mg)	7.6	7.8	9.0	8.1
Aqueous (mg)	6.5	4.5	4.6	5.2
Organic (mg)	1.2	1.1	1.5	1.3
Total (mg)	16.5	13.4	15.2	15.0
Filterable (lbs/hr)	3.043	2.723	3.147	2.971
Aqueous (lbs/hr)	2.248	1.571	1.591	1.803
Organic (lbs/hr)	0.415	0.384	0.519	0.439
Total (lbs/hr)	5.706	4.678	5.256	5.214
Filterable (gr/dscf)	0.0018	0.0018	0.0020	0.0019
Aqueous (gr/dscf)	0.0014	0.0010	0.0010	0.0011
Organic (gr/dscf)	0.0003	0.0002	0.0003	0.0003
Total (gr/dscf)	0.0034	0.0030	0.0033	0.0033

2.2 Opacity

Mr. James Wilson conducted the visible emission observations. Eastern Technical Asssoceates certified Mr. Wilson. A copy of his current certification certificate is located in Appendix E.

Table 2.2
Gerdau Ameristeel - Old Baghouse
Opacity Test Results
November 8, 2006

Client: *Gerdau Ameristeel* **Plant:** *St. Paul*
Date(s): *November 8, 2006* **EPA Method(s):** *9*

Run #:	Run 1	
Date:	11-08-06	
Time:	16:29-17:29	Average
Production		
Steel (tons/hr)	84.4	84.4
Test Results – Opacity		
Max 6-min Avg (%)	0.00	0.00
Avg. Opacity (%)	0.00	0.00
Max. Reading (%)	0.00	0.00
Min. Reading (%)	0.00	0.00
# of Reading > 20%	0	0
# of Readings	240	240

SECTION 3.0

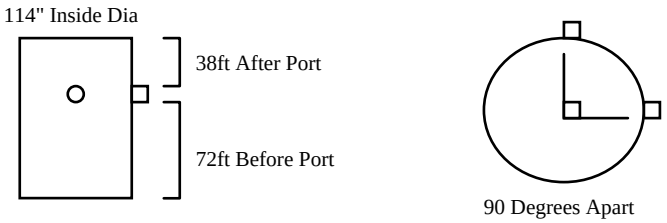
TEST PROCEDURES

3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

Inlet Duct

Number of Ports:	2
Inside Diameter:	114 inches
Area:	70.85 cubic feet
Distance Upstream of Ports:	72 feet
Distance Downstream of Ports:	38 feet
Total Number of Points:	16
Number of Points per Diameter:	8
Average Cyclonic Flow:	0 %



Point 1	3.6	inches
Point 2	12.0	inches
Point 3	22.1	inches
Point 4	36.8	inches
Point 5	77.2	inches
Point 6	91.9	inches
Point 7	102.0	inches
Point 8	110.4	inches

Baghouse (Outlet)

Each compartment was divided into a 3 x 3 matrix for a total number of points for each compartment being 9. Run 1 sampled at points 1-3 in each of the twelve compartments for a total of 36 points. Run 2 followed by sampling at 4-6 in each compartment, and finally Run 3 sampled at points 7-9.

Sample Matrix

3x3	3x3	3x3	3x3	3x3	3x3
3x3	3x3	3x3	3x3	3x3	3x3

Number of Compartments: 12
Total Area of Baghouse: 3374.92 cubic feet
Total Number of Points: 108
Number of Points Per Run: 36
Run 1 points: 1 to 3 in twelve compartments
Run 2 points: 4 to 6 in twelve compartments
Run 3 points: 7 to 9 in twelve compartments

Baghouse Dimensions

Compartment Number	Compartment Depth	Compartment Width	Number of Doors	Compartment Area (ft2)
1	25'7"	11'0"	1	281.417
2	25'7"	11'0"	1	281.417
3	25'7"	11'0"	1	281.417
4	25'7"	11'0"	1	281.417
5	25'7"	11'0"	1	281.417
6	25'7"	11'0"	1	281.417
7	25'7"	11'0"	1	281.417
8	25'7"	11'0"	1	281.417
9	25'7"	11'0"	1	281.417
10	25'7"	11'0"	1	281.417
11	25'7"	11'0"	1	281.417
12	25'7"	11'0"	1	281.417
Total Baghouse Exhaust Area				3,377.004[1]

[1]The true area is 3374.92 square feet due to obstructions in the compartments.

3.2 Determination of Particulate Matter

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 2-5D
Code of Federal Regulations, Title 40, Part 51, Appendix M, Methods 202

Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a glass fiber filter. The exit to the filter holder was connected to the impinger train which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample.

Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of 250 ±25°F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

Sample Recovery

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of: the nozzle, the probe liner; and the front half of the filter holder. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a labeled, clean polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impingers were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch and rinses of the impingers and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.

At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of containers as were used for sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tared beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weighings agreed to within 0.5 mg.

Prior to analysis, back half fraction and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride or chloroform/ether and analyzed gravimetrically. Each sample was extracted three times with 200 ml methylene chloride in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic (solvent) and aqueous (water) fractions were placed in individual tared beakers. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point. After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weighings agreed to within 0.5 mg.

3.3 Determination of Opacity

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9

Positioning of the observer

The opacity of the plume as viewed by the observer can be influenced due to several variables with respect the position of the observer. The position of the observer with respect to the sun. Position of the observer with respect to the observation point. Attached or detached steam plumes. Position of the observer with respect to a rectangular stack with high length to width ratios.

The acceptable criteria for the position the observer is outlined in Method 9 as follows:

1) The observer must maintain a position with the sun located at a 140° arc to the observers back.

2) The observer must maintain an angle of <18° with respect to the observation point.

3) The observer must read the opacity where a steam plume does not interfere. Between the stack and the steam plume if the steam plume in detached from the stack. After the steam plume if the steam plume is attached from the stack.

4) The observer must read a rectangular stack at a point where the stack has the shortest cross sectional diameter.

Visible Emission Readings

A test for visible emission requires 480 consecutive reading. Each reading is recorded in 15-second intervals for 60-minutes. The percent opacity is recorded in 5 percent increments for 0 to 100. The observer must record the results on a data sheet as outlined in Method 9. (ie. position of the observer, date, time, process information, location of the stack, and the 15-second opacity readings). The determination of opacity is calculated using a 6-minute rolling average.

Appendix A

Field Data Sheets

Eagle Mountain Scientific Inc.

VELOCITY TRAVERSE DATA SHEET

Client:	Gerdau Ameristeel	Date:	11-9-06	Facility:	St.Paul
Job Number:		Unit:	Old	Operator(s):	SW-BD
Location:	Inlet	Fuel Type:			
Test Number:	one 1	Stack O_2 (%):	20.8		
Barometric Pressure: (in. Hg)	29.42	Stack O_2 (%):	0.3		
Stack Pressure(Ps) (in. H2O):	-4.3	Test Description:	Flow		
Pitot Tube Coefficient (Cp):	.84		ΔH=1.733		

Traverse Point		Time	ΔP (in.H_2O)	T_s(EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
H	1	830	.56	93		
	2		.62	95		
	3		.55	95		
	4		.50	95		
	5		.85	115		
	6		.90	112		
	7		.87	112		
	8		1.0	118		
V	1		.74	99		
	2		.82	105		
	3		.95	115		
	4		1.05	116	0.00033	OP
	5		.94	116	1.470	Nozzle
	6		.85	115	1.46	ΔH
	7		.55	113		
	8	841	.55	114		

$V_S=85.48\ C_P \sqrt{\frac{(T_S + 460)\ \Delta P}{(P_S/13.6 + P_{BAR})\ M_{fg}}}$ $\quad M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$

1.23 DH

Eagle Mountain Scientific Inc.

VELOCITY TRAVERSE DATA SHEET

Client:	Gerdau Ameristeel	Date:	11-8-06	Facility:	St.Paul
Job Number:		Unit:	Old	Operator(s):	DW/TSD
Location:	Inlet	Fuel Type:			
Test Number:	2	Stack O_2 (%):	20.8		
Barometric Pressure: (in. Hg)	29.42	Stack O_2 (%):	0.3		
Stack Pressure(Ps) (in. H2O):	-5.4	Test Description:	Flow		
Pitot Tube Coefficient (Cp):	.84				

Traverse Point		Time	ΔP (in.H_2O)	T_s(EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
	1	1300	.60	86		
	2		.72	87		
	3		.90	108		
	4		.98	125		
	5		.88	125	0.00029	ΔP
	6		.84	125	1.470	WO22K
	7		.55	120	1.23	ΔH
	8		.50	119		
	1		.55	75		
	2		.58	79		
	3		.57	84		
	4		.50	122		
	5		.77	125		
	6		.80	125		
	7		.83	125		
	8	1314	.85	124		

$V_S = 85.48\ C_P \sqrt{\frac{(T_S + 460)\ \Delta P}{(P_S/13.6 + P_{BAR})\ M_{fg}}}$

$M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$

DP - .00031

DH - 1.32

Eagle Mountain Scientific Inc

VELOCITY TRAVERSE DATA SHEET

Client:	Gerdau Ameristeel	Date:	11-8-06	Facility:	St.Paul
Job Number:		Unit:	Old	Operator(s):	SW-BD
Location:	Inlet	Fuel Type:			
Test Number:	5	Stack O_2 (%):	20.8		
Barometric Pressure: (in. Hg)	29.46	Stack O_2 (%):	0.5		
Stack Pressure(Ps) (in. H2O):	-6.1	Test Description:	Flow		
Pitot Tube Coefficient (Cp):	.84				

Traverse Point		Time	ΔP (in.H_2O)	T_s(EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
U	1	1245	.72	89		
	2		.85	89		
	3		.94	95		
	4		1.0	115		
	5		.95	120		
	6		.86	120		
	7		.56	121		
	8		.54	120		
L	1		.55	100		
	2		.61	113		
	3		.65	118		
	4		.53	118		
	5		.79	118		
	6		.85	118		
	7		.87	118		
	8	1256	.85	118		

$V_S = 85.48\ C_P \sqrt{\frac{(T_S + 460)\ \Delta P}{(P_S/13.6 + P_{BAR})\ M_{fg}}}$

$M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	1	Job #	
Unit	Old Baghouse	Description	TSP	Page	1 of 3
Location	Stack	Start/Stop Time	954 - 1232	Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	3010-5	Impinger	MATERIAL WEIGHT (g) End	Start	Dif.	Leak Check	CFM	VAC.	INIT	TIME
Pbar	29.42	In Hg	Nozzle Dia. (in)	1.470	#1	751.3	730.6		Pre-Test	0	7	BD	806
K-Factor			Filter #	TSP-85	#2	687.8	682.3		Post-Test	0	8	BD	1235
Mol. WT		g/mole	del H @	1.733	#3	615.1	613.0		Run	1	2	3	Avg.
Pstack		In H2O	Meter Factor	0.941	#4	767.7	753.10		O2	20.9			
Sample Time	108	min	Pitot Coeff.	0.84	Total				CO2	0.3			

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		0			96.955								
1	1	3	0.00033	1.46	99.2	4	99	242	258	62	67	65	
	2	6			101.2	3	99	246	253	63	67	65	
	3	9			103.1	4	99	248	245	62	68	65	
2	1	12			105.45	4	106	248	247	60	68	66	
	2	15			107.65	4	109	249	251	60	69	66	
	3	18			109.935	4	111	249	250	58	70	66	
3	1	21			112.05	4	115	248	252	57	70	67	1037-1055
	2	24			114.35	4	110	247	251	56	72	70	Delay 30 min
	3	27			116.65	4	115	248	250	58	72	70	No Heat Ready
4	1	30			118.75	4	122	247	248	59	72	70	
	2	33			120.85	4	123	248	250	59	72	70	
	3	36			123.11	4	122	247	250	59	73	70	
Total/Avg.		36											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	1	Job #	
Unit	Old Baghouse	Description	TSP	Page	2 of 3
Location	Stack	Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb	°F	Meter Box #	2010-5	Impinger	
Pbar	In Hg	Nozzle Dia. (in)		#1	
K-Factor		Filter #		#2	
Mol. WT	g/mole	del H @		#3	
Pstack	In H2O	Meter Factor		#4	
Sample Time	min	Pitot Coeff.		Total	

MATERIAL WEIGHT (g)

	End	Start	Dif.
Pre-Test			
Post-Test			
Run			
O2			
CO2			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

	1	2	3	Avg.

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		36			123.24		122						
5	1	39	0.00033	1.46	125.3	4	~~250~~	250	248	59	72	71	
	2	42			127.7	4	122	248	250	58	73	70	
	3	45			129.862	4	125	249	250	59	73	71	
6	1	48			132.1	4	128	249	249	57	73	71	
	2	51			134.2	4	130	249	249	56	73	71	
	3	54			135.540	4	125	249	251	57	73	71	
7	1	57			138.750	4	128	249	250	56	73	71	
	2	60			141.0	4	127	253	250	55	72	71	
	3	63			143.25	4	124	252	247	56	73	71	
8	1	66			145.3	4	123	254	248	56	73	71	
	2	69			147.8	4	125	254	249	57	73	71	
	3	72			150.001	4	126	251	250	57	73	71	
Total/Avg.		72											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	1	Job #	
Unit	Old Baghouse	Description	TSP	Page	3 of 3
Location	Stack	Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb	°F	Meter Box #	2010-5	Impinger	End	Start	Dif.
Pbar	In Hg	Nozzle Dia. (in)		#1			
K-Factor		Filter #		#2			
Mol. WT	g/mole	del H @		#3			
Pstack	In H2O	Meter Factor		#4			
Sample Time	min	Pitot Coeff.		Total			

MATERIAL WEIGHT (g)

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		72			150.001								
9	1	75	0.00033	1.46	152.2	4	125	250	250	62	73	71	
	2	78			154.5	4	125	243	250	60	73	71	
	3	81			156.75	4	124	243	250	60	73	71	
10	1	84			158.9	4	120	242	249	58	73	71	
	2	87			161.2	4	117	244	249	57	73	71	
	3	90			163.428	4	117	245	249	58	73	71	
11	1	93			165.70	4	120	246	249	59	73	71	
	2	96			168.0	4	122	247	249	60	73	71	
	3	99			170.235	4	122	247	248	58	73	71	
12	1	102			172.4	4	123	248	249	57	73	71	
	2	105			174.7	4	125	248	250	55	73	71	
	3	108			176.955	4	123	247	251	56	73	71	
Total/Avg.		108											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06		
Facility	St.Paul	Test Number	2	Job #			
Unit	Old Baghouse	Description	TSP	Page	1	of	3
Location	Stack	Start/Stop Time	1328-1614	Operator	BD		

PRE-TEST DATA

Tamb		°F	Meter Box #	2010-5	Impinger	End	Start	Dif.
Pbar	29.42	In Hg	Nozzle Dia. (in)	1.470	#1	713.7	713.5	
K-Factor			Filter #	TSP-82	#2	755.8	751.0	
Mol. WT		g/mole	del H @	1.733	#3	594.5	593.3	
Pstack		In H2O	Meter Factor	0.941	#4	769.0	756.4	
Sample Time	108	min	Pitot Coeff.	0.84	Total			

MATERIAL WEIGHT (g)

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test	0	7	30	1241
Post-Test				

Run	1	2	3	Avg.
O2	20.9			
CO2	0.3			

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		0			77.333								
1	4	3	0.00029	1.23	79.6	3	110	247	251	59	73	73	
	5	6			82.0	3	124	248	252	56	75	76	Delay
	6	9			84.478	3	112	251	251	55	80	77	
2	4	12			86.2	3	130	250	250	56	80	78	
	5	15			88.3	3	132	249	249	55	80	78	
	6	18			90.4	3	132	244	251	55	81	78	
3	4	21			92.5	3	135	250	250	56	81	79	
	5	24			94.6	3	136	251	248	55	81	79	
	6	27			96.748	3	134	246	249	56	81	79	
4	4	30			98.1	3	134	249	252	54	81	79	
	5	33			100.8	3	133	249	250	55	81	79	
	6	36			102.612	3	132	249	249	54	81	79	
Total/Avg.		36											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	2	Job #	
Unit	Old Baghouse	Description	TSP	Page	2 of 3
Location	Stack	Start/Stop Time		Operator	RD

PRE-TEST DATA

Tamb	°F	Meter Box #	2010-5	Impinger	
Pbar	In Hg	Nozzle Dia. (in)		#1	
K-Factor		Filter #		#2	
Mol. WT	g/mole	del H @		#3	
Pstack	In H2O	Meter Factor		#4	
Sample Time	min	Pitot Coeff.		Total	

MATERIAL WEIGHT (g)

	End	Start	Dif.
Pre-Test			
Post-Test			
Run			
O2			
CO2			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

	1	2	3	Avg.

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		36			103.612								
5	4	39	0.00029	1.23	105.2	4	130	249	250	58	82	80	
	5	42			107.6	4	130	251	251	60	82	80	
	6	45			109.00	4	132	251	250	55	82	80	
6	4	48			111.20	4	133	250	249	55	82	80	
	5	51			113.2	4	133	251	250	54	82	80	
	6	54			115.2	4	133	250	249	54	82	80	
7	4	57			117.3	4	132	251	250	54	83	81	
	5	60			119.4	4	132	251	250	54	83	81	
	6	63			121.7	4	131	250	251	54	83	81	
8	4	66			123.5	4	130	250	248	56	85	82	
	5	69			125.7	4	130	251	246	57	85	82	
	6	72			127.960	4	133	244	251	57	85	82	
Total/Avg.		72											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	2	Job #	
Unit	Old Baghouse	Description	TSP	Page	3 of 3
Location	Stack	Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #		
Pbar		In Hg	Nozzle Dia. (in)		
K-Factor			Filter #		
Mol. WT		g/mole	del H @		
Pstack		In H2O	Meter Factor		
Sample Time		min	Pitot Coeff.		

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
							Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
		72			127.666								
9	4	75	0.00029	1.23	1300	4	132	251	246	59	86	84	
	5	78			131.8	4	133	250	247	58	86	84	
	6	81			133.910	4	134	251	248	55	86	84	
10	4	84			136.0	4	133	250	249	54	87	85	
	5	87			138.3	4	136	244	249	53	87	85	
	6	90			140.1	4	135	246	250	53	87	85	
11	4	93			142.2	4	134	247	249	54	87	85	
	5	96			144.4	4	134	248	248	54	86	86	
	6	99			146.31	4	134	247	248	54	86	85	
12	4	102			148.8	4	135	246	248	56	86	85	
	5	105			150.5	4	134	246	247	56	85	85	
	6	108			152.511	4	134	247	248	58	85	85	
Total/Avg.		108											

Chuck
612 716 0971

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	3	Job #	
Unit	Old Baghouse	Description	TSP	Page	1 of 3
Location	Stack	Start/Stop Time	1636 - 1833	Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	2006-5	Impinger		
Pbar	29.47	In Hg	Nozzle Dia. (in)	1.470	#1		
K-Factor			Filter #		#2		
Mol. WT		g/mole	del H @	1.733	#3		
Pstack		In H2O	Meter Factor	0.941	#4	78.1	
Sample Time	108	min	Pitot Coeff.	0.84	Total		

MATERIAL WEIGHT (g)

	End	Start	Dif.
Pre-Test	716.3	715.0	
Post-Test	719.6	715.7	
Run	612.1	611.0	
O2	781	723.4	
CO2			

Leak Check

	CFM	VAC.	INIT	TIME
Pre-Test	0	10	1BD	1630
Post-Test	0	13	5	1836

	1	2	3 Avg.
O2	20.9		
CO2	0.3		

Sample Point	Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
	0		1.32	52.884								
1 - 7	3	0.00031		54.9	4	128	251	249	59	85	84	
8	6			57.15	4	127	250	250	58	85	84	
9	9			59.337	4	126	251	249	56	85	84	
2 - 7	12			61.6	4	126	250	248	56	84	83	
8	15			63.7	4	128	251	249	55	83	83	
9	18			65.77	4	128	251	248	54	84	83	
3 - 7	21			67.9	4	129	250	249	56	84	83	
8	24			70.2	4	131	250	248	55	84	83	
9	27			72.2	4	130	250	249	56	85	83	
4 - 7	30			74.4	4	132	250	245	55	85	83	
8	33			76.6	4	129	251	247	56	85	84	
9	36			78.770	4	124	252	248	56	86	84	
Total/Avg.	36											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	3	Job #	
Unit	Old Baghouse	Description	TSP	Page	2 of 3
Location	Stack	Start/Stop Time		Operator	RD

PRE-TEST DATA

Tamb	°F	Meter Box #		Impinger	
Pbar	In Hg	Nozzle Dia. (in)		#1	
K-Factor		Filter #		#2	
Mol. WT	g/mole	del H @		#3	
Pstack	In H2O	Meter Factor		#4	
Sample Time	min	Pitot Coeff.		Total	

MATERIAL WEIGHT (g)

	End	Start	Dif.
Pre-Test			
Post-Test			
Run			
O2			
CO2			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

	1	2	3	Avg.

