

Results of the May 6-8 and 21, 2015 Mercury and Lead Emissions Tests at the U. S. Steel Corporation - Minntac Step I, II and III Agglomerator Facilities Located in Mountain Iron, Minnesota

Line 3 Waste Gas Stack	SV103
Line 4 Waste Gas Stack	SV118
Line 6 Waste Gas Stack	SV144

AQD File No. 26A

Air Emissions Permit No. 13700005-006

Barr Project No. 23691635.00

Prepared for
U. S. Steel Corporation – Minntac
Mountain Iron, Minnesota

July 2015



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Contents

Executive Summary.....	1
1.0 Introduction	2
2.0 Results	4
2.1 Line 3 Waste Gas Stack (SV103).....	4
2.2 Line 4 Waste Gas Stack (SV118).....	4
2.3 Line 6 Waste Gas Stack (SV144).....	4
3.0 Process Description.....	5
4.0 Stack Testing Procedures and Methods.....	6

List of Tables in Text

Table ES-1	Executive Summary Table	1
Table 1	Emission Source Information.....	3
Table 2	EPA Method 1 Criteria.....	6

List of Tables

Table 1	EPA Method 29 Test Results – Line 3 Waste Gas Stack (SV103)
Table 2	EPA Method 29 Test Results – Line 4 Waste Gas Stack (SV118)
Table 3	EPA Method 29 Test Results – Line 6 Waste Gas Stack (SV144)
Table 4	Process Data Summary

List of Figures

Figure 1	Test Port Locations – Step I Agglomerator Line 3 Waste Gas Stack (SV103)
Figure 2	Traverse Point Location – Step I Agglomerator Line 3 Waste Gas Stack (SV103)
Figure 3	Test Port Locations – Step II Agglomerator Line 4 Waste Gas Stack (SV118)
Figure 4	Traverse Point Locations – Step II Agglomerator Line 4 Waste Gas Stack (SV118)
Figure 5	Test Port Locations – Step III Agglomerator Line 6 Waste Gas Stack (SV144)
Figure 6	Traverse Point Locations – Step III Agglomerator Line 6 Waste Gas Stack (SV144)

List of Appendices

Appendix A	Report Calculations and Nomenclature
Appendix B	Field Data Sheets
Appendix C	Laboratory Reports and Sample Chain of Custody
Appendix D	Calibration Data
Appendix E	Process Operating Data
Appendix F	EPA Method 30B
Appendix G	Stack Test Plan
Appendix H	Project Participants and Contact Information

Report Certification

Certification of 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 below.



Dan Koschak
Senior Air Quality Technician
Barr Engineering Company


6-22-15

Date

Certification of Analytical Procedures:

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 the test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below.

1. Element One, Inc. analyzed metals samples. A signed laboratory report is provided in this report.



Matt Morrison
Air Quality Technician
Barr Engineering Company

7/1/15

Date

Certification of Test Report by Testing Company:

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 sampling and analysis relating 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 below.



Tom Kuchinski
Supervisor/Senior Air Quality Technician
Barr Engineering Company

6/30/15

Date

Certification of Test Report by Owner or Operator of 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 below.



Stephani Campbell

Environmental Control Engineer

U. S. Steel Corporation – Minntac



Date

Executive Summary

Barr Engineering Company performed mercury emissions testing at the U. S. Steel Corporation - Minntac Step I, II and III Agglomerator facilities located in Mountain Iron, Minnesota. Testing was performed at three taconite furnace sources May 6-8 and 21, 2015 to satisfy the Minnesota Rule 7019.3050 mercury emission inventory testing requirement. The mercury testing was performed on the Step I Line 3 waste gas stack (SV103), Step II Line 4 waste gas stack (SV118) and the Step III Line 6 waste gas stack (SV144). Line 3 is the only active furnace line of Step I. The Line 4 waste gas stack (SV118) is representative of both Step II furnace line stacks (Line 4 and Line 5) and the Line 6 waste gas stack (SV144) is representative of both Step III furnace line stacks (Line 6 and Line 7). Lead was added to the analysis and is reported for emission inventory purposes. Test results are provided in the Executive Summary Table (Table ES-1).