Sample Point	Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
						Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
	36			78.770								
5 - 7	39	0.00031	1.32	80.9	4	140	250	251	57	86	84	
8	42			82.6	4	140	251	250	57	86	84	
9	45			85.2	4	140	251	250	57	87	85	
6 - 7	48			87.2	4	139	254	247	58	87	85	
8	51			89.4	4	140	250	255	58	87	85	
9	54			91.7	4	142	252	248	59	87	85	
7 - 7	57			93.7	4	140	252	247	58	87	85	
8	60			96.1	4	141	251	248	59	87	86	
9	63			98.011	4	140	251	248	58	87	86	
8 7	66			100.11	4	141	250	246	57	87	86	
8	69			102.4	4	143	250	247	56	86	85	
9	72			104.401	4	140	250	246	55	86	85	
Total/Avg.	72											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	11-8-06
Facility	St.Paul	Test Number	3	Job #	
Unit	Old Baghouse	Description	TSP	Page	3 of 3
Location	Stack	Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb	°F	Meter Box #	2010-5	Impinger	End	Start	Dif.
Pbar	In Hg	Nozzle Dia. (in)		#1			
K-Factor		Filter #		#2			
Mol. WT	g/mole	del H @		#3			
Pstack	In H2O	Meter Factor		#4			
Sample Time	min	Pitot Coeff.		Total			

MATERIAL WEIGHT (g)

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		72			104.401								
9	7	75	0.00031	1.32	106.6	4	140	250	246	59	86	85	
	8	78			109.0	4	140	251	247	60	85	84	
	9	81			110.8	4	138	254	249	60	85	85	
10	7	84			112.95	4	134	249	249	57	85	84	
	8	87			115.1	4	132	248	245	56	84	84	
	9	90			117.25	4	132	247	250	56	84	84	
11	7	93			119.4	4	139	248	251	55	85	84	
	8	96			121.6	4	139	247	250	55	85	84	
1	9	99			123.681	4	136	250	251	54	85	84	
12	7	102			125.8	4	132	249	250	55	85	84	
	8	105			128.0	4	130	248	251	55	85	84	
	9	108			130.135	4	129	250	250	55	86	84	
Total/Avg.		108											

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Form Number: 01 | Page 1 of 2

Continued on VEO Form Number: 02

Company Name: Gerdau Ameristeel

Facility Name: " "

Street Address: 678 Red Rock Rd

City: St. Paul | State: Minn. | Zip: 55119

Process: Steel Process | Unit #: EAF | Operating Mode: Normal

Control Equipment: OHH New Baghouses | Operating Mode: "

Describe Emission Point: Above Baghouse Vents

Height of Emiss. Pt. Start: 200 FT End: 200 FT | Height of Emiss. Pt. Rel. to Observer Start: 200 FT End: 200 FT

Distance to Emiss. Pt. Start: End: | Direction to Emiss. Pt. (Degrees) Start: End:

Vertical Angle to Obs. Pt. Start: 2/8 End: | Direction to Obs. Pt. (Degrees) Start: End:

Distance and Direction to Observation Point from Emission Point Start: E-600 FT End: "

Describe Emissions Start: End:

Emission Color Start: End: | Water Droplet Plume: Attached ☐ Detached ☐ None ☐

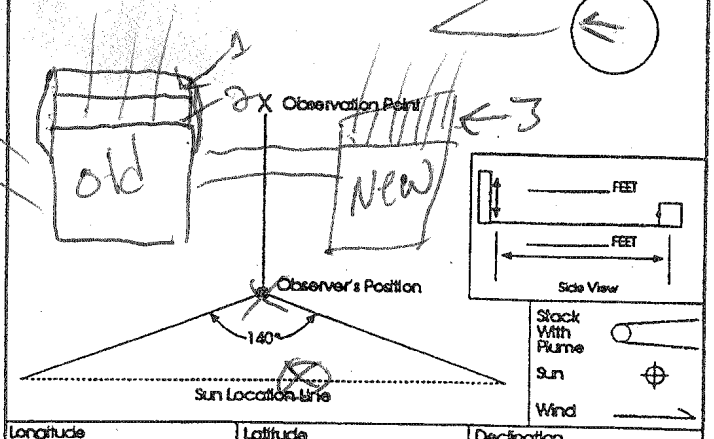
Describe Plume Background Start: Sky End: Sky

Background Color Start: Grey End: Blue | Sky Conditions Start: Clear End: Clear

Wind Speed Start: 3-5 End: 3-5 | Wind Direction Start: S End: S

Ambient Temp. Start: 65 End: 65 | Wet Bulb Temp. | RH Percent

Source Layout Sketch — Draw North Arrow ☐TN ☐MN



Longitude | Latitude | Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time
11-8-06	Cent	1629	1659

Sec / Min	0	15	30	45	Comments
1	0/0	0/0	0/0	0/0	
2	0/0	0/0	0/0	0/0	
3	0/0	0/0	0/0	0/0	
4	0/0	0/0	0/0	0/0	
5	0/0	0/0	0/0	0/0	
6	0/0	0/0	0/0	0/0	
7	0/0	0/0	0/0	0/0	
8	0/0	0/0	0/0	0/0	
9	0/0	0/0	0/0	0/0	
10	0/0	0/0	0/0	0/0	
11	0/0	0/0	0/0	0/0	
12	0/0	0/0	0/0	0/0	
13	0/0	0/0	0/0	0/0	
14	0/0	0/0	0/0	0/0	
15	0/0	0/0	0/0	0/0	
16	0/0	0/0	0/0	0/0	
17	0/0	0/0	0/0	0/0	
18	0/0	0/0	0/0	0/0	
19	0/0	0/0	0/0	0/0	
20	0/0	0/0	0/0	0/0	
21	0/0	0/0	0/0	0/0	
22	0/0	0/0	0/0	0/0	
23	0/0	0/0	0/0	0/0	
24	0/0	0/0	0/0	0/0	
25	0/0	0/0	0/0	0/0	
26	0/0	0/0	0/0	0/0	
27	0/0	0/0	0/0	0/0	
28	0/0	0/0	0/0	0/0	
29	0/0	0/0	0/0	0/0	
30	0/0	0/0	0/0	0/0	

Observer's Name (Print): James Wilson

Observer's Signature: [signature] | Date: 11-8-06

Organization: EMSI

Certified By: ETA | Date:

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number					02	Page 2	Of 2
Continued on VEO Form Number							

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Company Name		
Gerdau Ameristeel		
Facility Name		
Street Address		
City: St. Paul	State: Mn.	Zip

Process	Unit #	Operating Mode
Control Equipment		Operating Mode

Describe Emission Point	
Height of Emiss. Pt. Start / End	Height of Emiss. Pt. Rel. to Observer Start / End
Distance to Emiss. Pt. Start / End	Direction to Emiss. Pt. (Degrees) Start / End

Vertical Angle to Obs. Pt. Start / End	Direction to Obs. Pt. (Degrees) Start / End
Distance and Direction to Observation Point from Emission Point Start / End	

Describe Emissions Start / End	
Emission Color Start / End	Water Droplet Plume: Attached ☐ Detached ☐ None ☐

Describe Plume Background Start / End	
Background Color Start / End	Sky Conditions Start / End
Wind Speed Start / End	Wind Direction Start / End
Ambient Temp. Start / End	Wet Bulb Temp. / RH Percent

Source Layout Sketch

Draw North Arrow ☐TN ☐MN

X Observation Point

Observer's Position

140°

Sun Location Line

FEET

FEET

Side View

Stack With Plume

Sun

Wind

Longitude	Latitude	Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time
11-8-06	EST	1659	1729

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)	
James Wilson	
Observer's Signature	Date: 11-8-06
Organization: ERTSI	
Certified By: ETA	Date

VEOF1.1

Appendix B

Calculated Field Data Results

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Ameristeel	**Date**	8-Nov-06
Facility	St. Paul	**Job Number**	
Unit	Old Baghouse	**Operator**	JW / BD
Location	Inlet Duct	**Test No.**	1
Bar. Pressure (inHg)	29.42	**Fuel Type**	None
Stack Pressure (inH20)	-4.3	**Stack % O2**	20.9
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	0.3
Flue Gas Moisure (%)	1.3	**Area (ft2)**	70.85
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

Traverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)
H	1	8:30 AM	0.56	92	43.82	0
H	2		0.62	95	46.24	0
H	3		0.55	95	43.55	0
H	4		0.50	95	41.52	0
H	5		0.85	115	55.10	0
H	6		0.90	112	56.55	0
H	7		0.87	112	55.60	0
H	8		1.00	118	59.93	0
V	1		0.74	99	50.70	0
V	2		0.82	105	53.65	0
V	3		0.95	115	58.26	0
V	4		1.05	116	61.30	0
V	5		0.94	116	58.00	0
V	6		0.85	116	55.15	0
V	7		0.55	113	44.25	0
V	8	8:41 AM	0.55	114	44.29	0
Averages			0.77	108	51.74	0

Abs. Stack Pres.	29.10	**in.Hg Absolute**
Stack Velocity	51.71	**feet/second**
	3103	**feet/minute**
Stack Volumetric Flow	219821	**WACFM**
	198767	**WSCFM**
	196183	**DSCFM**
	3664	**WACFS**

Area (ft2)	ft/sec	Delta P
3374.92	1.070	0.00033
Baghouse	**H20 Pres Stack**	**Stk Temp _F**
	0.0400	100
	29.422941	560

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Ameristeel	**Date**	8-Nov-06
Facility	St. Paul	**Job Number**	
Unit	Old Baghouse	**Operator**	JW / BD
Location	Inlet Duct	**Test No.**	2
Bar. Pressure (inHg)	29.42	**Fuel Type**	None
Stack Pressure (inH20)	-4.3	**Stack % O2**	20.9
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	0.3
Flue Gas Moisure (%)	1.3	**Area (ft2)**	70.85
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

raverse Point Port	**Depth**	**Time**	**Delta P (in.H2O)**	**Ts (_F)**	**Velocity (ft/sec)**	**Cyclonic (Deg.)**
V	1	12:45 PM	0.60	56	43.86	0
V	2		0.72	57	48.09	0
V	3		0.90	708	80.81	0
V	4		0.98	115	59.17	0
V	5		0.88	115	56.07	0
V	6		0.84	125	55.25	0
V	7		0.55	120	44.52	0
V	8		0.50	119	42.41	0
H	1		0.55	75	42.76	0
H	2		0.58	79	44.07	0
H	3		0.57	84	43.89	0
H	4		0.50	122	42.52	0
H	5		0.77	125	52.90	0
H	6		0.80	125	53.92	0
H	7		0.83	125	54.92	0
H	8	13:14	0.85	124	55.53	0
Averages			0.71	142	51.29	0

Abs. Stack Pres.	29.10	**in.Hg Absolute**
Stack Velocity	51.36	**feet/second**
	3082	**feet/minute**
Stack Volumetric Flow	218326	**WACFM**
	186227	**WSCFM**
	183806	**DSCFM**
	3639	**WACFS**

Area (ft2)	**ft/sec**	**Delta P**
3374.92	1.003	0.00029
Baghouse	**H20 Pres Stack**	**Stk Temp _F**
	0.0400	100
	29.422941	560

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	Gerdau Ameristeel	**Date**	8-Nov-06
Facility	St. Paul	**Job Number**	
Unit	Old Baghouse	**Operator**	JW / BD
Location	Inlet Duct	**Test No.**	3
Bar. Pressure (inHg)	29.42	**Fuel Type**	None
Stack Pressure (inH20)	6.1	**Stack % O2**	20.9
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	0.3
Flue Gas Moisure (%)	1.3	**Area (ft2)**	70.85
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

raverse Point Port	**Depth**	**Time**	**Delta P (in.H2O)**	**Ts (_F)**	**Velocity (ft/sec)**	**Cyclonic (Deg.)**
H	1	12:45 PM	0.72	89	48.92	0
H	2		0.85	89	53.15	0
H	3		0.94	95	56.20	0
H	4		1.00	115	59.00	0
H	5		0.95	120	57.75	0
H	6		0.76	120	51.66	0
H	7		0.56	121	44.38	0
H	8		0.54	120	43.54	0
V	1		0.55	100	43.18	0
V	2		0.61	113	46.00	0
V	3		0.55	118	43.87	0
V	4		0.53	118	43.06	0
V	5		0.79	118	52.58	0
V	6		0.85	118	54.54	0
V	7		0.87	118	55.17	0
V	8	12:56 PM	0.85	118	54.54	0
Averages			0.75	112	50.47	0

Abs. Stack Pres.	29.87	**in.Hg Absolute**
Stack Velocity	50.48	**feet/second**
	3029	**feet/minute**
Stack Volumetric Flow	214597	**WACFM**
	197792	**WSCFM**
	195220	**DSCFM**
	3577	**WACFS**

Area (ft2)	**ft/sec**	**Delta P**
3374.92	1.038	0.00031
Baghouse	**H20 Pres Stack**	**Stk Temp _F**
	0.0400	100
	29.422941	560

Client :	Gerdau Ameristeel		Unit:	Old Baghouse		Location:	Outlet
Test # :	1		Date :	8-Nov-06		Job # :	902,334
Cp =	0.84		Noz Diam =	1.470	in.	Pbar =	29.42 in. Hg
Dry MW =	28.9		Ps =	0.04	in. H2O	Yd =	0.941
Stack Area=	3374.92	sq. ft.	Condensate =	22.4	g	Ref Tmp =	68 _F
Avg. O2 =	20.9	%	Avg. CO2 =	0.3	%		

Data Point	Time (min)	Del P (in. H2O)	Del H (in. H2O)	Meter (ACF)	Vacuum (in. Hg)	Temperatures (_F) Stack	Probe	Filter	Dryer	Meter In	Meter Out
Old-0	0			96.955							
Old-1	3	0.00033	1.46	99.200	4	99	242	258	62	67	65
Old-2	6	0.00033	1.46	101.200	3	99	246	253	63	67	65
Old-3	9	0.00033	1.46	103.100	4	99	248	245	62	68	65
Old-4	12	0.00033	1.46	105.145	4	106	248	247	60	68	66
Old-5	15	0.00033	1.46	107.650	4	109	249	251	60	69	66
Old-6	18	0.00033	1.46	109.935	4	111	249	250	58	70	66
Old-7	21	0.00033	1.46	112.050	4	115	248	252	57	70	67
Old-8	24	0.00033	1.46	114.350	4	110	247	251	56	72	70
Old-9	27	0.00033	1.46	116.650	4	115	248	250	58	72	70
Old-10	30	0.00033	1.46	118.750	4	122	247	248	59	72	70
Old-11	33	0.00033	1.46	120.850	4	123	248	250	59	73	70
Old-12	36	0.00033	1.46	123.211	4	122	247	250	59	72	70
Old-13	39	0.00033	1.46	125.300	4	122	250	248	59	73	71
Old-14	42	0.00033	1.46	127.700	4	122	248	250	58	73	70
Old-15	45	0.00033	1.46	129.862	4	125	249	250	59	73	71
Old-16	48	0.00033	1.46	132.100	4	128	249	249	57	73	71
Old-17	51	0.00033	1.46	134.200	4	130	249	249	56	73	71
Old-18	54	0.00033	1.46	135.540	4	125	249	251	57	72	71
Old-19	57	0.00033	1.46	138.750	4	128	249	250	56	73	71
Old-20	60	0.00033	1.46	141.000	4	127	253	250	55	73	71
Old-21	63	0.00033	1.46	143.250	4	124	252	247	56	73	71
Old-22	66	0.00033	1.46	145.300	4	123	254	248	56	73	71
Old-23	69	0.00033	1.46	147.800	4	125	254	249	57	73	71
Old-24	72	0.00033	1.46	150.001	4	126	251	250	57	73	71
Old-25	75	0.00033	1.46	152.200	4	125	250	250	62	73	71
Old-26	78	0.00033	1.46	154.500	4	125	243	250	60	73	71
Old-27	81	0.00033	1.46	156.750	4	124	243	250	60	73	71
Old-28	84	0.00033	1.46	158.900	4	120	242	249	58	73	71
Old-29	87	0.00033	1.46	161.200	4	117	244	249	57	73	71
Old-30	90	0.00033	1.46	163.428	4	117	245	249	58	73	71
Old-31	93	0.00033	1.46	165.700	4	120	246	249	59	73	71
Old-32	96	0.00033	1.46	168.000	4	122	247	249	60	73	71
Old-33	99	0.00033	1.46	170.235	4	122	247	248	58	73	71
Old-34	102	0.00033	1.46	172.400	4	123	248	249	57	73	71
Old-35	105	0.00033	1.46	174.700	4	125	248	250	55	73	71
Old-36	108	0.00033	1.46	176.955	4	123	247	251	56	73	71
Ave./Total	108	0.000330	1.46	80.000	4	119	248	250	58	72	70

Calculated Data and Test Results :

Sample Gas Volume =	73.888	DSCF
Water Vapor =	1.056	SCF
Moisture Content =	1.41	%
Average Stack Velocity =	1.1	ft/sec
Stack Flow =	218675	WACFM
	195959	WSCFM
	193197	DSCFM

% Isokinetic = 101.4 %

Wet MW (actual) = 28.7306083 %
Wet MW (assumed) = 28.66632 %

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	Gerdau Ameristeel		Unit:	Old Baghouse		Location:	Outlet
Test # :	2		Date :	8-Nov-06		Job # :	902,334
Cp =	0.84		Noz Diam =	1.470	in.	Pbar =	29.42 in. Hg
Dry MW =	28.9		Ps =	0.04	in. H2O	Yd =	0.941
Stack Area=	3374.92	sq. ft.	Condensate =	19.1	g	Ref Tmp =	68 _F
Avg. O2 =	20.9	%	Avg. CO2 =	0.3	%		

Data Point	Time (min)	Del P (in. H2O)	Del H (in. H2O)	Meter (ACF)	Vacuum (in. Hg)	Temperatures (_F) Stack	Probe	Filter	Dryer	Meter In	Meter Out
Old-0	0			77.333							
Old-1	3	0.00029	1.23	79.600	3	110	247	251	59	73	73
Old-2	6	0.00029	1.23	82.000	3	124	248	252	56	75	76
Old-3	9	0.00029	1.23	84.470	3	112	251	251	55	80	77
Old-4	12	0.00029	1.23	86.200	3	130	250	250	56	80	78
Old-5	15	0.00029	1.23	88.300	3	132	249	249	55	80	78
Old-6	18	0.00029	1.23	90.400	3	132	244	251	55	81	78
Old-7	21	0.00029	1.23	92.500	3	135	250	250	56	81	79
Old-8	24	0.00029	1.23	94.600	3	136	251	248	55	81	79
Old-9	27	0.00029	1.23	96.748	3	134	246	249	56	81	79
Old-10	30	0.00029	1.23	98.100	3	134	249	252	54	81	79
Old-11	33	0.00029	1.23	100.800	3	133	249	250	55	81	79
Old-12	36	0.00029	1.23	102.612	3	132	249	249	54	82	79
Old-13	39	0.00029	1.23	105.200	4	130	249	250	68	82	80
Old-14	42	0.00029	1.23	107.600	4	130	251	251	60	82	80
Old-15	45	0.00029	1.23	109.000	4	132	251	250	55	82	80
Old-16	48	0.00029	1.23	111.200	4	133	250	249	55	82	80
Old-17	51	0.00029	1.23	113.200	4	133	251	250	54	82	80
Old-18	54	0.00029	1.23	115.200	4	133	250	249	54	83	80
Old-19	57	0.00029	1.23	117.300	4	132	251	250	54	83	81
Old-20	60	0.00029	1.23	119.400	4	132	251	250	54	83	81
Old-21	63	0.00029	1.23	121.700	4	132	250	251	54	85	81
Old-22	66	0.00029	1.23	123.500	4	131	250	248	56	85	82
Old-23	69	0.00029	1.23	125.700	4	130	251	246	57	85	82
Old-24	72	0.00029	1.23	127.660	4	133	244	251	57	86	82
Old-25	75	0.00029	1.23	130.000	4	132	251	246	59	86	84
Old-26	78	0.00029	1.23	131.800	4	133	250	247	58	86	84
Old-27	81	0.00029	1.23	133.910	4	134	251	248	55	87	84
Old-28	84	0.00029	1.23	136.000	4	133	250	249	54	87	85
Old-29	87	0.00029	1.23	138.300	4	136	244	249	53	87	85
Old-30	90	0.00029	1.23	140.100	4	135	246	250	53	87	85
Old-31	93	0.00029	1.23	142.200	4	134	247	249	54	86	85
Old-32	96	0.00029	1.23	144.400	4	134	248	248	54	86	86
Old-33	99	0.00029	1.23	146.310	4	134	247	248	54	86	85
Old-34	102	0.00029	1.23	148.800	4	135	246	248	56	86	85
Old-35	105	0.00029	1.23	150.500	4	134	246	247	56	85	85
Old-36	108	0.00029	1.23	152.511	4	134	247	248	58	85	85
Ave./Total	108	0.000290	1.23	75.178	4	131	249	249	56	83	81

Calculated Data and Test Results :

Sample Gas Volume =	67.959	DSCF
Water Vapor =	0.901	SCF
Moisture Content =	1.31	%
Average Stack Velocity =	1.0	ft/sec
Stack Flow =	207082	WACFM
	181777	WSCFM
	179399	DSCFM
% Isokinetic =	100.4	%
Wet MW (actual) =	28.7416488	%
Wet MW (assumed) =	28.55748	%

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	Gerdau Ameristeel		Unit:	Old Baghouse		Location:	Outlet
Test # :	3		Date :	8-Nov-06		Job # :	902,334
Cp =	0.84		Noz Diam =	1.470	in.	Pbar =	29.47 in. Hg
Dry MW =	28.9		Ps =	0.04	in. H2O	Yd =	0.941
Stack Area=	3374.92	sq. ft.	Condensate =	21.0	g	Ref Tmp =	68 _F
Avg. O2 =	20.9	%	Avg. CO2 =	0.3	%		

Data Point	Time (min)	Del P (in. H2O)	Del H (in. H2O)	Meter (ACF)	Vacuum (in. Hg)	Temperatures (_F) Stack	Probe	Filter	Dryer	Meter In	Meter Out
Old-0	0			52.884							
Old-1	3	0.00031	1.32	54.900	4	128	251	249	59	85	84
Old-2	6	0.00031	1.32	57.150	4	127	250	250	58	85	84
Old-3	9	0.00031	1.32	59.330	4	126	251	249	56	85	84
Old-4	12	0.00031	1.32	51.600	4	126	250	248	56	84	83
Old-5	15	0.00031	1.32	63.700	4	128	251	249	55	83	83
Old-6	18	0.00031	1.32	65.770	4	128	251	248	54	84	83
Old-7	21	0.00031	1.32	67.900	4	129	250	249	56	84	83
Old-8	24	0.00031	1.32	70.200	4	131	250	248	55	84	83
Old-9	27	0.00031	1.32	72.200	4	130	250	249	56	85	83
Old-10	30	0.00031	1.32	74.400	4	132	250	245	55	85	83
Old-11	33	0.00031	1.32	76.600	4	129	251	247	56	85	84
Old-12	36	0.00031	1.32	78.770	4	124	252	248	56	86	84
Old-13	39	0.00031	1.32	80.900	4	140	250	251	57	86	84
Old-14	42	0.00031	1.32	82.600	4	140	251	250	57	86	84
Old-15	45	0.00031	1.32	85.200	4	140	251	250	57	87	85
Old-16	48	0.00031	1.32	87.200	4	139	254	247	58	87	85
Old-17	51	0.00031	1.32	89.400	4	140	250	255	58	87	85
Old-18	54	0.00031	1.32	91.700	4	142	252	248	59	87	85
Old-19	57	0.00031	1.32	93.700	4	140	252	247	58	87	85
Old-20	60	0.00031	1.32	96.100	4	141	251	248	59	87	86
Old-21	63	0.00031	1.32	98.011	4	140	251	248	58	87	86
Old-22	66	0.00031	1.32	100.110	4	141	250	246	57	87	86
Old-23	69	0.00031	1.32	102.400	4	143	250	247	56	86	85
Old-24	72	0.00031	1.32	104.401	4	140	250	246	55	86	85
Old-25	75	0.00031	1.32	106.600	4	140	250	246	59	86	85
Old-26	78	0.00031	1.32	109.000	4	140	251	247	60	85	84
Old-27	81	0.00031	1.32	110.800	4	138	254	249	60	85	85
Old-28	84	0.00031	1.32	112.950	4	134	249	249	57	85	84
Old-29	87	0.00031	1.32	115.100	4	132	248	245	56	84	84
Old-30	90	0.00031	1.32	117.250	4	132	247	250	56	84	84
Old-31	93	0.00031	1.32	119.400	4	139	248	251	55	85	84
Old-32	96	0.00031	1.32	121.600	4	139	247	250	55	85	84
Old-33	99	0.00031	1.32	123.681	4	136	250	251	54	85	84
Old-34	102	0.00031	1.32	125.800	4	132	249	250	55	85	84
Old-35	105	0.00031	1.32	128.000	4	130	248	251	55	85	84
Old-36	108	0.00031	1.32	130.135	4	129	250	250	55	86	84
Ave./Total	108	0.000310	1.32	78.535	4	135	250	249	57	85	84

Calculated Data and Test Results :

Sample Gas Volume =	70.774	DSCF
Water Vapor =	0.990	SCF
Moisture Content =	1.38	%
Average Stack Velocity =	1.1	ft/sec
Stack Flow =	214514	WACFM
	187632	WSCFM
	185044	DSCFM
% Isokinetic =	101.4	%
Wet MW (actual) =	28.7338234	%
Wet MW (assumed) =	28.55748	%

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

METHOD 9 REDUCED FIELD DATA

Client:	Gergau Ameristeel	Date:	11-08-06
Facility:	St. Paul	Time:	16:29-17:29
Unit:	Old Baghouse	Project #:	902334
Location:	Vents	Comments:	

Test Results:

Maximum 6 Minute Average:	0.0	%
Average Opacity:	0.0	%
Maximum Opacity:	0.0	%
Minimum Opacity:	0.0	%
# of Readings >20%:	0	
Number of Readings:	240	

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

METHOD 9 REDUCED FIELD DATA

Client:	Gergau Ameristeel	Date:	11-08-06
Facility:	St. Paul	Time:	16:29-17:29
Unit:	Old Baghouse	Project #:	902334
Location:	Vents	Comments:	

Test Results:

Maximum 6 Minute Average:	0.0	%
Average Opacity:	0.0	%
Maximum Opacity:	0.0	%
Minimum Opacity:	0.0	%
# of Readings >20%:	0	
Number of Readings:	240	

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

Appendix C

Process Operations Data

Minnesota Pollution Control Agency

Operating Data Summary For Process Sources

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

Form ST-05

12/01/04

Test Date(s): 11-8-06 **Process Equipment Number/Identification:** EU 01

Company Name: Gerdau Ameristeel

Equipment & Operating Data

1. Process Equipment Description: Old Baghouse (Ladle Arc Furnace)
2. Were the process and control equipment operated consistent with normal procedures? YES ☑ NO ☐ If no, explain:
3. Include copy of production records or instrumentation which indicates rate of production or operation of the equipment, i.e. units per hour, pounds per hour, pressure, air flow, etc.
4. Date(s) and procedure(s) of last maintenance/cleaning within 6 months: ☑ Remains unchanged from info. provided in test plan
5. Process rate (amount of raw material or finished product per hour, wet or dry basis) while combusting (list fuel type(s) and ratios as appropriate) 84.4 Tons/Hr

Process Parameter: list type and units	Run 1	Run 2	Run 3
Tons/Hour	84.4 Tons/Hr	84.4 Tons/Hr	84.4 Tons/Hr
Fuel Input (list units)			
Heat Input (10^6 British thermal units/hour)			

6. Summarize control equipment operating data documented during testing. Values reported should reflect maximum, minimum, averages, or as approved in the test plan. (See test plan and approval letter)

Examples of APC equipment and parameters generally monitored. Monitor as in test plan and/or approval letter.

- **Scrubber** (list type of scrubber): ΔP (in. w.c.) and feed rate (gpm and psig)
- **Baghouse, Cyclone, and Multi-clone:** ΔP (in. w.c.)
- **Catalytic Incinerator** :($°F_{in}$,$°F_{out}$) and Thermal Incinerator: ($°F_{temperature}$)
- **ESP:** Number and identity of operating field(s)

APC and parameter monitored	Run 1	Run 2	Run 3
Old Baghouse (DP in w.c)	5.05	5.17	5.24
Fan #1 Amps	108	108	108
Fan #2 Amps	118	118	118
List pollutant & averaging basis.--should reflect permit	**Run 1**	**Run 1**	**Run 1**
Continuous Opacity Monitor(list hourly average)			
_____Monitor (list averaging basis):			
_____Monitor (list averaging basis:			

Abbreviations: **APC-air pollution control** **gpm.-gallons per minute** **in. w.c.-inches of water column**
lbs.-pounds **psig-pressure per square inch gauge** **ΔP- pressure drop**

Note: This form provides only a summary of the operating conditions during the performance test. Additional and more detailed records are required to meet the requirements of Minn. R. 7017.2035, subp. 3. This form is to be submitted as part of the performance test report.

Old Bag

Rouse

	T-1	T-2	T-3
DP-1	5.32	5.39	5.47
2	4.75	4.77	4.80
3	5.69	5.30	6.05
4	5.34	4.49	4.80
5	5.71	5.72	5.90
6	4.73	4.64	5.21
7	5.17	5.11	5.66
8	5.79	5.53	5.81
9	4.53	4.80	4.65
10	5.4	5.07	6.11
11	5.08	4.5	5.49
12	4.77	4.94	5.01

East

T-1-108 T-2-108 T-3-108

West

T-1-118 AMP T-2-118 - T-3-118

Nov-06

DATE	# OF HEAT	MTD # OF HEATS	TONS PLANNED	MTD TONS PLANNED	Tons	Adjusted Tons	MTD Adjusted Tons	Daily Operating Hours	Daily Matrix Hours	Adjusted TPH	Matrix TPH	Total Tap to Tap Time	Avg Tap to Tap	Power on Time	Avg Power on Time	Schedule prodution time	Total Power off time	Avg Power off Time
1	17	17	1620	1620	1519.9	1519.9	1519.9	24	24	63.6	63.3	1434.51	84.4	760.15	44.71	1440.00	674.36	39.7
2	9	26	945	2565	796.41	796.4	2316.31	14	24	71.9	33.2	664.62	73.8	413.35	45.93	840.00	251.27	27.9
3	16	42	1620	4185	1437.5	1437.5	3753.81	24	24	58.9	59.9	1465.43	91.6	733.59	45.85	1440.00	731.84	45.7
4	19	61	1620	5805	1631.9	1631.9	5385.71	24	24	67.8	68.0	1445.03	76.1	892.54	46.98	1440.00	552.49	29.1
5	19	80	1620	7425	1721.5	1721.5	7107.21	24	24	68.4	71.7	1510.31	79.5	841.34	44.28	1440.00	668.97	35.2
6	21	101	1620	9045	1834.5	1834.5	8941.71	24	24	78.4	76.4	1403.21	66.8	872.35	41.54	1440.00	530.86	25.3
7	19	120	1620	10665	1726.3	1726.3	10668.01	24	24	74.6	71.9	1389.29	73.1	840	44.21	1440.00	549.29	28.9
8	22	142	1620	12285	2026.1	2026.1	12694.11	24	24	80.1	84.4	1518.12	69.0	900.22	40.92	1440.00	617.90	28.1
9	16	158	1620	13905	1457.8	1457.8	14151.91	24	24	67.8	60.7	1289.25	80.6	667	41.69	1440.00	622.25	38.9
10	14	172	1140.75	15045.75	1291.4	1291.4	15443.31	16.9	24	66.3	53.8	1169.52	83.5	628.21	44.87	1014.00	541.31	38.7
11	2	174	189	15234.75	157.1	157.1	15600.41	2.8	24	53.5	6.5	176.3	88.2	80.4	40.20	168.00	95.90	48.0
12	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
13	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
14	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
15	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
16	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
17	0	174	0	15234.75	0	0.0	15600.41	0	24	0.0	0.0	0	0.0	0	0.00	0.00	0.00	0.0
18	3	177	540	15774.75	248.8	248.8	15849.21	8	24	36.4	10.4	410.6	136.9	215.33	71.78	480.00	195.27	65.1
19	15	192	1620	17394.75	1282.1	1282.1	17131.31	24	24	53.0	53.4	1450.44	96.7	860.21	57.35	1440.00	590.23	39.3
20	12	204	1620	19014.75	1063.8	1063.8	18195.11	24	24	44.4	44.3	1438.49	119.9	588.38	49.03	1440.00	850.11	70.8
21	14	218	1620	20634.75	1192.3	1192.3	19387.41	24	24	50.6	49.7	1414	101.0	651.21	46.52	1440.00	762.79	54.5
22	13	231	1620	22254.75	1177.8	1177.8	20565.21	24	24	56.0	49.1	1262.58	97.1	624.04	48.00	1440.00	638.54	49.1
23	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0	0.0	0	0.0		0.0	0.00	0.00	0.0
24	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0	0.0	0	0.0		0.0	0.00	0.00	0.0
25	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0	0.0	0	0.0		0.0	0.00	0.00	0.0
26	0	231	0	22254.75	0	0.0	20565.21	0	0	0.0	0.0	0	0.0		0.0	0.00	0.00	0.0
27	12	243	1620	23874.75	1049.3	1049.3	21614.51	24	24	51.7	43.7	1216.83	101.4	560.14	46.68	1440.00	656.69	54.7
28	14	257	1620	25494.75	1273.77	1273.8	22888.28	24	24	48.2	53.1	1585.77	113.3	646.33	46.17	1440.00	939.44	67.1
29	19	276	1620	27114.75	1716.2	1716.2	24604.48	24	24	72.8	71.5	1413.92	74.4	872.4	45.92	1440.00	541.52	28.5
30	16	292	1620	28734.75	1445.8	1445.8	26050.28	24	24	58.2	60.2	1491.19	93.2	785.05	49.07	1440.00	706.14	44.1
TOTAL	292.0	292.0	1620	28734.75	26050.3	26050.3	26050.3	24	624.0	62.1	135.7	25149.4	86.1	13432.2	46.00	25542.00	11717.17	40.1

Appendix D

Laboratory test Analyses

Particulate Weight Analysis

Client: Gerdau Ameristeel
Facility: St. Paul
Project #: 902334
Unit: Old Baghouse
Date: 11-8-06

Type: (TSP) PM10 PM2.5
Test #: (1) 2 3 Blank
Analyst: MC

Filter ID#: TSP 85

Initial Weight (g)	Date	8-28-06	8-28-06		0.3014	
	Time	920	1417			
	Weight	0.3015	0.3013			
Final Weight (g)	Date	12-13-06	12-14-06		0.3026	Total: 1.2 Mg
	Time	819	810			
	Weight	0.3026	0.3026			

Sample Volume: 125 ml

Acetone ID#: A-6

Initial Weight (g)	Date	10-27-06	10-27-06		116.2702	
	Time	906	1328			
	Weight	116.2704	116.2700			
Final Weight (g)	Date	12-13-06	12-13-06		116.2778	Total: 7.6 Mg
	Time	1119	1720			
	Weight	116.2775	116.2780			

Sample Volume: 200ml

Organic ID#: 6

Initial Weight (g)	Date	10-27-06	10-27-06		86.4824	
	Time	908	1330			
	Weight	86.4823	86.4824			
Final Weight (g)	Date	12-13-06	12-13-06		86.4836	Total: 1.2 Mg
	Time	1121	1722			
	Weight	86.4835	86.4838			

Sample Volume: 250+250+175+50ml

Aqueous ID#: A-12

Initial Weight (g)	Date	10-27-06	10-27-06		117.6649	
	Time	910	1333			
	Weight	117.6650	117.6648			
Final Weight (g)	Date	12-13-06	12-13-06		117.6714	Total: 6.5 Mg
	Time	1123	1724			
	Weight	117.1713	117.6715			

Notes:

Particulate Weight Analysis

Client: Gerdau Ameristeel
Facility: St. Paul
Project #: 902334
Unit: Old Baghouse
Date: 11-8-06

Type: (TSP) PM10 PM2.5
Test #: 1 (2) 3 Blank
Analyst: MC

Filter ID#: TSP82

Initial Weight (g)	Date	8-28-06	8-28-06		0.3015	
	Time	921	1419			
	Weight	0.3015	0.3015			
Final Weight (g)	Date	12-13-06	12-14-06		0.2992	Total: 0.0 Mg
	Time	821	1013			
	Weight	0.2994	0.2991			

Acetone ID#: 5

Sample Volume: 150ml

Initial Weight (g)	Date	10-27-06	10-27-06		88.4032	
	Time	912	1335			
	Weight	88.4034	88.4031			
Final Weight (g)	Date	12-13-06	12-13-06		88.4110	Total: 7.8 Mg
	Time	1125	1726			
	Weight	88.4111	88.4109			

Organic ID#: A-9

Sample Volume: 200ml

Initial Weight (g)	Date	10-27-06	10-27-06		113.3830	
	Time	914	1337			
	Weight	113.3830	113.3831			
Final Weight (g)	Date	12-13-06	12-13-06		113.3841	Total: 1.1 Mg
	Time	1127	1728			
	Weight	113.3836	113.3843			

Aqueous ID#: 11

Sample Volume: 250+250+100/125ml

Initial Weight (g)	Date	10-27-06	10-27-06		85.8512	
	Time	916	1338			
	Weight	85.8512	85.8511			
Final Weight (g)	Date	12-13-06	12-13-06		85.8557	Total: 4.5 Mg
	Time	1129	1730			
	Weight	85.8556	85.8558			

Notes:

Particulate Weight Analysis

Client: Gerdau Ameristeel
Facility: St. Paul
Project #: 902334
Unit: Old Baghouse
Date: 11-8-06

Type: (TSP) PM10 PM2.5
Test #: 1 2 (3) Blank
Analyst: MC

Filter ID#: TSP 84

Initial Weight (g)	Date	8-28-06	8-28-06		0.3023	
	Time	922	1421			
	Weight	0.3022	0.3024			
Final Weight (g)	Date	12-13-06	12-14-06		0.3024	Total: 0.1 Mg
	Time	823	1018			
	Weight	0.3021	0.3026			

Sample Volume: 225ml

Acetone ID#: 10

Initial Weight (g)	Date	10-27-06	10-27-06		86.1694	
	Time	919	1340			
	Weight	86.1694	86.1695			
Final Weight (g)	Date	12-13-06	12-13-06		86.1784	Total: 9.0 Mg
	Time	1130	1732			
	Weight	86.1783	86.1786			

Sample Volume: 700ml

Organic ID#: ES

Initial Weight (g)	Date	10-27-06	10-27-06		112.2317	
	Time	920	1342			
	Weight	112.2315	112.2319			
Final Weight (g)	Date	12-13-06	12-13-06		112.2332	Total: 1.5 Mg
	Time	1132	1734			
	Weight	112.2334	112.2330			

Sample Volume: 250+250+75+160

Aqueous ID#: 84

Initial Weight (g)	Date	10-27-06	10-27-06		105.8174	
	Time	922	1343			
	Weight	105.8176	105.8172			
Final Weight (g)	Date	12-13-06	12-13-06		105.8220	Total: 4.6 Mg
	Time	1135	1736			
	Weight	105.8218	105.8222			

Notes:

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Organic Condensable Emissions

Client	**Gerdau Ameristeel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902334**
Unit	**Old Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***9:54-12:32***		***Date***	***11/8/2006***
Organic Net Gain (Solvent)		**1.2**	**mg**	**20.90**	**% Oxygen**
Sample Gas Volume		**73.888**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**193197**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0162**	**mg/dscf**
Particulate Emission Rate				**0.4150**	**lbs/hr**
Particulate Concentration				**0.00025**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 2	***Time***	***13:28-16:14***		***Date***	***11/8/2006***
Organic Net Gain (Solvent)		**1.1**	**mg**	**20.90**	**% Oxygen**
Sample Gas Volume		**67.959**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**179399**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0162**	**mg/dscf**
Particulate Emission Rate				**0.3841**	**lbs/hr**
Particulate Concentration				**0.00025**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 3	***Time***	***16:36-18:33***		***Date***	***11/8/2006***
Organic Net Gain (Solvent)		**1.5**	**mg**	**20.90**	**% Oxygen**
Sample Gas Volume		**70.774**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**185044**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0212**	**mg/dscf**
Particulate Emission Rate				**0.5187**	**lbs/hr**
Particulate Concentration				**0.00033**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3			
Particulate Concentration	**NA**	**lbs/mmBtu**	
Particulate Concentration	**0.0179**	**mg/dscf**	
Particulate Emission Rate	**0.4392**	**lbs/hr**	
Particulate Concentration	**0.00028**	**gr/dscf**	
Particulate Concentration	**#DIV/0!**	**gr/dscf @7% Oxygen**	

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Aqueous Condensable Emissions

Client	**North Star Steel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902334**
Unit	**Old Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***9:54-12:32***		***Date***	***11/8/2006***
Dried Sample Net Gain		**6.5**	**mg**	**20.90**	**% Oxygen**
Aqueous Net Gain (H20)		**6.5**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**73.888**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**193197**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.088**	**mg/dscf**
Particulate Emission Rate				**2.248**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 2	***Time***	***13:28-16:14***		***Date***	***11/8/2006***
Dried Sample Net Gain		**4.5**	**mg**	**20.90**	**% Oxygen**
Aqueous Net Gain (H20)		**4.5**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**67.959**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**179399**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.066**	**mg/dscf**
Particulate Emission Rate				**1.571**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 3	***Time***	***16:36-18:33***		***Date***	***11/8/2006***
Dried Sample Net Gain		**4.6**	**mg**	**20.90**	**% Oxygen**
Aqueous Net Gain (H20)		**4.6**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**70.774**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**185044**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.065**	**mg/dscf**
Particulate Emission Rate				**1.591**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3

Particulate Concentration	**NA**	**lbs/mmBtu**
Particulate Concentration	**0.073**	**mg/dscf**
Particulate Emission Rate	**1.803**	**lbs/hr**
Particulate Concentration	**0.001**	**gr/dscf**
Particulate Concentration	**#DIV/0!**	**gr/dscf @7% Oxygen**

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Filterable Emissions

Client	**Gerdau Ameristeel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902334**
Unit	**Old Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***9:54-12:32***		***Date***	***11/8/2006***
Filter Net Gain		**1.2**	**mg**	**20.90**	**% Oxygen**
Probe Rinse Net Gain		**7.6**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**73.888**	**dscf**		
Stack Volumetric Flow		**193197**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.119**	**mg/dscf**
Particulate Emission Rate				**3.043**	**lbs/hr**
Particulate Concentration				**0.002**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 2	***Time***	***13:28-16:14***		***Date***	***11/8/2006***
Filter Net Gain		**0.0**	**mg**	**20.90**	**% Oxygen**
Probe Rinse Net Gain		**7.8**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**67.959**	**dscf**		
Stack Volumetric Flow		**179399**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.115**	**mg/dscf**
Particulate Emission Rate				**2.723**	**lbs/hr**
Particulate Concentration				**0.002**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

TEST 3	***Time***	***16:36-18:33***		***Date***	***11/8/2006***
Filter Net Gain		**0.1**	**mg**	**20.90**	**% Oxygen**
Probe Rinse Net Gain		**9.0**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**70.774**	**dscf**		
Stack Volumetric Flow		**185044**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.129**	**mg/dscf**
Particulate Emission Rate				**3.147**	**lbs/hr**
Particulate Concentration				**0.002**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3

Particulate Concentration	**NA**	**lbs/mmBtu**
Particulate Concentration	**0.121**	**mg/dscf**
Particulate Emission Rate	**2.971**	**lbs/hr**
Particulate Concentration	**0.002**	**gr/dscf**
Particulate Concentration	**#DIV/0!**	**gr/dscf @7% Oxygen**

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Total Emissions

Client	**Gerdau Ameristeel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902334**
Unit	**Old Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***9:54-12:32***		***Date***	***11/8/2006***
Filterable Net Gain		**8.8**	**mg**	**20.90**	**% Oxygen**
Condensable Net Gain		**7.7**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**73.888**	**dscf**		
Stack Volumetric Flow		**193197**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.223**	**mg/dscf**
Particulate Emission Rate				**5.706**	**lbs/hr**
Particulate Concentration				**0.003**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**16.50**	**mg**

TEST 2	***Time***	***13:28-16:14***		***Date***	***11/8/2006***
Filterable Net Gain		**7.8**	**mg**	**20.90**	**% Oxygen**
Condensable Net Gain		**5.6**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**67.959**	**dscf**		
Stack Volumetric Flow		**179399**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.197**	**mg/dscf**
Particulate Emission Rate				**4.678**	**lbs/hr**
Particulate Concentration				**0.003**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**13.40**	**mg**

TEST 3	***Time***	***16:36-18:33***		***Date***	***11/8/2006***
Filterable Net Gain		**9.1**	**mg**	**20.90**	**% Oxygen**
Condensable Net Gain		**6.1**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**70.774**	**dscf**		
Stack Volumetric Flow		**185044**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.215**	**mg/dscf**
Particulate Emission Rate				**5.256**	**lbs/hr**
Particulate Concentration				**0.003**	**gr/dscf**
Particulate Concentration				**#DIV/0!**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**15.20**	**mg**

RESULT AVERAGE TEST 1-3			
Particulate Concentration	**NA**	**lbs/mmBtu**	
Particulate Concentration	**0.212**	**mg/dscf**	
Particulate Emission Rate	**5.214**	**lbs/hr**	
Particulate Concentration	**0.003**	**gr/dscf**	
Particulate Concentration	**#DIV/0!**	**gr/dscf @7% Oxygen**	

Appendix E

Equipment Calibrations and Opacity Certification

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	2010-5
Console Serial Number	
DGM Model Number	2010-4
DGM Serial Number	

Calibration Conditions			
Date	Time	24-Aug-06	10:45
Barometric Pressure		28.8	in Hg
Theoretical Critical Vacuum[1]		13.6	in Hg
Calibration Technician		nt	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3°R^{1/2})/(in.Hg*min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
10.0	0.2	823.120	826.328	73	74	TA 40	0.2305	72	72	15
10.0	0.6	826.328	831.000	74	75	TA 48	0.3354	72	72	15
10.0	1.0	831.000	837.076	75	76	TA 55	0.4352	72	72	15
10.0	1.9	837.076	845.454	76	76	TA 63	0.6001	72	72	15
10.0	3.3	845.454	856.452	76	78	TA 73	0.7928	72	72	12

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
3.054	0.305	2.874	0.287	0.941	0.000	0.287	1.558	-0.175
4.442	0.444	4.182	0.418	0.941	0.001	0.418	1.686	-0.047
5.773	0.577	5.427	0.543	0.940	-0.001	0.543	1.766	0.034
7.972	0.797	7.483	0.748	0.939	-0.002	0.748	1.826	0.094
10.482	1.048	9.885	0.989	0.943	0.002	0.989	1.827	0.094
				0.941	Y Average		1.733	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Date 8-24-06

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	2010-07
Console Serial Number	
DGM Model Number	2010-7
DGM Serial Number	

Calibration Conditions			
Date	Time	5-Sep-06	1:30
Barometric Pressure		29.1	in Hg
Theoretical Critical Vacuum[1]		13.7	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 * {}^oR^{1/2})/(in.Hg*min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
10.0	0.3	1.276	4.337	79	79	TA40	0.2305	76	78	15
10.0	0.6	4.337	8.769	79	80	TA48	0.3354	78	79	15
10.0	1.0	8.769	14.543	80	81	TA55	0.4352	79	80	15
10.0	2.0	14.543	22.505	81	81	TA63	0.6001	80	80	15
10.0	3.5	22.505	32.957	81	82	TA73	0.7928	80	81	15

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
2.918	0.292	2.895	0.289	0.992	0.000	0.289	1.731	-0.110
4.225	0.423	4.206	0.421	0.995	0.003	0.421	1.823	-0.018
5.500	0.550	5.452	0.545	0.991	-0.001	0.545	1.808	-0.033
7.596	0.760	7.515	0.751	0.989	-0.003	0.751	1.912	0.071
10.000	1.000	9.923	0.992	0.992	0.000	0.992	1.931	0.090
				0.992	Y Average		1.841	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature [signature] Date 9-5-06

VISIBLE EMISSIONS EVALUATOR

This is to certify that

James Wilson

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

344906	*Minneapolis, Minnesota*	*October 4, 2006*
Certificate Number	Location	Date of Issue

Thomas Hoel
President

Michael W. Sunsford
Director of Training

Date _____

S-TYPE PITOT GEOMETRIC CALIBRATION

PART 2 - PITOT ALIGNMENT

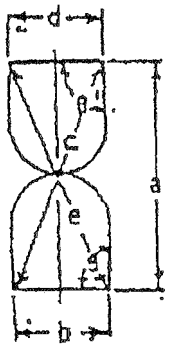
Probe Identification 11:22 Pitot Identification 11:22

Technical Specialist NATE TRALT

Date 8-22-06

A.