Table ES-1 Executive Summary Table

Average Test Results			
Test Parameter Methods 1-4, 29	Line 3 Waste Gas Stack (SV103)	Line 4 Waste Gas Stack (SV118)	Line 6 Waste Gas Stack (SV144)
Agglomerator Line	Step I	Step II	Step III
Air Emissions Permit Group	GP009	GP010	GP011
Test Date	5/6-7/15	5/8/15	5/21/15
Total Mercury Emission Rate, lb/hr	0.0022	0.0042	0.0049
Total Lead Emission Rate, lb/hr	0.025	0.039	0.019

1.0 Introduction

Barr Engineering Company performed mercury emissions testing at the U. S. Steel Corporation - Minntac Step I, II and III Agglomerator facilities located in Mountain Iron, Minnesota. Testing was performed at three taconite furnace sources May 6-8 and 21, 2015 to satisfy the Minnesota Rule 7019.3050 mercury emission inventory testing requirement. The mercury testing was performed on the Step I Line 3 waste gas stack (SV103), Step II Line 4 waste gas stack (SV118) and the Step III Line 6 waste gas stack (SV144). Line 3 is the only active furnace line of Step I. The Line 4 waste gas stack (SV118) is representative of both Step II furnace line stacks (Line 4 and Line 5) and the Line 6 waste gas stack (SV144) is representative of both Step III furnace line stacks (Line 6 and Line 7). Lead was added to the analysis and is reported for emission inventory purposes.

A test plan dated March 16, 2015 was submitted to the Minnesota Pollution Control Agency (MPCA). A pretest meeting between Stephani Campbell of U. S. Steel Corporation-Minntac (Minntac), Lad Strzok of the MPCA, and Tom Kuchinski of Barr Engineering Company was held on May 1, 2015. The test plan and relevant correspondence are provided in Appendix G.

Due to changes in production schedules the testing schedule was modified from the test plan. This was communicated to Lad Strzok of the MPCA via email.

Dan Koschak led the Barr test team. Stephani Campbell and Cliff Erickson of Minntac provided coordination of the test team with facility operations. The performance tests were not witnessed by a representative of the MPCA. A list of project participants is provided in Appendix H.

Each test consisted of three independent 2-hour test runs at the three stacks using EPA Method 29 to determine mercury emissions. Filterable particulate matter was determined at the Line 4 waste gas stack (SV118) in conjunction with EPA Method 29. Results of the filterable particulate matter test is located in a separate report. Lead was included in the sample analysis of the EPA Method 29 samples.

A list of the emissions units tested with target process operating rate ranges and applicable rules are presented in Table 1 below. Production rates during the testing were at or above 90 percent of maximum throughput. The Line 3 and Line 4 furnaces were fired with a combination of biomass and natural gas. The Line 6 furnace was fired on natural gas.

Table 1 Emission Source Information

Source	Emissions Unit	Control Equipment	Stack Vent	Permit Group	Greenball Feed Rate (LTPH)	Applicable Rule
Line 3 Waste Gas Stack	EU223 EU225 EU226	CE146	SV103	GP009	280-350	Minn. R. 7019.3050
Line 4 Waste Gas Stack	EU259 EU260 EU261	CE103	SV118	GP010	500-600	Minn. R. 7019.3050
Line 6 Waste Gas Stack	EU313 EU314 EU315	CE126	SV144	GP011	500-600	Minn. R. 7019.3050

2.0 Results

2.1 Line 3 Waste Gas Stack (SV103)

Results of the Line 3 waste gas stack test (SV103) performed on May 6-7, 2015 are provided in Table 1. The average emission rate of total mercury is 0.0022 pounds per hour (lb/hr). The average lead emission rate is 0.025 lb/hr. Test run one was completed on May 6. Run 1 was interrupted for 111 minutes due to a process upset. Test runs two and three were completed on May 7. Run three was interrupted two times, once for 45 minutes due to a process upset and for 34 minutes due to a problem with the testing equipment. Results of the first test run appear to be an anomaly when compared to runs two and three. No other testing difficulties were noted.