Transverse Tube Axis



a 0.902
b 0.382
c 0.991
d 0.362
e 0.986

$\frac{a^2 + b^2 - c^2}{2ab} = \cos\theta$

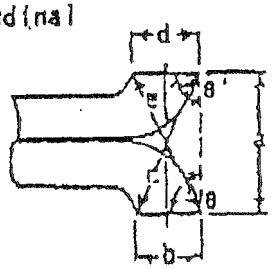
$\frac{a^2 + d^2 - e^2}{2ad} = \cos\theta'$

θ 91.8 $(80^\circ < \theta < 100^\circ)$

θ' 92.4 $(80^\circ < \theta' < 100^\circ)$

B.

Longitudinal Tube Axis



a 0.901
b 0.360
c 0.990
d 0.401
e 1.000

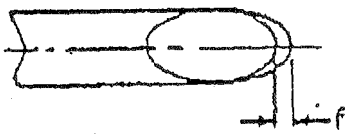
$\frac{a^2 + b^2 - c^2}{2ab} = \cos\theta$

$\frac{a^2 + d^2 - e^2}{2ad} = \cos\theta'$

θ 93.1 $(85^\circ < \theta < 95^\circ)$

θ' 92.1 $(85^\circ < \theta' < 95^\circ)$

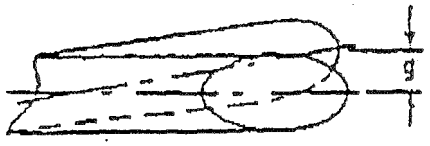
C.



f .047

(f < 1/8")

D.



g

(g < 1/32")

NOTE: values in parentheses are EPA Method 2 specifications.

PROBE THERMOCOUPLE CALIBRATION

			Tolerances
Expected Stack Temperature (T_s)	_____	°R	
~~Mercury~~ Thermometer (T_{ref})	72.7	°R	($T_s \pm 10\%$)
Thermocouple Readout	72.0	°R	($T_{ref} \pm 1.5\%$)

0.96%

Probe Identification 11:22

Technician [signature] Date 8-22-06

Date _____

S-TYPE PITOT GEOMETRIC CALIBRATION

PART 2 - PITOT ALIGNMENT

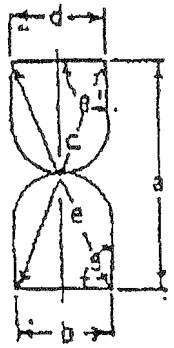
Probe Identification 12:00 Pitot Identification 12:00

Technical Specialist NATE TVALT

Date 8-23-06

A.

Transverse Tube Axis



a 1.026
b 0.362
c 1.083
d 0.378
e 1.069

$\frac{a^2 + b^2 - c^2}{2ab} = \cos\theta$

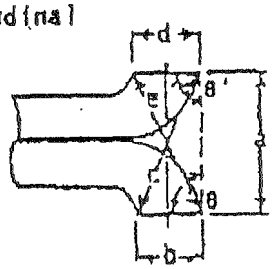
$\frac{a^2 + d^2 - e^2}{2ad} = \cos\theta'$

θ 89.1 $(80^\circ < \theta < 100^\circ)$

θ' 86.1 $(80^\circ < \theta' < 100^\circ)$

B.

Longitudinal Tube Axis



a 1.020
b 0.561
c 1.144
d 0.551
e 1.162

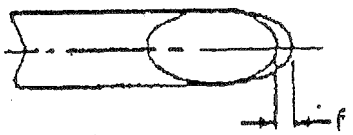
$\frac{a^2 + b^2 - c^2}{2ab} = \cos\theta$

$\frac{a^2 + d^2 - e^2}{2ad} = \cos\theta'$

θ 87.7 $(85^\circ < \theta < 95^\circ)$

θ' 90.3 $(85^\circ < \theta' < 95^\circ)$

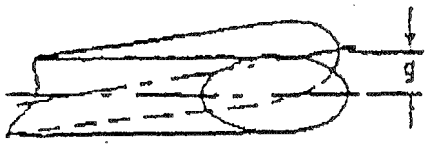
C.



f 0.049

$(f < 1/8")$

D.



g 0

$(g < 1/32")$

NOTE: values in parentheses are EPA Method 2 specifications.

PROBE THERMOCOUPLE CALIBRATION

			Tolerances	
Expected Stack Temperature (T_s)	_____	°R		
~~Mercury~~ Thermometer (T_{ref})	72.7	°R	($T_s \pm 10\%$)	1.92%
Thermocouple Readout	71.3	°R	($T_{ref} \pm 1.5\%$)	

Probe Identification 12:00

Technician JZM JZM Date 8-23-06

Appendix F

Test Plan and Approval Letter

Minnesota Pollution Control Agency

Performance Test Report Completeness Criteria

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

FORM -PTRCC01

03/24/06

The owner or operator of an emissions facility is responsible for submitting a complete test report as defined by Minn. R. 7017.2035. A test report may be rejected if it is deemed incomplete. As a result, this form is designed to ensure that your submittal is complete.

1) **Facility Name:** Gerdau Ameristeel

2) **AQ Facility ID Number** (first 8 digits of permit number): 12300055

3) **AQ File Number**: 1230055-11

4) **Facility Location Address:**

1678 Red Rock Road

City: St.Paul State: MN ZIP Code: 55119

5) **Date of Performance Test:** November 8. 2006

6) **Facility Contact Person (Individual who is designated to receive agency correspondence related to this test):**

Mr./Ms: Douglas Stolowski Phone: 651-731-5697

Title: Regional Environmental Affairs manager Fax: 651-731-5699

Mailing Address: 1678 Red Rock Road

City: St. Paul State: Mn ZIP Code: 55119

e-mail address: dstolowski@gerdauameristeel.com

7) **Test Report Check List:**

Cover:			
☑	Name and location (address) of the emission facility	☑	Date(s) of the performance test
☑	Identification of emission unit(s) tested (i.e. GP002, EU031, SV028, or CE001 – Identification of the tested unit which has the emission limit as designated by your permit (source designators))	☑	Name and address of the testing company or agency
☑	AQ Facility ID Number (first 8 digits of permit number) and AQ File Number	☑	Facility contact person (individual designated to receive agency correspondence), and contact information including title, address, phone number, fax number, and email address

Certification:

☑	Signed and dated certification statements as defined by Minn R. 7017.2040 (An exact duplicate must be included in the CD-ROM copy of the test report)

Introduction:

☑	Reason for testing (i.e. Permit condition, notice of violation, etc., including permit number or name of other applicable compliance document, include correct Rule citation as outlined in permit)	☑	Pollutants tested (for each emission unit tested)
☑	Test location and type of process including source designators as outlined in permit	☑	Observers names including industry and agency observers
☑	Test date(s)	☐	Changes from test plan, problems experienced during test and any other relevant background information

Summary of Results:
(see attached Table 1: Summary of Performance Test Results)

☑	Emission results expressed in the same units as the emission limits	☑	Description of collected samples
☑	Process data as related to determination of compliance (must include process rates, process parameters and pollution control equipment parameters that will be used to determine worst case operating conditions and pollution control equipment limitations during the test (see the relevant operator data forms at http://www.pca.state.mn.us/air/performancetest.html))	☑	Visible emissions summary if applicable
☑	Emission limits (as stated in your permit or applicable regulations) and applicable regulations citations as stated in your permit	☐	Discussion of errors, both real and apparent (If no errors occurred, verify by including statement)

Operating Parameters:
(see the relevant operator data forms at http://www.pca.state.mn.us/air/performancetest.html)

***Note:** *Readings of discrete data from monitoring instruments must be recorded at least every 15 minutes, or other reasonable time interval as approved, during the test and strip charts or retrieved electronic data from continuous monitors must be included in the*

test report.

☑	Description of process and air pollution control devices including emission unit(s) tested (i.e. GP002, EU031, SV028, or CE001 – Identification of the tested unit which has the emission limit as designated by your permit (source designators))	☑	Process data and results, with example calculations (Process data must be collected and averaged for each test run and averaged for each series of tests for each unit tested. Process data must be displayed in the same units that were used to determine worst case operating conditions during the test. Process data must be easily understood by personnel not familiar with the process.)
☑	Process and control equipment flow diagrams	☐	Any specially required operation demonstrations

Maintenance:

☐	Description including dates of all maintenance and operational inspections, including major cleaning operations and replacement, repair, or modification of functional components of process or control equipment done in the month prior to the test (Include a statement if no maintenance was performed)

Sampling and Analysis Procedures:

☑	Sampling port location and dimensioned cross section showing all flow disturbances including fans, elbows, dampers, constrictions and pollution control equipment. Measurements should be included on diagram(s).	☑	Brief description of sampling procedures and analytical methods, with discussion of deviations from standard methods (include a statement if no deviations were made), including a statement of source methods used, but not including complete copies of reference methods
☑	Description of sampling point (including duct orientation, number of test ports, number of sampling points, distances to upstream and downstream flow disturbances)	☑	If a method other than a US EPA reference method was used: a statement of the detection limit and the level of accuracy of the method under the conditions of the test and at the concentration of air pollutant that is reported.
☑	Description of sampling train		

Appendix:

☑	Complete results, including any fuel analysis, with example calculations, showing equations used and actual results in equation form on same or adjacent pages, using applicable equations shown in the reference method	☐	Test log (include test times, test interruptions and causes, and any other significant events related to the testing)
☑	Copies of raw field data	☑	Calibration procedures and results including pitot tube, nozzle, meter box, thermometer, barometer calibrations and any other equipment used to collect emissions samples. Instrument calibrations must be performed in accordance to the reference

			method used and calibration values must be displayed on the same data recorder from which emissions results are calculated.
☑	Laboratory report with chain of custody record	☑	Project participants and titles
☑	Raw production data, signed by plant official who can interpret, and be held accountable for the data	☑	A copy of the most recent version of the test plan and a copy of the commissioner's written approval of the test plan

Additional Information:

☐	Any other special requirement of the test method, test plan, applicable requirement or compliance document	☐	Any other information necessary to evaluate compliance with Minn R. parts 7017.2020 and 7017.2025 as requested by the commissioner.

REFERENCED TABLE

Table 1: Summary of Performance Test Results

1(a) Emission Unit Tested	1(b) Limitation Basis	1(c) Pollutant and Emission Limit	1(d) Test Result
EXAMPLE Boiler No. 3 (EU 042/ SV 440)	Minn. Stat. 116.07, subd. 4a	Particulate (B): 12 lbs/hour	Particulate (B): 4.1 lbs/hour
		VOC: 13 lbs/hour as carbon	VOC: 2.3 lbs/hour as carbon
	Title I Condition: 40 CFR § 52.21(j) (BACT limit); Minn. R. 7007.3000	Carbon Monoxide: 0.090 lbs/MMBtu	Carbon Monoxide: 0.00078 lbs/MMBtu
		Volatile Organic Compounds: 0.0090 lbs/MMBtu	Volatile Organic Compounds: 0.00050 lbs/MMBtu
	Title I Condition: 40 CFR § 52.21(k) (modeling); Minn. R. 7007.3000	Carbon Monoxide: 33.6 lbs/hour	Carbon Monoxide: 0.26 lbs/hour

Table References:
(A) Filterable particulate matter as determined by U.S. Environmental Protection Agency (EPA) Method 5.
(B) Filterable plus organic condensable particulate matter as determined by EPA Method 5 and Method 202/ Minn. R. 7011.0725.
(C) Particles with an aerodynamic diameter less than or equal to a nominal ten micrometers (PM_{10}) as determined by EPA Methods 5 and 202.

Performance Test Report Completeness Criteria

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

FORM -PTRCC01

03/24/06

INSTRUCTIONS FOR COMPLETING THIS FORM

1) Facility Name -- Enter your facility name.

2) AQ Facility ID No. -- Fill in your Air Quality Facility ID Number. This is the first eight digits of the permit number for all new permits issued under the new operating permit program. In the future, this number will replace the AQ File Number in item 3) below.

3) AQ File No. -- Fill in your AQ File Number. This is the first group of characters in your current Air Emission Facility Permit. For example, for permit number 1899AB-93-OT-1, the AQ Facility ID number would be 1899AB. Can be found in the upper right hand corner of the Test Plan Approval.

4) Facility Location -- Fill in the facility's street address and the city and county where the facility is located.

5) Date of Performance Test -- Enter the date of your performance test.

6) Facility Contact Person -- Fill in the contact information for the person that the MPCA may contact regarding this performance test.

7) Test Report Check List: This checklist is to ensures that your test submittal includes all of the required information.

REFERENCED TABLE:

1) Summary of Performance Test Results:

1a) Emission Unit Tested: As designated by permit (i.e. EU, SV, etc.)

1b) Limitation Basis: All applicable rule citations from permit that apply to tested unit(s).

1c) Pollutant and Emission Limit: Pollutant to be tested and emission limit as outlined in permit

1d) Test Result: State test result.

Brian Durkop

From: Stock, Curtis [Curtis.Stock@state.mn.us]
Sent: Wednesday, November 01, 2006 3:05 PM
To: dstolowski@gerdauameristeel.com; bdurkop@eagle-msi.com
Cc: Parr, Scott
Subject: TPAL for Gerdau Ameristeel Nov06

Attachments: TPAL for Gerdau Ameristeel Nov06.doc; PTRCC Mar06ver.doc


TPAL for Gerdau Ameristeel Nov...


PTRCC ar06ver.doc (242 KB

Douglas,

Attached is the Test Plan Approval Letter (TPAL) for the particulate matter testing to be conducted on the Ladle Refining Station and Electric Arc Furnace baghouses on November 8, 2006.

Please include a copy of the test plan, TPAL and this email in the final report.

Also attached is the Performance Test Report Completeness Criteria form.
Please use this to review the report prior to submitting it to the agency. The form is designed to help assure completeness of test reports and aid in efficient MPCA report review and compliance determination.

Contact me if you have any questions.

Curt Stock
Performance Test Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194

(651) 297-8480
(651) 296-8717 (fax)

Performance Test Plan Approval

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651) 296-6300
www.pca.state.mn.us

Gerdau Ameristeel – St. Paul

AQ# 151

Facility Name: Gerdau Ameristeel – St. Paul
Facility Contact: Douglas Stolowski
Address: 1678 Red Rock Road
St. Paul, Minnesota 55119
Phone: (651) 731-5697
Emission Unit(s): Ladle Refining Station (EU001, CE001) and Electric Arc Furnace (EU002, CE002)
Scheduled For: November 8, 2006, at your facility located in St. Paul, Minnesota.

Your test plan submitted on September 25, 2006, has been approved by the Minnesota Pollution Control Agency (MPCA) as follows:

☐ Shortened test notification approved

☒ Test plan approved without modification

☐ Test plan approved with the following provisions:

Particulate matter and PM_{10} emissions measured by Method 5D and 202 and opacity determined using Method 9.

Include in the final test report(s) all process and pollution control equipment operating data collected at 15 minute intervals and averaged for each test period. This information should be easily understood by individuals not familiar with the process.

Include in the final test report and CD-ROM copy; a signed certifications form, the test plan, this test plan approval letter (TPAL) and the email to which the TPAL was attached. The CD-ROM test report copy must be labeled with the AQ File Number, Company Name, Emission Unit Tested and Test Dates as stated on the submittal form. Only one paper copy and one CD-ROM/Microfiche copy of the test report are to be submitted.

Include in the final test report a simplified drawing of the test locations including pollution control equipment, stack orientation and test port locations.

Use of the PTRCC form will help assure that a complete test report is submitted to the agency

Obtain the required submittal and operating data forms from the website noted below.

Required Forms:

☐ Operating Data Summary- Combustion Sources
☒ Operating Data Summary- Process Sources
☒ Certifications Form
☒ Performance Test Report Completeness Criteria (PTRCC) (attached to email)
☐ Operating Data Summary- Asphalt Plants
☒ Microfiche/CD-ROM Submittal Form

Note: Forms are also available at: www.pca.state.mn.us/air/performancetest.html

Approved by:  **Date: 11/1/06**

Curtis Stock
Performance Test Coordinator
Compliance and Enforcement Section
Industrial Division

Please contact me at (651) 297-8480 if you have any questions regarding this approval.

Please be aware that enforcement action will be taken for performance test failures indicating emissions above applicable limits (excess actual emissions to the environment). Failures commonly result in assessment of a monetary penalty. Upon the first test failure, the Company should take immediate measures to minimize emissions. The measures taken should be documented, as they will become part of the record of corrective actions.

Hard Copy Performance Test Reports and Microfiche or CD Copy submittals will be addressed to: Compliance Tracking Coordinator, Compliance and Enforcement Unit, Industrial Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194

cc: Douglas Stolowski, Gerdau Ameristeel (email)
Drian Durkop, Eagle Mountain Scientific, Inc. (email)
Scott Parr, MPCA St. Paul (email)
AQ Correspondence File No. 151

TEST PLAN FOR MISCELLANEOUS SOURCES

Proposed test date(s): *November 8, 2006*
Date Test Plan Written: *September 20, 2006*

PART I. GENERAL INFORMATION

1. Name and street address of emission facility:
   Gerdau Ameristeel
   1678 Red Rock Road
   St. Paul, Minnesota 55119

   Name, Title, Telephone and Facsimile number of contact person at emission facility:
   Mr. Douglas Stolowski
   Regional Environmental Affairs Manager
   Phone: (612) 731-5697
   Fax: (612) 731-5699

2. Permit File Number: *#12300055-11*

3. Reason the emission unit(s) is (are) to be tested: *To demonstrate compliance with emission limitations set forth in the MPCA Permit #12300055-11.*

4. Physical description and location layout of emission unit(s) to be tested: *See Below*

Emission Point #1
Old Baghouse (Inlet duct) - 16 Points
Volumetric Flow Rate

See Attachment 1

Old Baghouse (Baghouse) - 108 Points
36 points per test
Particulate Sampling

3x3 Matrix in each of 12 compartments

3x3	3x3	3x3	3x3	3x3	3x3
3x3	3x3	3x3	3x3	3x3	3x3

Emission Point #2
New Baghouse (Inlet Duct) - 16 Points
Volumetric Flow Rate

See Attachment 2

New Baghouse (Baghouse) - 84 Points
28 points per test
Particulate Sampling

4x3 Matrix in each of seven compartments

4x3	4x3	4x3	4x3	4x3	4x3	4x3

5. Name of Independent Testing Company, contact person, and telephone number:
   Eagle Mountain Scientific, Inc.
   Brian Durkop
   Phone: (763) 477-4462
   Fax: (763) 477-5991
   Email: bdurkop@eagle-msi.com

PART II. TESTING REQUIREMENTS

1. The following is a description of the Pollutant(s) to be tested, and the applicable emission limit(s), and the applicable rule(s) or regulation(s) for each emission limit:

Pt. #	Limitation Basis	Pollutant Tested/Limit	Specific Methods
1	* See Footnote 1	PM, 0.0052 gr/dscf	EPA Method 5D and 202
1	* See Footnote 1	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
1	40 CFR 60.272a	Opacity, 3%	EPA Method 9
2	40 CFR 60.272a	PM, 0.0052 gr/dscf	EPA Method 5D and 202
2	* See Footnote 2	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
2	40 CFR 60.272a	Opacity, 3%	EPA Method 9

Footnote 1 – Limit emissions to those used for netting calculations.
Footnote 2 – Minnesota SIP modeled PM10 ambient air quality standard compliance.

Operating Data to be recorded during the Test:

1. Operating conditions of each source tested and its associated pollution control equipment will be documented in the test report. Documentation of operating conditions includes all parameters listed in Part III.

   Process conditions including baghouse pressure drops and fan amps will be recorded every 15 minutes during each test.

2. The following is a detailed description of the procedure for fuel sampling and analysis to be followed for the applicable emission unit. *NA*

PART III. OPERATING CONDITIONS

1. The following contains a detailed description of the emission unit(s) to be tested:

   Detailed descriptions of record keeping that include the specific time interval, and other parameters listed that will determine production, operating capacity, and/or operating conditions during testing are also included:

Emission Point No. 01: **Old Baghouse (Ladle Refining Station)**

Process Equipment Description for units to be tested:

Ladle Refining Station
Type: Ladle Refining Furnace
Mfr: Voest-Alpine Industries, Inc.
Capacity: 90 to 100 tons per heat
Continuous Casting Machine
Mfr: Mini-Castco
Capacity: 700,000 tons/year

Process Equipment Parameter Monitoring During Performance Test:

Tons per heat
Heat duration

Process Rates/Operating Conditions During Testing:

Batch process
Normal

Control Equipment Description:

Type: Fabric filter baghouse - positive pressure
Mfr: American Air Filter
Air Flow: 250,000 to 360,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Gas Temperature: 100 to 140 degrees F

Control Equipment Operating Parameter During Test: *(15 minute Intervals)*

Air Flow: 250,000 to 300,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Continuous Cleaning Cycle

Emission Point No. 02: **New Baghouse (Electric Arc Furnace)**

Process Equipment Description for units to be tested:

Type: Electric Arc Furnace
Mfr: Voest
Capacity: 90 to 100 ton heat size

Process Equipment Parameter Monitoring During Performance Test:

Tons per heat
Heat duration

Process Rates/Operating Conditions During Testing:

Batch process
Normal

Control Equipment Description:

Type: Fabric filter baghouse - positive pressure
Mfr: Amerex
Air Flow: 450,000 to 850,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Gas Temperature: 125 to 250 degrees F

Control Equipment Operating Parameter During Test: *(15 minute Intervals)*

Air Flow: 500,000 to 700,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Continuous Cleaning Cycle

2. For each process unit listed in Part III, Item 1, the normal range of process or operating rates for each emission unit are listed below. The proposed test conditions listed in Part III, Item

1, are considered worst case in accordance with Minn. R. 7017.2025, subpart 2 as indicated below:

Emission Point No. 01: Old Baghouse (Ladle Refining Station)

Normal Range of Process or Operating Rates Rationale For Worst Case

Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat
Maximum production rate

Emission Point No. 02: New Baghouse (Electric Arc Furnace)

Normal Range of Process or Operating Rates Rationale For Worst Case

Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat
Maximum production rate

PART IV. TEST METHODS

1. The following is a description of the methods, number of test runs, length of test runs, and sampling rate of each pollutant:

   A. EPA Method 1 for the location of sampling ports and points.
   B. EPA Method 2 for velocity and volumetric flow rate. One measurement just prior to each test run for TSP as PM10.
   C. EPA Method 3 for gas analysis. One test run on an integrated sample taken concurrently with each run for velocity and volumetric flow rate.
   D. EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for TSP as PM10.
   E. EPA Method 5D and 202 (TSP) for the concentration of particulate matter including organic condensable. Results are to be reported both as filterable particulate matter containing organic condensable (where the limit includes organic condensable), and as filterable particulate matter excluding organic condensable (where the limit does not include organic condensable). Run time: 120 minutes, Sample volume: 60 dscf (1.70 dscm) No. Runs: 3. TSP values will be reported as PM10 to meet the permits applicable emission standard.
   F. *EPA Method 9 as amended by Minn. R. 7017.2060 for visual determination of opacity. One-hour observation, concurrent with one test run for TSP as PM10.*

Justification for EPA 5D testing verses PM10 testing using EPA 201A

The emission points proposed to be tested are the old and new baghouses. These baghouses are of the single monovent positive pressure design. Flow determination at the sample location in

the baghouse compartments is not measurable using conventional testing equipment. In order to determine the flow in the baghouses, the inlet ducts must be measured prior to particulate sampling. These numbers are used to back calculate the flow in the baghouses at each sample point assuming that the flow is uniformly distributed throughout the baghouse.

Conducting method 201A using the cyclone is not technically possible due to limitations in its design. Prior to testing, the proper nozzle must be determined based on duct flow and other preliminary measurements. The cyclone design is based on 10 nozzles of various sizes. The proper nozzle necessary to conduct these tests is far larger than any nozzle provided with the cyclone.

PART V. CEM - *Not Applicable*

PART VI. OTHER

1. Pollutant(s) to be tested will be reported in terms of the applicable emission limit units.

2. Testing schedules and testing firm.

   Setup *Test EP1, EP2*

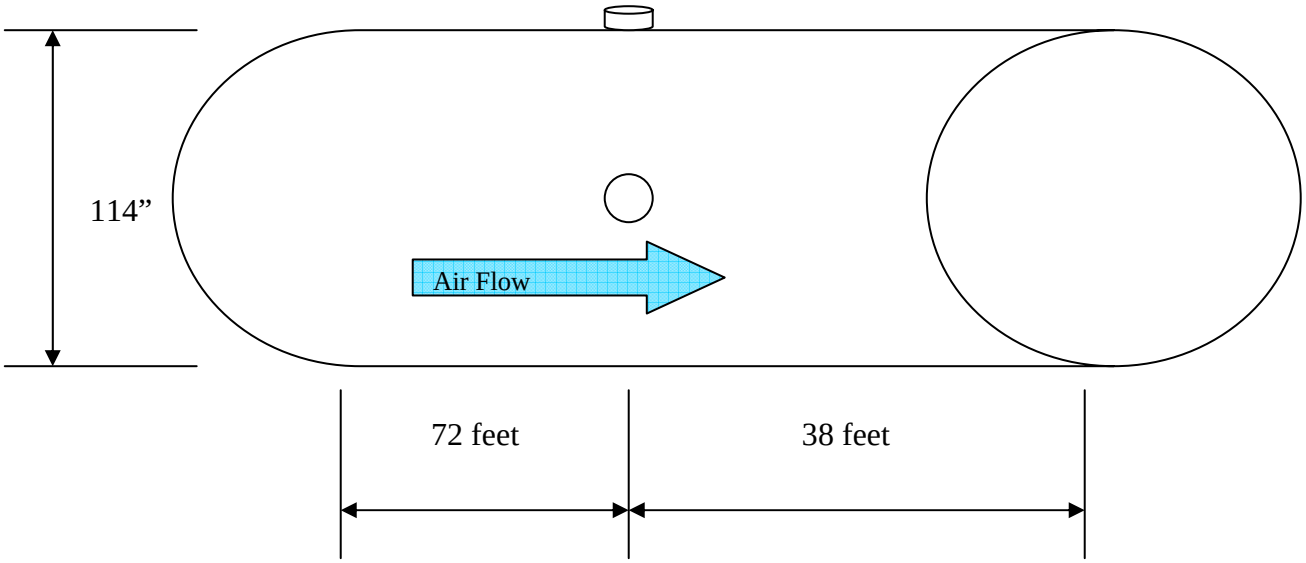
3. Description and date of last maintenance work done before the test: *A description of any maintenance work done before the test and the normal schedule followed will be included as part of the report.*

4. One complete test report (one hard copy) shall be submitted within 45 days after the date of the test. A copy of the report on CD-ROM (Upon Approval *.tif format) shall be submitted within 105 days after the date of the test.

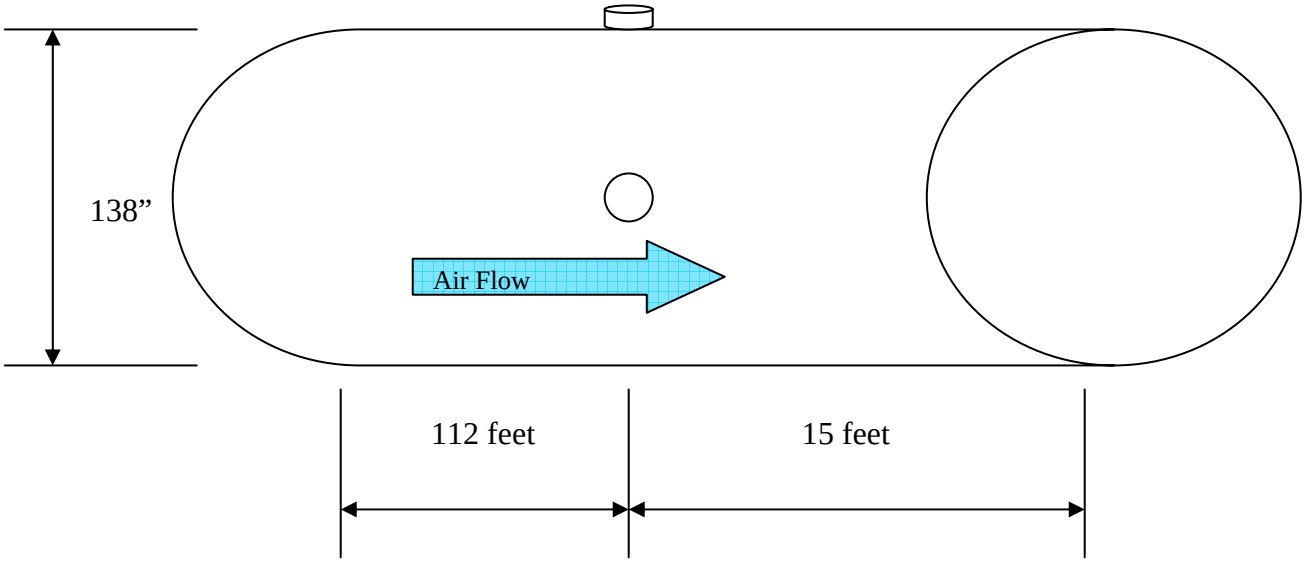
5. Test Plans, Hard Copy Reports, and Microfiche Copy submittals will be addressed to:

   Supervisor, Compliance Determination Unit
   Compliance & Enforcement Section/AQD
   Minnesota Pollution Control Agency
   520 Lafayette Road
   St. Paul, Minnesota 55155-4194

Attachment 1
Emission Point #1
Old Baghouse Inlet Duct



Attachment 2
Emission Point #2
New Baghouse Inlet Duct



Eagle Mountain Scientific, Inc.

Eagle Mountain Scientific Inc.

Results of the Compliance Test for Particulates as PM-10 and Opacity Gerdau Ameristeel, St. Paul Amerex (New) Baghouse

MPCA Permit File #12300055-11

Prepared for:

Mr. Doug Stankowski
Gerdau Ameristeel
1678 Red Rock Road
St. Paul, Minnesota 55119

Report # 902264(New)
October 4, 2005

Prepared By:

Brian Durkop

Brian Durkop
Project Manager

820-COMMONWEALTH DR •WARRENDALE • PENNSYLVANIA • 15086
PHONE: 724.742.2060 • FAX: 724.742.2066
8905 AUTUMN OAKS DRIVE • SUITE 2 • ROCKFORD • MINNESOTA • 55373
PHONE: 763.477.4462 • FAX: 763.477.5991

REPORT CERTIFICATIONS

1.) **Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**
"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DuKap Print Name: Brian DuKap
Title: Vice President Date: 11-14-05

2.) **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**
"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark Carlson Print Name: Mark Carlson
Title: Lab Analyst Date: 11-14-05

3.) **Certification of test report by senior staff person at the testing company who is responsible for compiling and checking the test report:**
"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DuKap Print Name: Brian DuKap
Title: Vice President Date: 11-14-05

4.) **Certification of test report by owner or operator of the emission facility:**
"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: Douglas Stolowski Print Name: Douglas Stolowski
Title: Environmental Date: 11-17-05

TABLE OF CONTENTS

SECTION 1.0

EXECUTIVE SUMMARY

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Gerdau Ameristeel facility located in St. Paul, Minnesota. The test was performed on October 4, 2005 to quantify particulate matter (to be reported as PM-10) and visible emissions from the New Baghouse (Amerex). The purpose of the test was to meet the requirements set forth in the Gerdau Ameristeel Permit to Operate (12300055-11). EMSI conducted U. S. EPA (EPA) and Minnesota Pollution Control Agency (MPCA) approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

The testing was performed by Mr. Brian Durkop, Mr. James Wilson, Mr. Mark Carlson, and Mr. Jerry Bovee. The process operating conditions were recorded by Gerdau Ameristeel plant personnel and EMSI.

1.1 Summary of Test Methods

Table 1.1
Gerdau Ameristeel - New Baghouse
October 4, 2005

METHOD	PURPOSE	RUN TIME	# OF RUNS
EPA 1	Determination of Traverse Points	NA	1
EPA 2	Determination of Velocity and Volumetric Flow	112 minutes	3
EPA 3	Determination of Molecular Weight	112 minutes	3
EPA 4	Determination of Moisture	112 minutes	3
EPA 5D	Determination of Particulate Matter	112 minutes	3
EPA 9	Determination of Opacity	60 minutes	1
EPA 202	Determination of Condensable Particulate Matter	NA	3

1.2 Summary of Test Results

Table 1.2
Gerdau Ameristeel - New Baghouse
October 4, 2005

POLLUTANT	RUN 1	RUN 2	RUN 3	AVERAGE	LIMIT
PM-10 (gr/dscf)	0.0014	0.0028	0.0005	0.0016	0.0052
Opacity (%)	0	NA	NA	0	3

1.3 Summary of Production

Table 1.3
Gerdau Ameristeel - New Baghouse
Particulates As PM10
October 4, 2005

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Production (tons/hr)	98.0	100.6	92.3	97.0

1.4 Summary of Report Organization

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectfully: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations and opacity certification, and the test plan.

SECTION 2.0

TEST RESULTS

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA. A copy of the test plan and approval letter are located in Appendix F.

2.1 Particulates

The results of the three tests performed for the determination of particulate matter with condensables are reported in Table 2.1. The electric arc furnace operates on a batch process, so to achieve a worst case-operating scenario, between heats when the process is down sampling was stopped.

Table 2.1
Gerdau Ameristeel- New Baghouse
Particulate Test Results
October 4, 2005

Client: *Gerdau Ameristeel* **Plant:** *St. Paul*
Date(s): *October 4, 2005* **EPA Method(s):** *1-5D, 202*

Run #:	Run 1	Run 2	Run 3	
Date:	10/4/2005	10/4/2005	10/4/2005	
Time:	10:13-12:48	15:09-17:22	17:44-20:04	Average
Production				
Steel (tons/hr)	98.0	100.6	92.3	97.0
Control Equipment (monovent baghouse)				
DP 1 (inH20)	8.11	6.25	5.61	6.66
DP 2 (inH20)	3.62	3.60	3.61	3.61
DP 3 (inH20)	5.24	4.74	4.62	4.87
DP 4 (inH20)	Cleaning	3.70	4.06	3.88
DP 5 (inH20)	5.65	4.96	4.30	4.97
DP 6 (inH20)	5.99	5.10	4.44	5.18
DP 7 (inH20)	4.14	3.37	3.05	3.52
Fan #1 (Amps)	0.00	0.00	0.00	0.00
Fan #2 (Amps)	170.00	163.00	183.00	172.00
Fan #3 (Amps)	171.00	163.00	181.00	171.67
Duct Conditions				
Stack Temp (°F)	172	232	166	190
Oxygen (%)	19.8	19.8	19.8	19.8
Carbon Dioxide (%)	1.1	1.1	1.1	1.1
Moisture (%)	1.9	1.9	1.9	1.9
Mol Weight, Dry	28.9	28.9	28.9	28.9
Stack Press (inH20)	-11.00	-11.00	-11.00	-11.00
Stack Area (ft2)	103.87	103.87	103.87	103.87
Stack Vel (ft/sec)	94.3	93.5	87.4	91.7
Stack Flow (wacfm)	587,369	582,886	544,559	571,605
Stack Flow (wscfm)	465,470	421,879	435,075	440,808
Stack Flow (dscfm)	456,626	413,864	426,808	432,433

Baghouse Conditions

Nozzle (inches)	1.215	1.215	1.215	1.215
Stack Temp (°F)	184	188	200	191
Oxygen (%)	19.8	19.8	19.7	19.8
Carbon Dioxide (%)	1.1	1.2	1.2	1.2
Moisture (%)	2.6	2.9	3.1	2.9
Mol Weight, Dry	29.0	29.0	29.0	29.0
Stack Press (inH20)	-0.18	0.19	0.30	0.10
Stack Area (ft2)	4914.76	4914.76	4914.76	4914.76
Stack Vel (ft/sec)	2.0	1.8	1.9	1.9
Stack Flow (wacfm)	596,303	540,105	564,616	567,008
Stack Flow (wscfm)	476,528	429,186	439,505	448,406
Stack Flow (dscfm)	463,947	416,918	425,779	435,548

Test Results - Total Particulate Matter

Sample Gas Vol (dscf)	83.116	75.316	78.536	78.989
Isokinetics (%)	97.6	98.5	100.5	98.9
Filter (mg)	0.0	0.0	0.0	0.0
Probe Rinse (mg)	2.7	5.4	0.0	2.7
Aqueous (mg)	5.0	8.4	2.3	5.2
Organic (mg)	0.0	0.0	0.0	0.0
Total (mg)	7.7	13.8	2.3	7.9
Filterable (lbs/hr)	1.993	3.953	0.000	1.982
Aqueous (lbs/hr)	3.691	6.150	1.649	3.830
Organic (lbs/hr)	0.000	0.000	0.000	0.000
Total (lbs/hr)	5.685	10.103	1.649	5.812
Filterable (gr/dscf)	0.0005	0.0011	0.0000	0.0005
Aqueous (gr/dscf)	0.0009	0.0017	0.0005	0.0010
Organic (gr/dscf)	0.0000	0.0000	0.0000	0.0000
Total (gr/dscf)	0.0014	0.0028	0.0005	0.0016

2.2 Opacity

Mr. Mark Carlson conducted the visible emission observations. Whitlow Enterprises certified Mr. Carlson. A copy of his current certification certificate is located in Appendix E.

Table 2.2
Gerdau Ameristeel- New Baghouse
Opacity Test Results
October 4, 2005

Client: *Gerdau Ameristeel* **Plant:** *St. Paul*
Date(s): *October 4, 2005* **EPA Method(s):** *9*

Run #:	Run 1
Date:	10-4-05
Time:	11:40-12:40

Production

Steel (tons/hr)	98.0

Control Equipment (monovent baghouse)

DP 1 (inH20)	8.11
DP 2 (inH20)	3.62
DP 3 (inH20)	5.24
DP 4 (inH20)	Cleaning
DP 5 (inH20)	5.65
DP 6 (inH20)	5.99
DP 7 (inH20)	4.14
Fan #1 (Amps)	0.00
Fan #2 (Amps)	170.00
Fan #3 (Amps)	171.00

SECTION 3.0

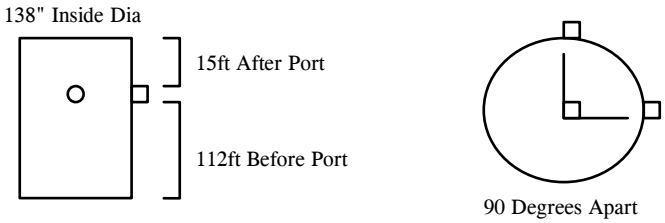
TEST PROCEDURES

3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

Inlet Duct

Number of Ports:	2
Inside Diameter:	138 inches
Area:	103.866 cubic feet
Distance Upstream of Ports:	112 feet
Distance Downstream of Ports:	15 feet
Total Number of Points:	16
Number of Points per Diameter:	8

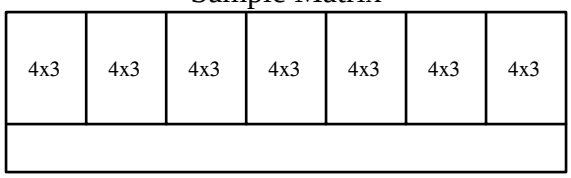


Point 1	4.6	inches
Point 2	14.4	inches
Point 3	26.8	inches
Point 4	44.6	inches
Point 5	93.4	inches
Point 6	111.2	inches
Point 7	123.6	inches
Point 8	133.4	inches

Baghouse (Outlet)

Each compartment was divided into a 4 x 3 matrix for a total number of points for each compartment being 12. Run 1 sampled at points 1-4 in each of the seven compartments for a total of 28 points. Run 2 followed by sampling at 5-8 in each compartment, and finally Run 3 sampled at points 9-12.

Sample Matrix



Number of Compartments:	7
Total Area of Baghouse:	4914.76 cubic feet
Total Number of Points:	84
Number of Points Per Run:	28
Run 1 points:	1 to 4 in seven compartments
Run 2 points:	5 to 8 in seven compartments
Run 3 points:	9 to 12 in seven compartments

Baghouse Dimensions

Compartment Number	Compartment Depth	Compartment Width	Number of Beams	Number of Doors	Compartment Area (ft2)
1	28'11"	24'10.5"	5	1	717.213
2	28'11"	23'11.5"	4	1	690.805
3	28'11"	24'0"	4	1	692.011
4	28'11"	23'11.5"	4	1	690.805
5	28'11"	24'0.5"	4	1	693.217
6	28'11"	23'11.5"	4	1	690.805
7	28'11"	25'8"	7	1	739.906
Total Baghouse Exhaust Area					4,914.762

3.2 Determination of Particulate Matter

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 2-5D
Code of Federal Regulations, Title 40, Part 51, Appendix M, Methods 202

Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a glass fiber filter. The exit to the filter holder was connected to the impinger train which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample. Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of 250 ±25°F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

Sample Recovery

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of: the nozzle, the probe liner; and the front half of the filter holder. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a labeled, clean polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impingers were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch and rinses of the impingers and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.

At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of containers as were used for sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tared beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weighings agreed to within 0.5 mg.

Prior to analysis, back half fraction and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride or chloroform/ether and analyzed gravimetrically. Each sample was extracted three times with 25 ml of methylene chloride or 75ml chloroform/ 75ml ether in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic (solvent) and aqueous (water) fractions were placed in individual tared beakers. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point. After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weighings agreed to within 0.5 mg.

3.3 Determination of Opacity

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9

Positioning of the observer

The opacity of the plume as viewed by the observer can be influenced due to several variables with respect the position of the observer. The position of the observer with respect to the sun. Position of the observer with respect to the observation point. Attached or detached steam plumes. Position of the observer with respect to a rectangular stack with high length to width ratios.

The acceptable criteria for the position the observer is outlined in Method 9 as follows:

1) The observer must maintain a position with the sun located at a 140° arc to the observers back.

2) The observer must maintain an angle of <18° with respect to the observation point.

3) The observer must read the opacity where a steam plume does not interfere. Between the stack and the steam plume if the steam plume in detached from the stack. After the steam plume if the steam plume is attached from the stack.

4) The observer must read a rectangular stack at a point where the stack has the shortest cross sectional diameter.

Visible Emission Readings

A test for visible emission requires 480 consecutive reading. Each reading is recorded in 15-second intervals for 60-minutes. The percent opacity is recorded in 5 percent increments for 0 to 100. The observer must record the results on a data sheet as outlined in Method 9. (ie. position of the observer, date, time, process information, location of the stack, and the 15-second opacity readings). The determination of opacity is calculated using a 6-minute rolling average.

Appendix A

Field Data Sheets

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5D	Date	10-4-05
Facility	St. Paul	Test Number	1	Job #	902264
Unit	New Baghouse	Description	TSP	Page	1 of 3
Location	Compartment 3	Start/Stop Time	1013 – 1248	Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	2010-5	
Pbar	29.17	In Hg	Nozzle Dia. (in)	1.215	
K-Factor			Filter #		
Mol. WT		g/mole	del H @	1.592	
Pstack	-0.18	In H2O	Meter Factor	0.968	
Sample Time	112	min	Pitot Coeff.	0.84	

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1	697.9	687.8	
#2	721.2	715.0	
#3	635.3	628.4	
#4	763.8	739.2	
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test	0.04	10	BD	848
Post-Test	0.0	8	BD	1253

Run	1	2	3	Avg.
O2	19.8			
CO2	1.1			

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		0			32.353								
1	1	4	0.00103	1.75	35.5	5	149	246	250	58	71	69	
1	2	8			38.65	5	173	239	251	57	71	69	
1	3	12			41.8	5	189	245	251	56	72	69	
1	4	16			45.000	5	191	247	251	56	72	70	TAP1024
2	1	20			48.0	5	187	248	253	58	77	73	1037 ON
2	2	24			51.2	5	196	249	252	54	79	74	
2	3	28			54.4	5	196	248	251	55	79	74	
2	4	32			57.632	5	190	248	251	54	81	75	
3	1	36			60.9	5	153	249	252	55	82	77	
3	2	40			64.0	5	178	248	248	54	83	78	
3	3	44			67.2	5	202	247	248	55	83	75	
3	4	48			70.451	5	205	251	250	56	83	78	
Total/Avg.		48											

T1

1	5	9
2	6	10
3	7	11
4	8	12

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5 D	Date	10-4-05
Facility	St. Paul	Test Number	1	Job #	902264
Unit	New Baghouse	Description	TSP	Page	2 of 3
Location		Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #		
Pbar		In Hg	Nozzle Dia. (in)		
K-Factor			Filter #		
Mol. WT		g/mole	del H @		
Pstack		In H2O	Meter Factor		
Sample Time	112	min	Pitot Coeff.		

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		48											
4	1	52	0.00103	1.75	73.20	5	205	247	250	63	82	79	
4	2	56			76.25	5	200	246	251	60	82	79	
4	3	60			80.0	5	193	251	254	57	80	78	1129 TAP
4	4	64			83.2	5	191	251	253	55	80	78	H45 on
5	1	68			86.5	5	159	250	246	58	80	78	
5	2	72			89.8	5	175	252	251	56	80	78	
5	3	76			93.0	5	182	250	251	55	80	78	
5	4	80			96.014	5	191	250	249	56	80	78	
6	1	84			99.0	5	196	251	248	59	80	78	
6	2	88			102.4	5	201	251	250	58	80	78	
6	3	92			105.6	5	204	252	251	56	80	78	
6	4	96			107.211	5	188	252	251	57	80	78	
Total/Avg.		96											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5 D	Date	10-4-05
Facility	St. Paul	Test Number	1	Job #	902264
Unit	New Baghouse	Description	TSP	Page	3 of 3
Location		Start/Stop Time		Operator	

PRE-TEST DATA

Tamb		°F	Meter Box #		
Pbar		In Hg	Nozzle Dia. (in)		
K-Factor			Filter #		
Mol. WT		g/mole	del H @		
Pstack		In H2O	Meter Factor		
Sample Time	112	min	Pitot Coeff.		