2.2 Line 4 Waste Gas Stack (SV118)

Results of the Line 4 waste gas stack (SV118) test performed on May 8, 2015 are provided in Table 2. The average emission rate of total mercury is 0.0042 lb/hr. The average lead emission rate is 0.039 lb/hr. During the sample recovery of run two, the rinse from the fourth impinger was inadvertently included with the sample for impingers 1-3 ($\text{HNO}_3/\text{H}_2\text{O}_2$). Since the mass of mercury (if present, all other fourth impinger results were below the detection limit) would be accounted for in the analysis, this error is expected to have a minimal effect on the results. No other testing difficulties were noted.

2.3 Line 6 Waste Gas Stack (SV144)

Results of the Line 6 waste gas stack (SV144) test performed on May 21, 2015 are provided in Table 3. The average emission rate of total mercury is 0.0049 lb/hr. The average lead emission rate is 0.019 lb/hr. Test run one was delayed 131 minutes due to a process upset condition. No other testing difficulties were noted.

Test run times are provided in the tables. Test interruptions are noted on the field data sheets located in Appendix B.

All processes were operating at greater than 90 percent of maximum production. A summary of the process rates during the testing periods is provided in Table 4. Detailed process data are located in Appendix E.

3.0 Process Description

The Agglomerator grate-kiln system consists of four primary components; the dryer, preheat furnace, kiln, and cooler. Green pellets from the balling drums enter the grate, supported by a slotted grate. The grate is divided into three sections: two for drying and one for preheating the pellets. Hot process gases are passed through the bed of the green pellets on the grate in order to first dry and then preheat them. The grate then transports the pellets into the rotary kiln. In the kiln, the pellets are tumbled and indurated (heat hardened) by heating them to 2450° F. The pellets are discharged into an annular cooler with slotted traveling pallets. Ambient air is passed through the bed of pellets in the cooler to cool the pellets and recover heat. The waste gases from each kiln are controlled by separate wet scrubbers.

Process rate parameters recorded and summarized for each run include green ball feed rate and fired pellet production rate. Scrubber water flow rate and pressure drop were recorded for each scrubber. The process operating data are summarized in Table 4. Detailed process data along with completed MPCA Operating Data Summary for Process Sources forms are located in Appendix E.

4.0 Stack Testing Procedures and Methods

Testing was performed at locations meeting EPA method 1 criteria. Method criteria are listed below in Table 2. Sample port locations and traverse points are provided in Figures 1-6.

Table 2 EPA Method 1 Criteria

Stack Vent Number	Distance to Upstream Disturbances (Diameters)	Distance to Downstream Disturbances (Diameters)	Number of Ports	Number of Points
SV103	>2.0	>0.5	4	24
SV118	4.1	2.4	4	24
SV144	2.4	1.6	4	24

Volumetric airflow determinations were performed in accordance with EPA Method 2 using an S-type pitot tube. Airflows were determined in conjunction with the EPA Method 29 tests.

Oxygen and carbon dioxide concentrations at the waste gas stacks were determined from integrated stack gas samples collected with each test run and analyzed by modified EPA Method 3A. Results of those analyses are located in Appendix B. Gas calibration certifications are provided in Appendix D.

Stack gas moistures were determined by performing EPA Method 4 in conjunction with the EPA Method 29 tests.

Mercury and lead were determined following EPA Method 29. All glassware used for the testing was prepared as directed by the method. All reagents were prepared at Barr's laboratory except for the acidified potassium permanganate solution which was prepared on-site daily prior to sampling. Sample recovery was performed in Barr Engineering's recovery trailer to minimize potential for sample contamination. Samples were analyzed by Element One, Inc. of Wilmington, North Carolina. A complete laboratory report along with chain of custody is located in Appendix C.