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
							Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
		96											
7	1	100	0.00103	1.75	111.95	5	169	248	251	62	79	78	
7	2	104	↓	↓	115.2	5	160	247	249	60	79	77	
7	3	108			118.4	5	166	249	250	57	79	77	
7	4	112			121.628	5	157	249	245	56	79	77	
Total/Avg.		112											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5D	Date	10-4-05
Facility	St. Paul	Test Number	2	Job #	902264
Unit	New Baghouse	Description	TSP	Page	1 of 3
Location	Compartment	Start/Stop Time	1509 - 1722	Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	2010-5
Pbar	29.17	In Hg	Nozzle Dia. (in)	1.215
K-Factor			Filter #	
Mol. WT		g/mole	del H @	1.592
Pstack	+.19	In H2O	Meter Factor	0.968
Sample Time	112	min	Pitot Coeff.	0.84

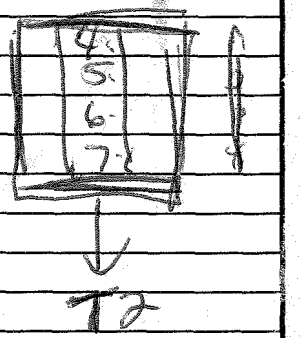
MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1	707.5	689.1	
#2	722.6	[illegible]	717.6
#3	580.3	577.6	
#4	826.3	805.4	
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test	0.015	10	BD	1310
Post-Test	0	10	BD	1730

Run	1	2	3	Avg.
O2	[illegible]			19.8
CO2				1.2

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		0			22.607								
1	1	4	0.00084	1.42	25.0	4	149	250	250	66	80	79	
1	2	8			27.85	4	207	254	250	56	81	79	
1	3	12			30.6	4	213	251	255	57	82	79	
1	4	16			33.5	4	224	252	253	56	82	80	
2	1	20			36.5	4	193	251	252	55	83	81	
2	2	24			39.4	4	202	251	249	56	84	81	
2	3	28			42.3	4	195	252	249	56	84	81	
2	4	32			45.2	4	185	249	253	55	84	82	
3	1	36			48.3	4	159	244	250	59	85	82	
3	2	40			51.05	4	163	245	249	53	85	82	
3	3	44			54.0	4	161	245	249	53	85	83	
3	4	48			57.171	4	153	245	248	55	85	83	
Total/Avg.		48											



Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5D	Date	10-4-05
Facility	St. Paul	Test Number	2	Job #	902264
Unit	New Baghouse	Description	TSP	Page	2 of 3
Location		Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #		
Pbar		In Hg	Nozzle Dia. (in)		
K-Factor			Filter #		
Mol. WT		g/mole	del H @		
Pstack		In H2O	Meter Factor		
Sample Time	112	min	Pitot Coeff.		

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
							Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
		48											
4	1	52	0.00084	1.42	60.1	4	147	250	248	62	85	83	
4	2	56			62.9	4	158	244	250	57	85	83	
4	3	60			66.5	4	177	248	249	55	86	83	
4	4	64			68.918	4	156	247	248	59	86	83	
5	1	68			71.2	4	158	252	251	54	86	83	
5	2	72			74.8	4	190	254	250	55	86	83	
5	3	76			77.55	4	199	251	250	54	86	83	
5	4	80			80.71	4	205	251	250	54	86	83	
6	1	84			83.5	4	215	252	251	58	87	84	
6	2	88			86.3	4	218	251	250	54	87	85	
6	3	92			89.4	4	224	251	250	55	87	85	
6	4	96			92.2	4	221	250	253	58	88	85	
Total/Avg.		96											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5D	Date	10-4-05
Facility	St. Paul	Test Number	2	Job #	902264
Unit	New Baghouse	Description	TSP	Page	3 of 3
Location		Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	2	Impinger	End	Start	Dif.	Leak Check	CFM	VAC.	INIT	TIME
Pbar		In Hg	Nozzle Dia. (in)		#1				Pre-Test				
K-Factor			Filter #		#2				Post-Test				
Mol. WT		g/mole	del H @		#3				Run	1	2	3	Avg.
Pstack		In H2O	Meter Factor		#4				O2				
Sample Time	112	min	Pitot Coeff.		Total				CO2				

MATERIAL WEIGHT (g)

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
							Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
		96											
7	1	100	0.00084	1.42	95.2	4	194	249	251	58	88	86	
7	2	104	↓	↓	98.1	4	201	248	251	54	88	86	
7	3	108			101.0	4	199	248	251	54	88	86	
7	4	112			103.945	4	199	247	252	58	88	86	
Total/Avg.		112											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5	Date	10-4-05
Facility	St. Paul	Test Number	3	Job #	902264
Unit	New Baghouse	Description	TSP	Page	1 of 3
Location	Compartment 3	Start/Stop Time	1744 - 2004	Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #	2010-5
Pbar	29.17	In Hg	Nozzle Dia. (in)	1.215
K-Factor			Filter #	
Mol. WT		g/mole	del H @	1.592
Pstack	+.20	In H2O	Meter Factor	0.965
Sample Time	112	min	Pitot Coeff.	0.84

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1	729.2	717.8	
#2	703.3	692.4	
#3	635.1	631.0	
#4	780.2	752.8	
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test	.004	10	BD	1742
Post-Test				

	1	2	3	Avg.
O2				19.7
CO2				1.2

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		0			4.131								
1	1	4	0.00090	1.53	7.30	4	179	251	252	56	85	84	
1	2	8			10.15	4	205	252	253	52	85	84	
1	3	12			13.2	4	210	256	251	53	85	84	
1	4	16			16.243	4	209	253	247	53	85	84	
2	1	20			19.4	4	179	250	249	58	85	84	
2	2	24			22.4	4	206	251	248	57	85	84	
2	3	28			25.3	4	206	252	247	56	85	83	
2	4	32			28.410	4	207	251	248	52	85	84	
3	1	36			31.45	4	204	248	243	59	84	83	
3	2	40			34.50	4	200	247	249	56	84	83	
3	3	44			37.60	4	191	246	249	54	84	83	
3	4	48			41.001	4	203	247	250	56	84	83	
Total/Avg.		48											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5 D	Date	10-4-05
Facility	St. Paul	Test Number	3	Job #	902264
Unit	New Baghouse	Description	TSP	Page	2 of 3
Location		Start/Stop Time		Operator	BD

PRE-TEST DATA

Tamb		°F	Meter Box #			
Pbar		In Hg	Nozzle Dia. (in)			
K-Factor			Filter #			
Mol. WT		g/mole	del H @			
Pstack		In H2O	Meter Factor			
Sample Time	112	min	Pitot Coeff.			

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F Stack	Probe	Filter	Imp Out	Meter In	Meter Out	Comments/Observations
		48											
4	1	52	0.00090	1.53	43.7	4	211	251	252	60	84	83	
4	2	56			47.1	4	212	250	251	52	84	83	
4	3	60			49.8	4	220	248	251	53	84	82	
4	4	64			52.883	4	225	247	250	54	84	83	TAP
5	1	68			55.61	4	187	247	251	52	81	81	
5	2	72			59.1	4	196	248	251	56	81	81	
5	3	76			62.1	4	199	249	251	55	81	81	
5	4	80			65.1	4	208	248	246	52	81	81	
6	1	84			68.2	5	186	249	249	59	81	81	
6	2	88			71.2	5	183	248	250	51	81	80	
6	3	92			74.4	5	183	245	249	53	81	80	
6	4	96			77.3	5	195	248	249	54	81	80	
Total/Avg.		96											

Eagle Mountain Scientific Inc.

STACK TEST DATA SHEET

Client	Gerdau Ameristeel	Test Method	EPA 5D	Date	10-4-05
Facility	St. Paul	Test Number	3	Job #	902264
Unit	New Baghouse	Description	TSP	Page	3 of 3
Location		Start/Stop Time		Operator	

PRE-TEST DATA

Tamb		°F	Meter Box #		
Pbar		In Hg	Nozzle Dia. (in)		
K-Factor			Filter #		
Mol. WT		g/mole	del H @		
Pstack		In H2O	Meter Factor		
Sample Time	112	min	Pitot Coeff.		

MATERIAL WEIGHT (g)

Impinger	End	Start	Dif.
#1			
#2			
#3			
#4			
Total			

Leak Check	CFM	VAC.	INIT	TIME
Pre-Test				
Post-Test				

Run	1	2	3	Avg.
O2				
CO2				

Sample Point		Time (min)	del P (In H2O)	del H (In H2O)	Meter Reading (acf)	Vacuum (In Hg)	Temperature °F						Comments/Observations
							Stack	Probe	Filter	Imp Out	Meter In	Meter Out	
		96											
7	1	100	0.00090	1.53	80.35	4	196	249	248	53	81	81	
7	2	104	〃	〃	83.4	4	204	250	249	54	81	81	
7	3	108	〃	〃	86.4	5	210	251	250	56	81	81	
7	4	112	〃	〃	89.495	5	209	250	251	55	81	81	
Total/Avg.		112											

Eagle Mountain Scientific Inc.

VELOCITY TRAVERSE DATA SHEET

Client Gerdau Ameristeel Date 10-4-05 Facility St.Paul

Job Number 902264 Unit New Baghouse Operator(s) MK/JB

Location Inlet Fuel Type

Test No. 1 Stack %O_2 ~~21.5~~ 19.8

Barometric Pressure (in.Hg) 29.17 Stack %CO_2 ~~0.5~~ 1.1

Stack Pressure (P_s) (in. H_2O) -11.0 Test Description Flow

Pitot Tube Coefficient (Cp) .84

Traverse Point		Time	ΔP (in.H_2O)	T_s(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
H	1	839	1.8	144		
	2		1.8	148		
	3		2.1	172		
	4		2.5	175		
	5		2.3	173		
	6		2.2	180		
	7		2.3	182		
	8		2.1	189		
V	1		2.3	144		
	2		2.2	166		
	3		2.5	173		
	4		2.5	174		
	5		2.4	178		
	6		2.3	180		
	7		2.3	174		
	8	848	1.8	191		

$$V_s = 85.48\ C_P \sqrt{\frac{(T_s + 460)\ \Delta P}{(P_s/13.6 + P_{BAR})\ M_{fg}}}$$

$$M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$$

Eagle Mountain Scientific Inc.

VELOCITY TRAVERSE DATA SHEET

Client Gerdau Ameristeel Date 10-4-05 Facility St.Paul

Job Number 902264 Unit New Baghouse Operator(s) MC / JB

Location Inlet Fuel Type

Test No. 2 Stack %O_2 19.8

Barometric Pressure (in.Hg) 29.17 Stack %CO_2 1.1

Stack Pressure (P_s) (in. H_2O) -11.0 Test Description Flow

Pitot Tube Coefficient (Cp) .84

Traverse Point		Time	ΔP (in.H_2O)	T_s(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
A	1	1028	1.9	223		
	2		2.1	243		
	3		2.0	249		
	4		2.2	260		
	5		2.0	263		
	6		1.9	264		
	7		1.9	262		
	8		1.7	261		
B	1		2.0	187		
	2		2.1	197		
	3		2.2	210		
	4		2.2	222		
	5		2.0	214		
	6		2.1	216		
	7		1.8	217		
	8	1037	1.7	216		

$V_S = 85.48\ C_P \sqrt{\frac{(T_s + 460)\ \Delta P}{(P_s/13.6 + P_{BAR})\ M_{fg}}}$

$M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$

Eagle Mountain Scientific Inc.

VELOCITY TRAVERSE DATA SHEET

Client Gerdau Ameristeel Date 10-4-05 Facility St. Paul

Job Number 902264 Unit New Baghouse Operator(s) MC/JB

Location Inlet Fuel Type

Test No. 3 Stack %O_2 19.8

Barometric Pressure (in.Hg) 29.17 Stack %CO_2 1.8

Stack Pressure (P_S) (in. H_2O) -11.0 Test Description Flow

Pitot Tube Coefficient (Cp) .84

Traverse Point		Time	ΔP (in.H_2O)	T_S(°F)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
H	1	1534	2.1	173		
↓	2		1.9	181		
	3		2.2	187		
	4		2.1	183		
	5		2.0	176		
	6		1.8	171		
	7		1.8	169		
↓	8		1.6	177		
V	1		1.9	145		
↑	2		2.0	155		
	3		2.2	157		
	4		2.1	156		
	5		1.6	154		
	6		1.9	157		
↓	7		2.1	162		
↓	8	1542	1.4	160		

$V_S = 85.48\ C_P \sqrt{\frac{(T_S + 460)\ \Delta P}{(P_S/13.6 + P_{BAR})\ M_{fg}}}$

$M_{fg} = 0.440\ (\%CO_2) + 0.320\ (\%O_2) + 0.280\ (100 - \%O_2 - \%CO_2)$

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number: 0011 | Page 1 of 2

Continued on VEO Form Number: 002

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Company Name: Gerdau Ameristeel

Facility Name: St. Paul

Street Address: 1678 Red Rock Road

City: St Paul | State: MN | Zip: 55119

Process: EAF | Unit #: New | Operating Mode: Normal

Control Equipment: Baghouse | Operating Mode: Normal

Describe Emission Point: Southernmost baghouse w/only one exit

Height of Emiss. Pt. Start: ~150' End: ~150' | Height of Emiss. Pt. Rel. to Observer Start: ~45' End: ~150'

Distance to Emiss. Pt. Start: ~2000' End: ~2000' | Direction to Emiss. Pt. (Degrees) Start: 350° End: 350°

Vertical Angle to Obs. Pt. Start: 30° End: 30° | Direction to Obs. Pt. (Degrees) Start: 350° End: 350°

Distance and Direction to Observation Point from Emission Point Start: above baghouse exit End: same

Describe Emissions Start: None End: None

Emission Color Start: None End: None | Water Droplet Plume: Attached ☐ Detached ☐ None ☒

Describe Plume Background

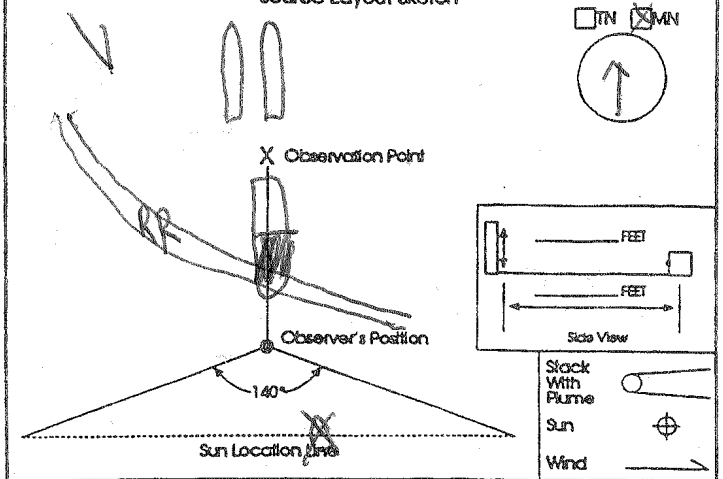
Background Color Start: Gray End: Gray | Sky Conditions Start: Overcast End: Overcast

Wind Speed Start: 5-10 End: 5-10 | Wind Direction Start: NW End: NW

Ambient Temp. Start: 65 End: 65 | Wet Bulb Temp. | RH Percent: 82

Source Layout Sketch

Draw North Arrow: ☐ TN ☒ MN



Longitude | Latitude | Declination

Additional Information

Observation Date: 10-4-05 | Time Zone: Central | Start Time: 1140 | End Time: 1210

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Mark Carlson

Observer's Signature: Mark Carlson | Date: 10-4-05

Organization: EMSI

Certified By: Whitlow Enterprise | Date: 3-25-05

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number			0	0	2	Page 2 of 2
Continued on VEO Form Number						

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Company Name

Facility Name

Street Address

City | State | Zip

Process | Unit # | Operating Mode

Control Equipment | Operating Mode

Describe Emission Point

Height of Emiss. Pt. — Start | End

Height of Emiss. Pt. Rel. to Observer — Start | End

Distance to Emiss. Pt. — Start | End

Direction to Emiss. Pt. (Degrees) — Start | End

Vertical Angle to Obs. Pt. — Start | End

Direction to Obs. Pt. (Degrees) — Start | End

Distance and Direction to Observation Point from Emission Point — Start | End

Describe Emissions — Start | End

Emission Color — Start | End

Water Droplet Plume — Attached ☐ Detached ☐ None ☐

Describe Plume Background — Start | End

Background Color — Start | End

Sky Conditions — Start | End

Wind Speed — Start | End

Wind Direction — Start | End

Ambient Temp. — Start | End

Wet Bulb Temp.

RH Percent

Source Layout Sketch

Draw North Arrow ☐TN ☐MN

X Observation Point

Observer's Position

140°

Sun Location Line

FEET

FEET

Side View

Stack With Plume

Sun

Wind

Longitude | Latitude | Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time
10-4-05	Central	1210	1240

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0		
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): Mark Carlson

Observer's Signature: Mark Carlson — Date: 10-4-05

Organization: EMSI

Certified By: Whitlow — Date: 3-25-05

Appendix B

Calculated Field Data Results

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	1	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	-0.18 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	47.8 g	Ref Tmp =	68
Avg. O2 =	19.8 %	Avg. CO2 =	1.1 %		

Data	Time	Del P	Del H	Meter	Vacuum	Temperatures (_F)				
Point	(min)	(in. H2O)	(in. H2O)	(ACF)	(in. Hg)	Stack	Probe	Filter	Dryer	Meter In
New-0	0			32.353						
New-1	4	0.00103	1.75	35.500	5	149	246	250	58	71
New-2	8	0.00103	1.75	38.650	5	173	239	251	57	71
New-3	12	0.00103	1.75	41.800	5	189	245	251	56	72
New-4	16	0.00103	1.75	45.000	5	191	247	251	56	72
New-5	20	0.00103	1.75	48.000	5	187	248	253	58	77
New-6	24	0.00103	1.75	51.200	5	196	249	252	54	79
New-7	28	0.00103	1.75	54.400	5	196	248	251	55	79
New-8	32	0.00103	1.75	57.632	5	190	248	251	54	81
New-9	36	0.00103	1.75	60.900	5	153	249	252	55	82
New-10	40	0.00103	1.75	64.000	5	178	248	248	54	83
New-11	44	0.00103	1.75	67.200	5	202	247	248	55	83
New-12	48	0.00103	1.75	70.451	5	205	251	250	56	83
New-13	52	0.00103	1.75	73.200	5	205	247	250	63	82
New-14	56	0.00103	1.75	76.750	5	200	246	251	60	82
New-15	60	0.00103	1.75	80.000	5	193	251	254	57	80
New-16	64	0.00103	1.75	83.200	5	191	251	253	55	80
New-17	68	0.00103	1.75	86.500	5	159	250	246	58	80
New-18	72	0.00103	1.75	89.800	5	175	252	251	56	80
New-19	76	0.00103	1.75	93.000	5	182	250	251	55	80
New-20	80	0.00103	1.75	96.014	5	191	250	249	56	80
New-21	84	0.00103	1.75	99.000	5	196	251	248	59	80
New-22	88	0.00103	1.75	102.400	5	201	251	250	58	80
New-23	92	0.00103	1.75	105.600	5	204	252	251	56	80
New-24	96	0.00103	1.75	107.211	5	188	252	251	57	80
New-25	100	0.00103	1.75	111.950	5	169	248	251	62	79
New-26	104	0.00103	1.75	115.200	5	160	247	249	60	79
New-27	108	0.00103	1.75	118.400	5	166	249	250	57	79
New-28	112	0.00103	1.75	121.628	5	157	249	245	56	79
Ave./Total	112	0.00103	1.75	89.275	5	184	249	250	57	79

Calculated Data and Test Results :

Sample Gas Volume =	83.116	DSCF
Water Vapor =	2.254	SCF
Moisture Content =	2.64	%
Average Stack Velocity =	2.0	ft/sec
Stack Flow =	596303	WACFM
	476528	WSCFM
	463947	DSCFM

% Isokinetic = 97.6 %

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	2	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	0.19 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	47.0 g	Ref Tmp =	68
Avg. O2 =	19.8 %	Avg. CO2 =	1.2 %		

Data Point	Time (min)	Del P (in. H2O)	Del H (in. H2O)	Meter (ACF)	Vacuum (in. Hg)	Temperatures (_F) Stack	Probe	Filter	Dryer	Meter In
New-0	0			22.007						
New-1	4	0.00084	1.42	25.000	4	149	250	250	66	80
New-2	8	0.00084	1.42	27.850	4	207	254	250	56	81
New-3	12	0.00084	1.42	30.600	4	213	251	255	57	82
New-4	16	0.00084	1.42	33.500	4	224	252	253	56	82
New-5	20	0.00084	1.42	36.500	4	193	251	252	55	83
New-6	24	0.00084	1.42	39.400	4	202	251	249	56	84
New-7	28	0.00084	1.42	42.300	4	195	252	249	56	84
New-8	32	0.00084	1.42	45.200	4	185	249	253	55	84
New-9	36	0.00084	1.42	48.300	4	159	244	250	59	85
New-10	40	0.00084	1.42	51.050	4	163	245	249	53	85
New-11	44	0.00084	1.42	54.000	4	161	245	249	53	85
New-12	48	0.00084	1.42	57.171	4	153	245	248	55	85
New-13	52	0.00084	1.42	60.100	4	147	250	248	62	85
New-14	56	0.00084	1.42	62.900	4	158	244	250	57	85
New-15	60	0.00084	1.42	66.500	4	177	248	249	55	86
New-16	64	0.00084	1.42	68.918	4	156	247	248	59	86
New-17	68	0.00084	1.42	71.200	4	158	256	251	54	86
New-18	72	0.00084	1.42	74.800	4	190	254	250	55	86
New-19	76	0.00084	1.42	77.550	4	199	251	250	54	86
New-20	80	0.00084	1.42	80.211	4	205	251	250	54	86
New-21	84	0.00084	1.42	83.500	4	215	252	251	58	87
New-22	88	0.00084	1.42	86.300	4	218	251	250	54	87
New-23	92	0.00084	1.42	89.400	4	224	251	250	55	87
New-24	96	0.00084	1.42	92.200	4	221	250	253	58	88
New-25	100	0.00084	1.42	95.200	4	194	249	251	58	88
New-26	104	0.00084	1.42	98.100	4	201	248	251	54	88
New-27	108	0.00084	1.42	101.000	4	199	248	251	54	88
New-28	112	0.00084	1.42	103.945	4	199	247	252	58	88
Ave./Total	112	0.00084	1.42	81.938	4	188	250	250	56	85

Calculated Data and Test Results :

Sample Gas Volume =	75.316	DSCF
Water Vapor =	2.216	SCF
Moisture Content =	2.86	%
Average Stack Velocity =	1.8	ft/sec
Stack Flow =	540105	WACFM
	429186	WSCFM
	416918	DSCFM

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

% Isokinetic = 98.5 %

Client :	NSS	Unit:	New Baghouse	Location:	Outlet
Test # :	3	Date :	4-Oct-05	Job # :	902,264
Cp =	0.84	Noz Diam =	1.215 in.	Pbar =	29.17
Dry MW =	29.0	Ps =	0.30 in. H2O	Yd =	0.97
Stack Area=	4914.76 sq. ft.	Condensate =	53.8 g	Ref Tmp =	68
Avg. O2 =	19.7 %	Avg. CO2 =	1.2 %		

Data	Time	Del P	Del H	Meter	Vacuum	Temperatures (_F)				
Point	(min)	(in. H2O)	(in. H2O)	(ACF)	(in. Hg)	Stack	Probe	Filter	Dryer	Meter In
New-0	0			4.131						
New-1	4	0.0009	1.53	7.300	4	179	251	252	56	85
New-2	8	0.0009	1.53	10.150	4	205	252	253	52	85
New-3	12	0.0009	1.53	13.200	4	210	256	251	53	85
New-4	16	0.0009	1.53	16.243	4	209	253	247	53	85
New-5	20	0.0009	1.53	19.400	4	173	250	249	58	85
New-6	24	0.0009	1.53	22.400	4	206	251	248	57	85
New-7	28	0.0009	1.53	25.300	4	206	252	247	56	85
New-8	32	0.0009	1.53	28.410	4	207	251	248	52	85
New-9	36	0.0009	1.53	31.450	4	206	248	243	59	84
New-10	40	0.0009	1.53	34.500	4	200	247	249	56	84
New-11	44	0.0009	1.53	37.600	4	191	246	249	54	84
New-12	48	0.0009	1.53	41.001	4	203	247	250	56	84
New-13	52	0.0009	1.53	43.700	4	211	251	252	60	84
New-14	56	0.0009	1.53	47.100	4	212	250	251	52	84
New-15	60	0.0009	1.53	49.800	4	220	248	251	53	84
New-16	64	0.0009	1.53	52.883	4	225	247	250	54	84
New-17	68	0.0009	1.53	55.610	4	187	247	251	52	81
New-18	72	0.0009	1.53	59.100	4	196	248	251	56	81
New-19	76	0.0009	1.53	62.100	4	199	249	251	55	81
New-20	80	0.0009	1.53	65.100	4	208	248	246	52	81
New-21	84	0.0009	1.53	68.200	5	186	249	249	59	81
New-22	88	0.0009	1.53	71.200	5	183	248	250	51	81
New-23	92	0.0009	1.53	74.400	5	183	245	249	53	81
New-24	96	0.0009	1.53	77.300	5	195	248	249	54	81
New-25	100	0.0009	1.53	80.350	4	196	249	248	53	81
New-26	104	0.0009	1.53	83.400	4	204	250	249	54	81
New-27	108	0.0009	1.53	86.400	5	210	251	250	56	81
New-28	112	0.0009	1.53	89.495	5	201	250	251	55	81
Ave./Total	112	0.00090	1.53	85.364	4	200	249	249	55	83

Calculated Data and Test Results :

Sample Gas Volume =	78.536	DSCF
Water Vapor =	2.532	SCF
Moisture Content =	3.12	%
Average Stack Velocity =	1.9	ft/sec
Stack Flow =	564616	WACFM
	439505	WSCFM
	425779	DSCFM

Concentration of Species in Sampled Gas :

Mass Flow Rate of Species :

% Isokinetic = 100.5 %

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS	**Date**	10-4-05
Facility	St. Paul	**Job Number**	902264
Unit	New Baghouse	**Operator**	MC, JB
Location	Inlet Duct	**Test No.**	1
Bar. Pressure (inHg)	29.17	**Fuel Type**	None
Stack Pressure (inH20)	-11	**Stack % O2**	19.8
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	1.1
Flue Gas Moisure (%)	1.9	**Area (ft2)**	103.866
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

Traverse Point Port	Depth	Time	Delta P (in.H2O)	Ts (_F)	Velocity (ft/sec)	Cyclonic (Deg.)	Flow (DSCFM)	SqRoot Delta P
H	1		1.80	144	83.26	0	421760	1.342
H	2		1.80	148	83.53	0	420371	1.342
H	3		2.10	172	91.99	0	445348	1.449
H	4		2.50	175	100.60	0	484765	1.581
H	5		2.30	173	96.34	0	465704	1.517
H	6		2.20	182	94.89	0	452264	1.483
H	7		2.30	182	97.03	0	462428	1.517
H	8		2.10	189	93.22	0	439476	1.449
V	1		2.30	144	94.11	0	476753	1.517
V	2		2.20	166	93.70	0	458007	1.483
V	3		2.50	173	100.45	0	485530	1.581
V	4		2.50	174	100.52	0	485147	1.581
V	5		2.40	178	98.80	0	473853	1.549
V	6		2.30	180	96.87	0	463150	1.517
V	7		2.30	174	96.42	0	465337	1.517
V	8		1.80	191	86.43	0	406250	1.342
Averages			2.21	172	94.26	0	456634	1.485

Abs. Stack Pres.	28.36	**in.Hg Absolute**
Stack Velocity	94.25	**feet/second**
	5655	**feet/minute**
Stack Volumetric Flow	587369	**WACFM**
	465470	**WSCFM**
	456626	**DSCFM**
	9789	**WACFS**

Area (ft2)	ft/sec	Delta P	Proof
4914.762	2.018	0.00103	2.018

Baghouse	H20 Pres Stack	Stk Temp _F
	0.3	180
	29.189118	640

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS	**Date**	10-4-05
Facility	St. Paul	**Job Number**	902264
Unit	New Baghouse	**Operator**	MC, JB
Location	Inlet Duct	**Test No.**	2
Bar. Pressure (inHg)	29.17	**Fuel Type**	None
Stack Pressure (inH20)	-11	**Stack % O2**	19.8
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	1.1
Flue Gas Moisure (%)	1.9	**Area (ft2)**	103.866
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

raverse Point Port	**Depth**	**Time**	**Delta P (in.H2O)**	**Ts (_F)**	**Velocity (ft/sec)**	**Cyclonic (Deg.)**	**Flow (DSCFM)**	**SqRoot Delta P**
v	1	10:28 AM	1.90	223	90.96	0	407488	1.378
v	2		2.10	243	97.02	0	422260	1.449
v	3		2.00	249	95.08	0	410336	1.414
v	4		2.20	260	100.49	0	427064	1.483
v	5		2.00	263	96.02	0	406344	1.414
v	6		1.90	264	93.65	0	395781	1.378
v	7		1.90	262	93.52	0	396329	1.378
v	8		1.70	261	88.40	0	375150	1.304
h	1		2.00	187	90.83	0	429547	1.414
h	2		2.10	197	93.79	0	436792	1.449
h	3		2.20	210	96.94	0	442713	1.483
h	4		2.20	222	97.81	0	438801	1.483
h	5		2.00	214	92.70	0	420856	1.414
h	6		2.10	216	95.14	0	430610	1.449
h	7		1.80	217	88.14	0	398373	1.342
h	8	10:37 AM	1.70	216	85.60	0	387435	1.304
Averages			1.99	232	93.50	0	414117	1.409

Abs. Stack Pres.	28.36	**in.Hg Absolute**
Stack Velocity	93.53	**feet/second**
	5612	**feet/minute**
Stack Volumetric Flow	582886	**WACFM**
	421879	**WSCFM**
	413864	**DSCFM**
	9715	**WACFS**

Area (ft2)	**ft/sec**	**Delta P**	**Proof**
4914.762	1.829	0.00084	1.829
Baghouse	**H20 Pres Stack**	**Stk Temp _F**	
	0.3	180	
	29.189118	640	

EPA REFERENCE METHOD 2

Determination of Stack Gas Velocity & Volumetric Flow Rate

Client	NSS	**Date**	10-4-05
Facility	St. Paul	**Job Number**	902264
Unit	New Baghouse	**Operator**	MC, JB
Location	Inlet Duct	**Test No.**	3
Bar. Pressure (inHg)	29.17	**Fuel Type**	None
Stack Pressure (inH20)	-11	**Stack % O2**	19.8
Pitot Tube Coef. (Cp)	0.84	**Stack % CO2**	1.1
Flue Gas Moisure (%)	1.9	**Area (ft2)**	103.866
Stack MW Dry	28.85	**Stack MW Wet**	28.52
Ref Pres (in.Hg)	29.92	**Ref Temp _F**	68

Traverse Point Port	**Depth**	**Time**	**Delta P (in.H2O)**	**Ts (_F)**	**Velocity (ft/sec)**	**Cyclonic (Deg.)**	**Flow (DSCFM)**	**SqRoot Delta P**
v	1	3:34 PM	2.10	173	92.06	0	444996	1.449
v	2		1.90	181	88.12	0	420626	1.378
v	3		2.20	187	95.26	0	450513	1.483
v	4		2.10	183	92.78	0	441522	1.449
v	5		2.00	176	90.05	0	433246	1.414
v	6		1.80	171	85.10	0	412638	1.342
v	7		1.80	169	84.96	0	413294	1.342
v	8		1.60	177	80.61	0	387203	1.265
h	1		1.90	145	85.61	0	432959	1.378
h	2		2.00	155	88.55	0	440581	1.414
h	3		2.20	157	93.03	0	461335	1.483
h	4		2.10	156	90.82	0	451094	1.449
h	5		1.60	154	79.14	0	394388	1.265
h	6		1.90	157	86.45	0	428728	1.378
h	7		2.10	162	91.26	0	448913	1.449
h	8	3:42 PM	1.40	160	74.39	0	367127	1.183
Averages			1.92	166	87.39	0	426823	1.383

Abs. Stack Pres.	28.36	**in.Hg Absolute**
Stack Velocity	87.38	**feet/second**
	5243	**feet/minute**
Stack Volumetric Flow	544559	**WACFM**
	435075	**WSCFM**
	426808	**DSCFM**
	9076	**WACFS**

Area (ft2)	**ft/sec**	**Delta P**	**Proof**
4914.762	1.887	0.00090	1.887

Baghouse	**H20 Pres Stack**	**Stk Temp _F**
	0.3	180
	29.189118	640

METHOD 9 REDUCED FIELD DATA

Client:	Gerdau Ameristeel	Date:	10-4-05
Facility:	St. Paul	Time:	11:40-12:40
Unit:	New Baghouse	Project #:	902264
Location:	Baghouse vents	Comments:	

Test Results:

Maximum 6 Minute Average:	0.0	%
Average Opacity:	0.0	%
Maximum Opacity:	0.0	%
Minimum Opacity:	0.0	%
# of Readings >20%:	0	
Number of Readings:	240	

Interval	0	15	30	45
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Interval	0	15	30	45
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0

Appendix C

Process Operations Data

Minnesota Pollution Control Agency

Operating Data Summary For Process Sources

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651)-296-6300

Form ST-05
12/01/04

Test Date(s): 10-4-05 **Process Equipment Number/Identification:** EP-002
Company Name: Gerdau Ameristeel

Equipment & Operating Data

1. Process Equipment Description: Electric Arc Furnace
2. Were the process and control equipment operated consistent with normal procedures? YES☒ NO☐ If no, explain:
3. Include copy of production records or instrumentation which indicates rate of production or operation of the equipment, i.e. units per hour, pounds per hour, pressure, air flow, etc.
4. Date(s) and procedure(s) of last maintenance/cleaning within 6 months: ☐ Remains unchanged from info. provided in test plan Routine Maintenance
5. Process rate (amount of raw material or finished product per hour, wet or dry basis) while combusting (list fuel type(s) and ratios as appropriate)

Process Parameter: list type and units	Run 1	Run 2	Run 3
Steel (Tons/hr)	98.0	100.6	92.3
Fuel Input (list units)	NA	NA	NA
Heat Input (10^6 British thermal units/hour)	NA	NA	NA

6. Summarize control equipment operating data documented during testing. Values reported should reflect maximum, minimum, averages, or as approved in the test plan. (See test plan and approval letter)

Examples of APC equipment and parameters generally monitored. Monitor as in test plan and/or approval letter.

- **Scrubber** (list type of scrubber): ΔP (in. w.c.) and feed rate (gpm and psig)
- **Baghouse, Cyclone, and Multi-clone:** ΔP (in. w.c.)
- **Catalytic Incinerator** :($°F_{in}$,$°F_{out}$) and Thermal Incinerator: ($°F_{temperature}$)
- **ESP:** Number and identity of operating field(s)

APC and parameter monitored	Run 1	Run 2	Run 3
Delt P Average Throughout Baghouse	5.46	4.53	4.24
List pollutant & averaging basis.--should reflect permit	Run 1	Run 1	Run 1
Continuous Opacity Monitor(list hourly average)			
_____Monitor (list averaging basis):			
_____Monitor (list averaging basis:			

Abbreviations: APC-air pollution control; lbs.-pounds; gpm.-gallons per minute; psig-pressure per square inch gauge; in. w.c.-inches of water column; ΔP- pressure drop

Note: This form provides only a summary of the operating conditions during the performance test. Additional and more detailed records are required to meet the requirements of Minn. R. 7017.2035, subp. 3. This form is to be submitted as part of the performance test report.

Douglas Stolowski
Environmental Manager
1678 Red Rock Road
St. Paul, MN 55119
p. 651.731.5697
f. 651.731.5699
m. 214.334.5498

-----Original Message-----
From: Brian Durkop [mailto:bwdurkop@tds.net]
Sent: Sunday, November 13, 2005 10:02 PM
To: Stolowski, Douglas
Subject: RE: meltshop heat #'s

Doug,

I am trying to get this report finalized but cannot understand the process data you sent.

Maybe you could calculate what I need for each run.

Thanks

10-4-05

New Baghouse		Run 1	Run 2	Run 3
		1013-1248	1509-1722	1744-2004
Steel tons/hr	6:03 a.m.			
# of Heats		98	100.6	92.3
Amps Fan 1	0	0	0	0
Amps Fan 2	170	163	183	160
Amps Fan 3	171	163	181	158
			12:56 (Time)	
Delta P #1	8.11	6.25	5.61	
Delta P #2	3.62	3.6	3.61	
Delta P #3	5.24	4.74	4.62	
Delta P #4	cleaning	3.7	4.06	
Delta P #5	5.65	4.96	4.3	
Delta P #6	5.99	5.1	4.44	
Delta P #7	4.14	3.37	3.05	
Avg.	5.46	4.53	4.24	

Please provide information about any maintanence done to the Amerex Baghouse in the last 6 months for the report

10-4-05

Old Baghouse	Run 1	Run 2	Run 3
	957-1206	1245-1553	1615-1910
Steel tons/hr			
# of Heats	98	95.7	100.6

Time	6:03 a.m.	Time 6:59 a.m.	12:55 p.m.
Amps Fan 1	110	110	109
Amps Fan 2	110	110	104
Delta P #1	4.50	3.93	3.71
Delta P #2	4.00	3.42	3.21
Delta P #3	4.00	3.94	3.78
Delta P #4	4.00	3.18	2.92
Delta P #5	4.00	4.08	4.02
Delta P #6	4.00	3.78	3.56
Delta P #7	4.00	3.82	3.71
Delta P #8	4.00	3.40	3.2

Delta P #9	3.50	3.80	3.67
Delta P #10	4.00	3.30	3.05
Delta P #11	4.00	3.93	3.59
Delta P #12	4.00	3.65	3.21
Avg.	4.00	3.69	3.47

Please provide information about any maintanence done to the Amerex Baghouse in the last 6 months for the report

-----Original Message-----
From: Stolowski, Douglas [mailto:DStolowski@GerdauAmeriSteel.com]
Sent: Tuesday, November 01, 2005 4:39 PM
To: Brian Durkop
Subject: meltshop heat #'s

Brian-
Attached are the meltshop heat #'s.

Please let me know if you have any questions.

Douglas Stolowski
Environmental Manager
1678 Red Rock Road
St. Paul, MN 55119
p. 651.731.5697
f. 651.731.5699
m. 214.334.5498

Appendix D

Laboratory Test Analyses

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Total Emissions

Client	**North Star Steel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902264**
Unit	**New Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***10:13-12:48***		***Date***	***10/4/2005***
Filterable Net Gain		**2.7**	**mg**	**19.80**	**% Oxygen**
Condensable Net Gain		**5.0**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**83.116**	**dscf**		
Stack Volumetric Flow		**463947**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.093**	**mg/dscf**
Particulate Emission Rate				**5.685**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**0.018**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**7.70**	**mg**

TEST 2	***Time***	***15:09-17:22***		***Date***	***10/4/2005***
Filterable Net Gain		**5.4**	**mg**	**19.80**	**% Oxygen**
Condensable Net Gain		**8.4**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**75.316**	**dscf**		
Stack Volumetric Flow		**416918**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.183**	**mg/dscf**
Particulate Emission Rate				**10.103**	**lbs/hr**
Particulate Concentration				**0.003**	**gr/dscf**
Particulate Concentration				**0.036**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**13.80**	**mg**

TEST 3	***Time***	***17:44-20:04***		***Date***	***10/4/2005***
Filterable Net Gain		**0.0**	**mg**	**19.70**	**% Oxygen**
Condensable Net Gain		**2.3**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**78.536**	**dscf**		
Stack Volumetric Flow		**425779**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.029**	**mg/dscf**
Particulate Emission Rate				**1.649**	**lbs/hr**
Particulate Concentration				**0.000**	**gr/dscf**
Particulate Concentration				**0.005**	**gr/dscf @7% Oxygen**
Total Particulate Gain (mg)				**2.30**	**mg**

RESULT AVERAGE TEST 1-3			
Particulate Concentration	**NA**	**lbs/mmBtu**	
Particulate Concentration	**0.102**	**mg/dscf**	
Particulate Emission Rate	**5.812**	**lbs/hr**	
Particulate Concentration	**0.002**	**gr/dscf**	
Particulate Concentration	**0.020**	**gr/dscf @7% Oxygen**	

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Filterable Emissions

Client	**North Star Steel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902264**
Unit	**New Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***10:13-12:48***		***Date***	***10/4/2005***
Filter Net Gain		**0.0**	**mg**	**19.80**	**% Oxygen**
Probe Rinse Net Gain		**2.7**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**83.116**	**dscf**		
Stack Volumetric Flow		**463947**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.032**	**mg/dscf**
Particulate Emission Rate				**1.993**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**0.006**	**gr/dscf @7% Oxygen**

TEST 2	***Time***	***15:09-17:22***		***Date***	***10/4/2005***
Filter Net Gain		**0.0**	**mg**	**19.80**	**% Oxygen**
Probe Rinse Net Gain		**5.4**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**75.316**	**dscf**		
Stack Volumetric Flow		**416918**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.072**	**mg/dscf**
Particulate Emission Rate				**3.953**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**0.014**	**gr/dscf @7% Oxygen**

TEST 3	***Time***	***17:44-20:04***		***Date***	***10/4/2005***
Filter Net Gain		**0.0**	**mg**	**19.70**	**% Oxygen**
Probe Rinse Net Gain		**0.0**	**mg**	**NA**	**F-factor**
Sample Gas Volume		**78.536**	**dscf**		
Stack Volumetric Flow		**425779**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.000**	**mg/dscf**
Particulate Emission Rate				**0.000**	**lbs/hr**
Particulate Concentration				**0.000**	**gr/dscf**
Particulate Concentration				**0.000**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3

Particulate Concentration	**NA**	**lbs/mmBtu**
Particulate Concentration	**0.035**	**mg/dscf**
Particulate Emission Rate	**1.982**	**lbs/hr**
Particulate Concentration	**0.001**	**gr/dscf**
Particulate Concentration	**0.007**	**gr/dscf @7% Oxygen**

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Aqueous Condensable Emissions

Client	**North Star Steel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902264**
Unit	**New Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***10:13-12:48***		***Date***	***10/4/2005***
Dried Sample Net Gain		**5.0**	**mg**	**19.80**	**% Oxygen**
Aqueous Net Gain (H20)		**5.0**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**83.116**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**463947**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.060**	**mg/dscf**
Particulate Emission Rate				**3.691**	**lbs/hr**
Particulate Concentration				**0.001**	**gr/dscf**
Particulate Concentration				**0.012**	**gr/dscf @7% Oxygen**
TEST 2	***Time***	***15:09-17:22***		***Date***	***10/4/2005***
Dried Sample Net Gain		**8.4**	**mg**	**19.80**	**% Oxygen**
Aqueous Net Gain (H20)		**8.4**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**75.316**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**416918**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.112**	**mg/dscf**
Particulate Emission Rate				**6.150**	**lbs/hr**
Particulate Concentration				**0.002**	**gr/dscf**
Particulate Concentration				**0.022**	**gr/dscf @7% Oxygen**
TEST 3	***Time***	***17:44-20:04***		***Date***	***10/4/2005***
Dried Sample Net Gain		**2.3**	**mg**	**19.70**	**% Oxygen**
Aqueous Net Gain (H20)		**2.3**	**mg**	**NA**	**Sulfates (mg/ml)**
Sample Gas Volume		**78.536**	**dscf**	**NA**	**Impinger Volume (ml)**
Stack Volumetric Flow		**425779**	**dscfm**	**NA**	**Sulfate Aliquot Vol (ml)**
				NA	**F-factor**
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.029**	**mg/dscf**
Particulate Emission Rate				**1.649**	**lbs/hr**
Particulate Concentration				**0.000**	**gr/dscf**
Particulate Concentration				**0.005**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3			
Particulate Concentration	**NA**	**lbs/mmBtu**	
Particulate Concentration	**0.067**	**mg/dscf**	
Particulate Emission Rate	**3.830**	**lbs/hr**	
Particulate Concentration	**0.001**	**gr/dscf**	
Particulate Concentration	**0.013**	**gr/dscf @7% Oxygen**	

EPA REFERENCE METHOD 5

Determination of Particulate Emissions from Stationary Sources

Organic Condensable Emissions

Client	**North Star Steel**	**Analyst**	**MAC**
Facility	**St. Paul**	**Job Number**	**902264**
Unit	**New Baghouse**	**Description**	**Particulates**
Location	**Stack**		

TEST 1	***Time***	***10:13-12:48***		***Date***	***10/4/2005***
Organic Net Gain (Solvent)		**0.0**	**mg**	**19.80**	**% Oxygen**
Sample Gas Volume		**83.116**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**463947**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0000**	**mg/dscf**
Particulate Emission Rate				**0.0000**	**lbs/hr**
Particulate Concentration				**0.00000**	**gr/dscf**
Particulate Concentration				**0.00000**	**gr/dscf @7% Oxygen**

TEST 2	***Time***	***15:09-17:22***		***Date***	***10/4/2005***
Organic Net Gain (Solvent)		**0.0**	**mg**	**19.80**	**% Oxygen**
Sample Gas Volume		**75.316**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**416918**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0000**	**mg/dscf**
Particulate Emission Rate				**0.0000**	**lbs/hr**
Particulate Concentration				**0.00000**	**gr/dscf**
Particulate Concentration				**0.00000**	**gr/dscf @7% Oxygen**

TEST 3	***Time***	***17:44-20:04***		***Date***	***10/4/2005***
Organic Net Gain (Solvent)		**0.0**	**mg**	**19.70**	**% Oxygen**
Sample Gas Volume		**78.536**	**dscf**	**NA**	**F-factor**
Stack Volumetric Flow		**425779**	**dscfm**		
Particulate Concentration				**NA**	**lbs/mmBtu**
Particulate Concentration				**0.0000**	**mg/dscf**
Particulate Emission Rate				**0.0000**	**lbs/hr**
Particulate Concentration				**0.00000**	**gr/dscf**
Particulate Concentration				**0.00000**	**gr/dscf @7% Oxygen**