Two sets of reagent blanks were analyzed as testing occurred on separate weeks. Mercury levels in all reagent blanks were below analytical detection limits. No blank corrections were performed. Sample fractions reported at the analytical detection limit are included in the total mass of the sample.

The test methods referenced above are found in 40 CFR Part 60, Appendix A.

Tables

TABLE 1
EPA METHOD 29 TEST RESULTS
Line 3 Waste Gas Stack (SV103)

Parameter	Run 1	Run 2	Run 3	Average
Test Date	5/6/2015	5/7/2015	5/7/2015	---
Test Period	1616 - 2022	807 - 1022	1054 - 1413	---
Test Duration, min.	120	120	120	120
Meter Volume, dscf	106.38	102.08	100.80	103.09
Volumetric Airflow Rate, dscfm	216,000	213,000	212,000	214,000
Metals Concentrations, µg/dscf				
Lead	1.054	0.805	0.751	0.870
Mercury Concentration, µg/dscf				
Filterable Mercury	0.027	0.0058	0.0027	0.012
Vapor Phase Mercury	0.062	0.062	0.072	0.065
Total Mercury	0.089	0.068	0.075	0.077
Mercury Concentration, µg/dscm				
Total Mercury	3.16	2.40	2.64	2.73
Metals Emission Rates, lb/hr				
Lead	0.030	0.023	0.021	0.025
Mercury Emission Rate, lb/hr				
Filterable Mercury	0.00078	0.00016	0.00008	0.00034
Vapor Phase Mercury	0.0018	0.0018	0.0020	0.0018
Total Mercury	0.0026	0.0019	0.0021	0.0022
Process Data				
Greenball Feed Rate, LTPH	300	295	297	297
Fired Pellet Production Rate, LTPH	239	235	238	237
Emission Factors				
Lead lb/LT Fired Pellet	1.3E-04	9.6E-05	8.8E-05	1.0E-04
Total Mercury lb/LT Fired Pellet	1.1E-05	8.1E-06	8.8E-06	9.2E-06

TABLE 2
EPA METHOD 29 TEST RESULTS
Line 4 Waste Gas Stack (SV118)

Parameter	Run 1	Run 2	Run 3	Average
Test Date	5/8/2015	5/8/2015	5/8/2015	---
Test Period	757 - 1006	1038 - 1250	1318 - 1530	---
Test Duration, min.	120	120	120	120
Meter Volume, dscf	82.25	83.07	82.92	82.75
Volumetric Airflow Rate, dscfm	434,000	434,000	434,000	434,000
Metals Concentrations, µg/dscf				
Lead	0.532	0.743	0.777	0.684
Mercury Concentration, µg/dscf				
Filterable Mercury	0.005	0.005	0.002	0.004
Vapor Phase Mercury	0.064	0.070	0.071	0.068
Total Mercury	0.070	0.075	0.073	0.073
Mercury Concentration, µg/dscm				
Total Mercury	2.46	2.66	2.59	2.57
Metals Emission Rates, lb/hr				
Lead	0.031	0.043	0.045	0.039
Mercury Emission Rate, lb/hr				
Filterable Mercury	0.00031	0.00031	0.00013	0.00025
Vapor Phase Mercury	0.0037	0.0040	0.0041	0.0039
Total Mercury	0.0040	0.0043	0.0042	0.0042
Process Data				
Greenball Feed Rate, LTPH	518	516	518	517
Fired Pellet Production Rate, LTPH	393	391	391	391
Emission Factors				
Lead lb/LT Fired Pellet	7.8E-05	1.1E-04	1.1E-04	1.0E-04
Total Mercury lb/LT Fired Pellet	1.0E-05	1.1E-05	1.1E-05	1.1E-05