RESULT AVERAGE TEST 1-3

Particulate Concentration	**NA**	**lbs/mmBtu**
Particulate Concentration	**0.0000**	**mg/dscf**
Particulate Emission Rate	**0.0000**	**lbs/hr**
Particulate Concentration	**0.00000**	**gr/dscf**
Particulate Concentration	**0.00000**	**gr/dscf @7% Oxygen**

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: NA
Filter/Container Type:
Filter/Container No.: Dun 18
Sample Description: Test 1 Filter

								Average
Initial Weight (g)	Date	8-29-05	8-29-05					0.3121
	Time	1130	1403					
	Weight	0.3121	0.3121					
Final Weight (g)	Date	10-7-05	10-7-05					0.3112
	Time	1015	1432					
	Weight	0.3112	0.3112					

Weight Gain (mg): -0.9
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 0.0

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: NA
Filter/Container Type: —
Filter/Container No.: Dun 15
Sample Description: Test 2 Filter

								Average
Initial Weight (g)	Date	8-29-05	8-29-05					0.3114
	Time	1124	1407					
	Weight	0.3114	0.3115					
Final Weight (g)	Date	10-7-05	10-7-05					0.3086
	Time	1014	1431					
	Weight	0.3088	0.3083					

Weight Gain (mg): -2.8
Blank Correction: ____
Aliquot Correction: ____
Particulate Weight (mg): 0.0

Analyst : ____
Approved by : ____
Method : ____
Date : ____

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: NA
Filter/Container Type: —
Filter/Container No.: I13
Sample Description: Test 3 Filter

								Average
Initial Weight (g)	Date	6-3-05	6-3-05					0.3132
	Time	1015	1456					
	Weight	0.3132	0.3131					
Final Weight (g)	Date	10-7-05	10-7-05					0.3120
	Time	1016	1433					
	Weight	0.3122	0.3118					

Weight Gain (mg): -1.2
Blank Correction: ____
Aliquot Correction: ____
Particulate Weight (mg): 0.0

Analyst: ____
Approved by: ____
Method: ____
Date: ____

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 170
Filter/Container Type: 250
Filter/Container No.: 88
Sample Description: Test 1 Acetone

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	906	1308					118.1205
	Weight	118.1206	118.1204					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1213	1621					118.1232
	Weight	118.1234	118.1231					

Weight Gain (mg): 2.7
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 2.7

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 80
Filter/Container Type: 150
Filter/Container No.: 920045
Sample Description: Test 2 Acetone

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					68.8942
	Time	916	1316					
	Weight	68.8944	68.8940					
Final Weight (g)	Date	10-7-05	10-7-05					68.8996
	Time	1159	1621					
	Weight	68.8998	68.8993					

Weight Gain (mg): 5.4
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 5.4

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 140
Filter/Container Type: 250
Filter/Container No.: 84
Sample Description: Test 3 Acetone

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	917	1318					105.8162
	Weight	105.8164	105.8159					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1215	1622					105.8160
	Weight	105.8159	105.8161					

Weight Gain (mg): -0.2
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 0.0

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 200
Filter/Container Type: 250
Filter/Container No.: 8
Sample Description: Test 1 MeCl2

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	1009	1340					87.2977
	Weight	87.2979	87.2975					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1209	1623					87.2965
	Weight	87.2967	87.2963					

Weight Gain (mg): -1.2
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 0.0

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse
Sample Volume: 200
Filter/Container Type: 250
Filter/Container No.: 11
Sample Description: Test 2 $MeCl_2$

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	1056	1353					85.8502
	Weight	85.8503	85.8500					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1208	1624					85.8495
	Weight	85.8495	85.8495					

Weight Gain (mg): -0.7
Blank Correction: _____
Aliquot Correction: _____
Particulate Weight (mg): 0.0

Analyst: _____
Approved by: _____
Method: _____
Date: _____

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 200
Filter/Container Type: 250
Filter/Container No.: E10
Sample Description: Test 3 MeCl2

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	1013	1347					114.1374
	Weight	114.1377	114.1372					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1207	1626					114.1366
	Weight	114.1363	114.1368					

68

Weight Gain (mg): -0.8
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 0.0

Analyst :
Approved by :
Method :
Date :

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 250 + 50
Filter/Container Type: 250
Filter/Container No.: 23
Sample Description: Test 1 H_2O

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	1021	1342					87.8820
	Weight	87.8822	87.8818					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1201	1630					87.8870
	Weight	87.8871	87.8868					

Weight Gain (mg): 5.0
Blank Correction: _____
Aliquot Correction: _____
Particulate Weight (mg): 5.0

Analyst: _____
Approved by: _____
Method: _____
Date: _____

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 250 + 100
Filter/Container Type: 250
Filter/Container No.: 20
Sample Description: Test 2 H_2O

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					86.7396
	Time	1034	1348					
	Weight	86.7398	86.7394					
Final Weight (g)	Date	10-7-05	10-7-05					86.7480
	Time	1205	1637					
	Weight	86.7478	86.7481					

Weight Gain (mg): 8.4
Blank Correction: _____
Aliquot Correction: _____
Particulate Weight (mg): 8.4

Analyst: _____
Approved by: _____
Method: _____
Date: _____

Eagle Mountain Scientific Inc.

PARTICULATE WEIGHT ANALYSIS

Company: Gerdau Ameristeel
Project #: 902264
Sample #: New Baghouse

Sample Volume: 250 ± 20
Filter/Container Type: 25G
Filter/Container No.: E8
Sample Description: Test 3 H_2O

								Average
Initial Weight (g)	Date	10-3-05	10-5-05					
	Time	1021	1401					108.6074
	Weight	108.6076	108.6071					
Final Weight (g)	Date	10-7-05	10-7-05					
	Time	1206	1637					108.6097
	Weight	108.6096	108.6098					

Weight Gain (mg): 2.3
Blank Correction:
Aliquot Correction:
Particulate Weight (mg): 2.3

Analyst :
Approved by :
Method :
Date :

Appendix E

Equipment Calibrations

EMSI
Dry Gas Meter Calibrations

Dry Gas Meter #:	2010-5	Reference Std.:	Gold Standard
Pump #:	2010-5	Ref. Correction:	1.000
Bp:	29.03	Standard Temp.:	68
Date:	8/25/2005	Standard Pres.:	29.92

Reference Std. Data								Field Dry Gas Meter							
				Meter Temperatures								Meter Temperatures			
Final Volume	Initial Volume	Total Volume	Initial Inlet	Initial Outlet	Final Inlet	Final Outlet	Delta H	Final Volume	Initial Volume	Total Volume	Initial Inlet	Initial Outlet	Final Inlet	Final Outlet	Run Times
495.010	486.251	8.759	68	68	69	68	1.00	14.184	5.075	9.109	70	70	71	70	15
503.777	495.010	8.767	69	69	70	69	1.00	23.322	14.184	9.138	72	70	73	71	15
510.952	503.777	7.175	70	69	70	70	1.50	30.765	23.322	7.443	73	71	75	72	10
518.118	510.952	7.166	71	70	71	70	1.50	38.207	30.765	7.442	76	72	76	73	10
526.478	518.118	8.360	71	70	71	70	2.00	46.865	38.207	8.658	75	73	76	73	10
535.089	526.478	8.611	71	70	71	70	2.00	55.774	46.865	8.909	75	74	76	74	10.3
544.414	535.089	9.325	71	70	72	70	2.50	65.394	55.774	9.620	76	74	77	74	10
553.718	544.414	9.304	72	70	72	70	2.50	74.902	65.394	9.508	76	75	77	75	10

EMSI
Dry Gas Meter Calibrations

Dry Gas Meter #:	2010-5	Reference Std.:	Gold Standard
Pump #:	2010-5	Ref. Correction:	1.0047
Bp:	29.03	Standard Temp.:	68
Date:	8/25/2005	Standard Pres.:	29.92

Delta H	Run Times	Yd	Error +/-0.02	Delta H@	Error +/-0.20
1.00	15.00	0.963	0.01	1.61	-0.01
1.00	15.00	0.961	0.01	1.61	-0.01
1.50	10.00	0.966	0.00	1.60	0.00
1.50	10.00	0.966	0.00	1.61	-0.01
2.00	10.00	0.968	0.00	1.57	0.01
2.00	10.30	0.970	0.00	1.57	0.01
2.50	10.00	0.972	0.00	1.58	0.01
2.50	10.00	0.981	-0.01	1.59	0.00
Average		0.968	0.00	1.592	0.00

Whitlow Enterprises, LLC

www.smokeschool.net

Certifies that

Mark Carlson of Eagle Mountain Scientific Inc.

Has met all of the requirements of EPA Reference Method 9 and 22
And is qualified as a Visible Emissions Observer
Date: March 25, 2005
This certificate is valid for 6 months after the above date

George Artie "Butch" Whitlow

Certificate Number 923

Appendix F

Test Plan and Approval Letter

Performance Test Plan Approval

Minnesota Pollution Control Agency
520 Lafayette Rd. N. Saint Paul, MN 55155-4194 (651) 296-6300
www.pca.state.mn.us

AQ#151

Facility Name: Gerdau Ameristeel St. Paul Mill
Facility Contact: Douglas Stolowski
Address: 1678 Red Rock Road
St. Paul, Minnesota 55119
Phone: (651) 731-5697
Emission Unit(s): Ladle Refining Station (EU001) and Electric Arc Furnace (EU002)
Scheduled For: October 4, 2005, at your Facility located in St. Paul, Minnesota.

Your test plan submitted on August 29, 2005, and discussed on September 27, 2005, has been approved by the Minnesota Pollution Control Agency (MPCA) as follows:

☐ Shortened test notification approved

☒ Test plan approved without modification

☐ Test plan approved with the following provisions:

Particulate matter and PM_{10} emissions measured by Method 5D and opacity determined using Method 9.

Include in the final test report(s) all process and pollution control equipment operating data collected at 15 minute intervals and averaged for each test period. This information should be easily understood by individuals not familiar with the process.

Include in the final test report and CD-ROM copy; a signed certifications form, the test plan, this test plan approval letter (TPAL) and the email to which the TPAL was attached.

Include in the final test report a simplified drawing of the test locations including pollution control equipment, stack orientation and test port locations.

Obtain the required submittal and operating data forms from the website noted below.

Attached Forms:

☐ Operating Data Summary- Combustion Sources
☐ Operating Data Summary- Process Sources
☐ Certifications Form
☐ Operating Data Summary- Waste Combustors
☐ Operating Data Summary- Asphalt Plants
☐ Microfiche/CD-ROM Submittal Form

Note: Forms are also available at: www.pca.state.mn.us/air/performancetest.html

Approved by: **Date: 9/27/05**

Curtis Stock
Performance Test Coordinator
Compliance and Enforcement Section
Industrial Division

Mark Carlson

From: Brian Durkop [bdurkop@eagle-msi.com]
Sent: Friday, October 14, 2005 8:11 AM
To: Mark Carlson
Subject: FW: TPAL for Gerdau Ameristeel

TPAL for Gerdau Ameristeel Oct...

-----Original Message-----
From: Stock, Curtis [mailto:Curtis.Stock@state.mn.us]
Sent: Tuesday, September 27, 2005 4:13 PM
To: bdurkop@eagle-msi.com
Cc: Berg, Robert C.
Subject: TPAL for Gerdau Ameristeel

Brian,

Attached is the test plan approval letter (TPAL) for the PM/PM10 testing to be performed at the Gerdau Ameristeel facility located in St. Paul, Minnesota.

Please include a copy of the test plan, TPAL and this email in the final test report.

Please forward a copy to Douglas Stolowski at Gerdau Ameristeel.

Contact me if you have any questions.

Curt Stock
Performance Test Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194

(651) 297-8480
(651) 296-8717 (fax)

Please contact me at (651) 297-8480 if you have any questions regarding this approval.

Please be aware that enforcement action will be taken for performance test failures indicating emissions above applicable limits (excess actual emissions to the environment). Failures commonly result in assessment of a monetary penalty. Upon the first test failure, the Company should take immediate measures to minimize emissions. The measures taken should be documented, as they will become part of the record of corrective actions.

Hard Copy Performance Test Reports and Microfiche or CD Copy submittals will be addressed to: Compliance Tracking Coordinator, Compliance and Enforcement Unit, Industrial Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194

cc: Douglas Stolowski, Gerdau Ameristeel (email)
Brian Durkop, Eagle Mountain(email)
Robert Berg, MPCA St. Paul (email)
AQ Correspondense File No. 151

TEST PLAN FOR MISCELLANEOUS SOURCES

Proposed test date(s): *October 3-4, 2005*
Date Test Plan Written: *August 22, 2005*

PART I. GENERAL INFORMATION

1. Name and street address of emission facility:
   Gerdau Ameristeel
   1678 Red Rock Road
   St. Paul, Minnesota 55119

   Name, Title, Telephone and Facsimile number of contact person at emission facility:
   Mr. Douglas Stolowski
   Regional Environmental Affairs Manager
   Phone: (612) 731-5697
   Fax: (612) 731-5699

2. Permit File Number: *#12300055-11*

3. Reason the emission unit(s) is (are) to be tested: *To demonstrate compliance with emission limitations set forth in the MPCA Permit #12300055-11.*

4. Physical description and location layout of emission unit(s) to be tested: *See Below*

Emission Point #1
Old Baghouse (Inlet duct) - 16 Points
Volumetric Flow Rate

See Attachment 1

Old Baghouse (Baghouse) - 108 Points
36 points per test
Particulate Sampling

3x3 Matrix in each of 12 compartments

3x3	3x3	3x3	3x3	3x3	3x3
3x3	3x3	3x3	3x3	3x3	3x3

Emission Point #2
New Baghouse (Inlet Duct) - 16 Points
Volumetric Flow Rate

See Attachment 2

New Baghouse (Baghouse) - 84 Points
28 points per test
Particulate Sampling

4x3 Matrix in each of seven compartments

4x3	4x3	4x3	4x3	4x3	4x3	4x3

5. Name of Independent Testing Company, contact person, and telephone number:
   Eagle Mountain Scientific, Inc.
   Brian Durkop
   Phone: (763) 477-4462
   Fax: (763) 477-5991
   Email: bdurkop@eagle-msi.com

PART II. TESTING REQUIREMENTS

1. The following is a description of the Pollutant(s) to be tested, and the applicable emission limit(s), and the applicable rule(s) or regulation(s) for each emission limit:

Pt. #	Limitation Basis	Pollutant Tested/Limit	Specific Methods
1	* See Footnote 1	PM, 0.0052 gr/dscf	EPA Method 5D and 202
1	* See Footnote 1	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
1	40 CFR 60.272a	Opacity, 3%	EPA Method 9
2	40 CFR 60.272a	PM, 0.0052 gr/dscf	EPA Method 5D and 202
2	* See Footnote 2	PM10, 0.0052 gr/dscf	EPA Method 5D and 202
2	40 CFR 60.272a	Opacity, 3%	EPA Method 9

Footnote 1 – Limit emissions to those used for netting calculations.
Footnote 2 – Minnesota SIP modeled PM10 ambient air quality standard compliance.

Operating Data to be recorded during the Test:

1. Operating conditions of each source tested and its associated pollution control equipment will be documented in the test report. Documentation of operating conditions includes all parameters listed in Part III.

   Process conditions including baghouse pressure drops and fan amps will be recorded every 15 minutes during each test.

2. The following is a detailed description of the procedure for fuel sampling and analysis to be followed for the applicable emission unit. *NA*

PART III. OPERATING CONDITIONS

1. The following contains a detailed description of the emission unit(s) to be tested:

   Detailed descriptions of record keeping that include the specific time interval, and other parameters listed that will determine production, operating capacity, and/or operating conditions during testing are also included:

Emission Point No. 01: **Old Baghouse (Ladle Refining Station)**

Process Equipment Description for units to be tested:

Ladle Refining Station
Type: Ladle Refining Furnace
Mfr: Voest-Alpine Industries, Inc.
Capacity: 90 to 100 tons per heat
Continuous Casting Machine
Mfr: Mini-Castco
Capacity: 700,000 tons/year

Process Equipment Parameter Monitoring During Performance Test:

Tons per heat
Heat duration

Process Rates/Operating Conditions During Testing:

Batch process
Normal

Control Equipment Description:

Type: Fabric filter baghouse - positive pressure
Mfr: American Air Filter
Air Flow: 250,000 to 360,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Gas Temperature: 100 to 140 degrees F

Control Equipment Operating Parameter During Test: *(15 minute Intervals)*

Air Flow: 250,000 to 300,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Continuous Cleaning Cycle

Emission Point No. 02: **New Baghouse (Electric Arc Furnace)**

Process Equipment Description for units to be tested:

Type: Electric Arc Furnace
Mfr: Voest
Capacity: 90 to 100 ton heat size

Process Equipment Parameter Monitoring During Performance Test:

Tons per heat
Heat duration

Process Rates/Operating Conditions During Testing:

Batch process
Normal

Control Equipment Description:

Type: Fabric filter baghouse - positive pressure
Mfr: Amerex
Air Flow: 450,000 to 850,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Gas Temperature: 125 to 250 degrees F

Control Equipment Operating Parameter During Test: *(15 minute Intervals)*

Air Flow: 500,000 to 700,000 acfm
Pressure Drop: 2.5-8.0 inches of water per compartment
Continuous Cleaning Cycle

2. For each process unit listed in Part III, Item 1, the normal range of process or operating rates for each emission unit are listed below. The proposed test conditions listed in Part III, Item

1, are considered worst case in accordance with Minn. R. 7017.2025, subpart 2 as indicated below:

Emission Point No. 01: Old Baghouse (Ladle Refining Station)

Normal Range of Process or Operating Rates Rationale For Worst Case

Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat
Maximum production rate

Emission Point No. 02: New Baghouse (Electric Arc Furnace)

Normal Range of Process or Operating Rates Rationale For Worst Case

Batch Process – Heat duration is highly specific to the type of product in production. To achieve worst case scenario testing is conducted when process is in operation only by suspending testing during downtime.

90 to 100 tons per heat
Maximum production rate

PART IV. TEST METHODS

1. The following is a description of the methods, number of test runs, length of test runs, and sampling rate of each pollutant:

   A. EPA Method 1 for the location of sampling ports and points.
   B. EPA Method 2 for velocity and volumetric flow rate. One measurement just prior to each test run for TSP as PM10.
   C. EPA Method 3 for gas analysis. One test run on an integrated sample taken concurrently with each run for velocity and volumetric flow rate.
   D. EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for TSP as PM10.
   E. EPA Method 5D and 202 (TSP) for the concentration of particulate matter including organic condensable. Results are to be reported both as filterable particulate matter containing organic condensable (where the limit includes organic condensable), and as filterable particulate matter excluding organic condensable (where the limit does not include organic condensable). Run time: 120 minutes, Sample volume: 60 dscf (1.70 dscm) No. Runs: 3. TSP values will be reported as PM10 to meet the permits applicable emission standard.
   F. *EPA Method 9 as amended by Minn. R. 7017.2060 for visual determination of opacity. One-hour observation, concurrent with one test run for TSP as PM10.*

Justification for EPA 5D testing verses PM10 testing using EPA 201A

The emission points proposed to be tested are the old and new baghouses. These baghouses are of the single monovent positive pressure design. Flow determination at the sample location in

the baghouse compartments is not measurable using conventional testing equipment. In order to determine the flow in the baghouses, the inlet ducts must be measured prior to particulate sampling. These numbers are used to back calculate the flow in the baghouses at each sample point assuming that the flow is uniformly distributed throughout the baghouse.

Conducting method 201A using the cyclone is not technically possible due to limitations in its design. Prior to testing, the proper nozzle must be determined based on duct flow and other preliminary measurements. The cyclone design is based on 10 nozzles of various sizes. The proper nozzle necessary to conduct these tests is far larger than any nozzle provided with the cyclone.

PART V. CEM - ***Not Applicable***

PART VI. OTHER

1. Pollutant(s) to be tested will be reported in terms of the applicable emission limit units.

2. Testing schedules and testing firm.

10/3/05 - Tuesday	*10/4/05 - Wednesday*
Setup	*Test EP1, EP2*

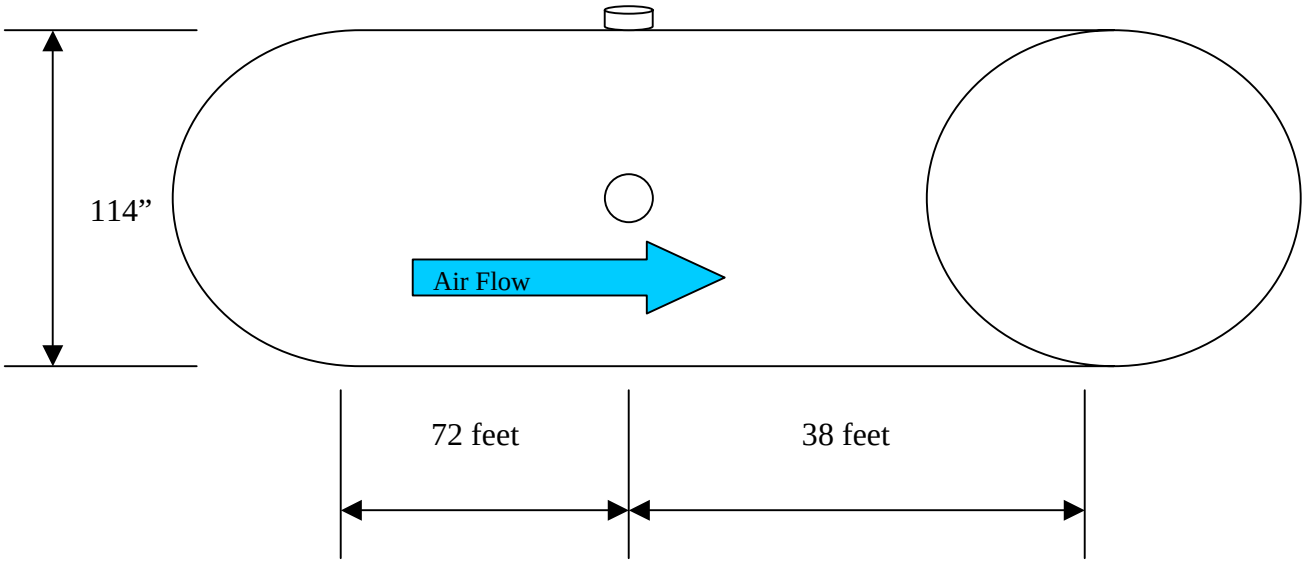
3. Description and date of last maintenance work done before the test: *A description of any maintenance work done before the test and the normal schedule followed will be included as part of the report.*

4. One complete test report (one hard copy) shall be submitted within 45 days after the date of the test. A copy of the report on CD-ROM (Upon Approval *.tif format) shall be submitted within 105 days after the date of the test.

5. Test Plans, Hard Copy Reports, and Microfiche Copy submittals will be addressed to:

Supervisor, Compliance Determination Unit
Compliance & Enforcement Section/AQD
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155-4194

Attachment 1
Emission Point #1
Old Baghouse Inlet Duct



Attachment 2
Emission Point #2
New Baghouse Inlet Duct