TABLE 3
EPA METHOD 29 TEST RESULTS

Line 6 Waste Gas Stack (SV144)

Parameter	Run 1	Run 2	Run 3	Average
Test Date	5/21/2015	5/21/2015	5/21/2015	---
Test Period	815 - 1236	1316 - 1534	1613 - 1826	---
Test Duration, min.	120	120	120	120
Meter Volume, dscf	75.36	78.19	76.37	76.64
Volumetric Airflow Rate, dscfm	362,000	374,000	365,000	367,000
Metals Concentrations, µg/dscf				
Lead	0.391	0.385	0.369	0.382
Mercury Concentration, µg/dscf				
Filterable Mercury	0.004	0.005	0.003	0.004
Vapor Phase Mercury	0.088	0.092	0.108	0.096
Total Mercury	0.092	0.097	0.111	0.100
Mercury Concentration, µg/dscm				
Total Mercury	3.24	3.41	3.93	3.53
Metals Emission Rates, lb/hr				
Lead	0.019	0.019	0.018	0.019
Mercury Emission Rate, lb/hr				
Filterable Mercury	0.00019	0.00023	0.00017	0.00020
Vapor Phase Mercury	0.0042	0.0046	0.0052	0.0047
Total Mercury	0.0044	0.0048	0.0054	0.0049
Process Data				
Greenball Feed Rate, LTPH	520	519	516	518
Fired Pellet Production Rate, LTPH	389	394	386	390
Emission Factors				
Lead lb/LT Fired Pellet	4.8E-05	4.8E-05	4.6E-05	4.8E-05
Total Mercury lb/LT Fired Pellet	1.1E-05	1.2E-05	1.4E-05	1.2E-05

TABLE 4
Process Data Summary

Line 3 Waste Gas Stack (SV103)

5/6/2015 & 5/7/2015

Run	Time		Feed Rates LTPH		Prod. Rate	Wood			Gas MBTUH		Total MBTUH	Scrubber	
	Start	End	Green ball	To Grate	LTPH	lbs/min	MMBTU/ton	MBTUH	Grate	Kiln		dP inches WC	Water Flow gpm
1*	16:16	20:22	300.2	284.0	238.5	50	16.9	25.4	44.0	105.5	167.0	11.8	2,452
2	8:07	10:22	295.2	280.2	235.3	49	16.9	25.0	43.5	98.5	166.5	11.5	2,450
3*	10:54	14:13	297.0	283.0	237.7	50	16.9	25.3	42.6	98.7	166.5	11.9	2,448

*data excludes periods of no testing

Line 4 Waste Gas Stack (SV118)

5/8/2015

Run	Time		Feed Rates LTPH		Prod. Rate	Wood			Gas MBTUH		Total MBTUH	Scrubber	
	Start	End	Green ball	To Grate	LTPH	lb/min	MMBTU/ton	MBTUH	Grate	Kiln		dP inches WC	Water Flow gpm
1	7:57	10:06	518	473	393	204	16.9	103.2	91.9	87.0	282.0	10.6	2,901
2	10:38	12:50	516	471	391	204	16.9	103.3	91.6	86.7	281.6	10.7	2,896
3	13:18	15:30	518	471	391	204	16.9	103.2	91.2	86.4	280.9	10.7	2,897

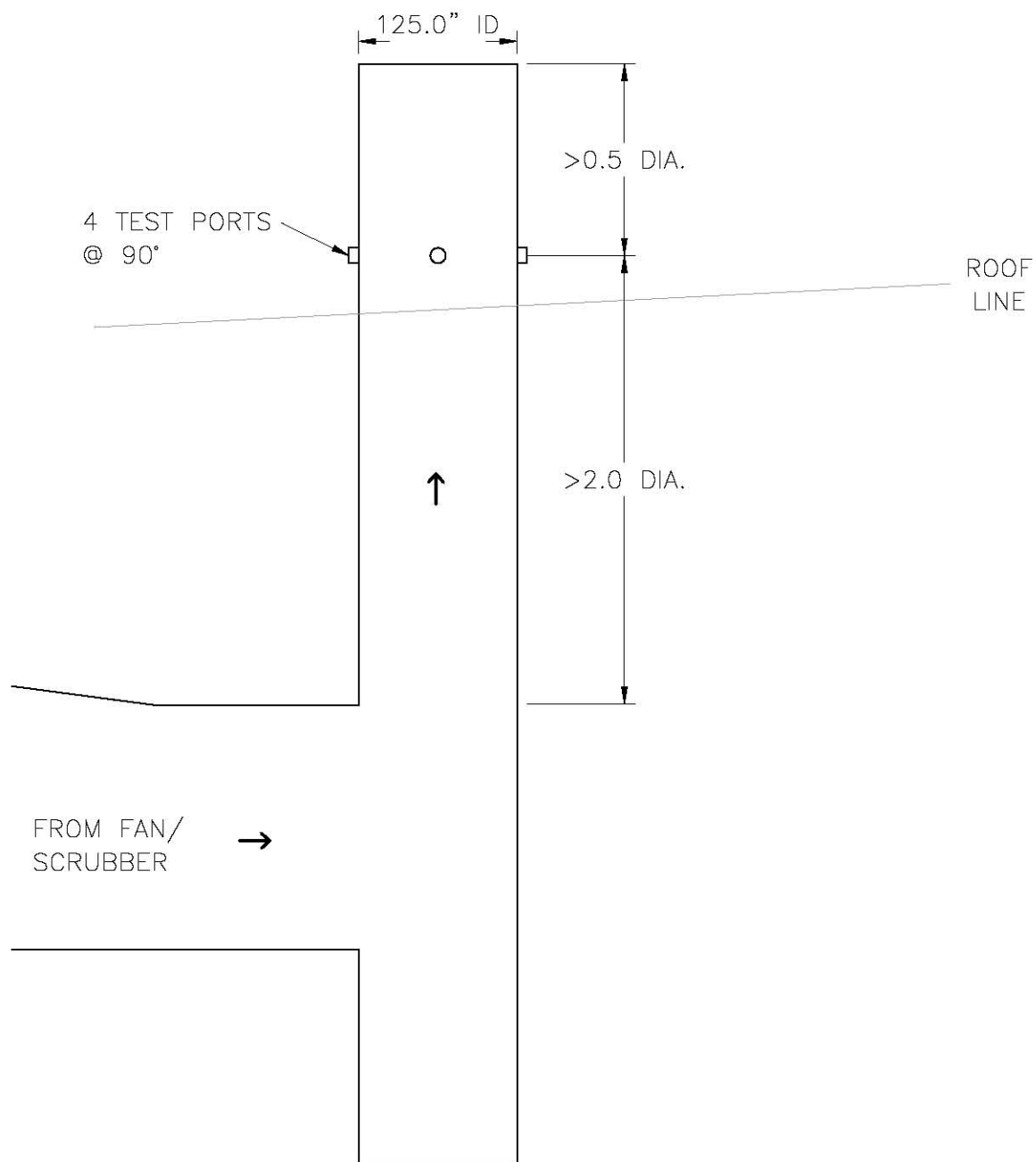
Line 6 Waste Gas Stack (SV144)

5/21/15

Run	Time		Feed Rates LTPH		Prod. Rate	Gas MBTUH			Scrubber		
	Start	End	Green ball	To Grate	LTPH	Grate	Kiln	Total MBTUH	dP inches WC	Water Flow gpm	
1*	8:15-8:46, 10:57-12:36		520	458	389	84.2	119.2	203.4	9.1	2,999	
2	13:16	15:34	519	464	394	83.9	108.7	192.5	9.4	2,990	
3	16:13	18:26	516	455	386	83.2	114.7	197.9	9.2	3,000	

*data excludes periods of no testing

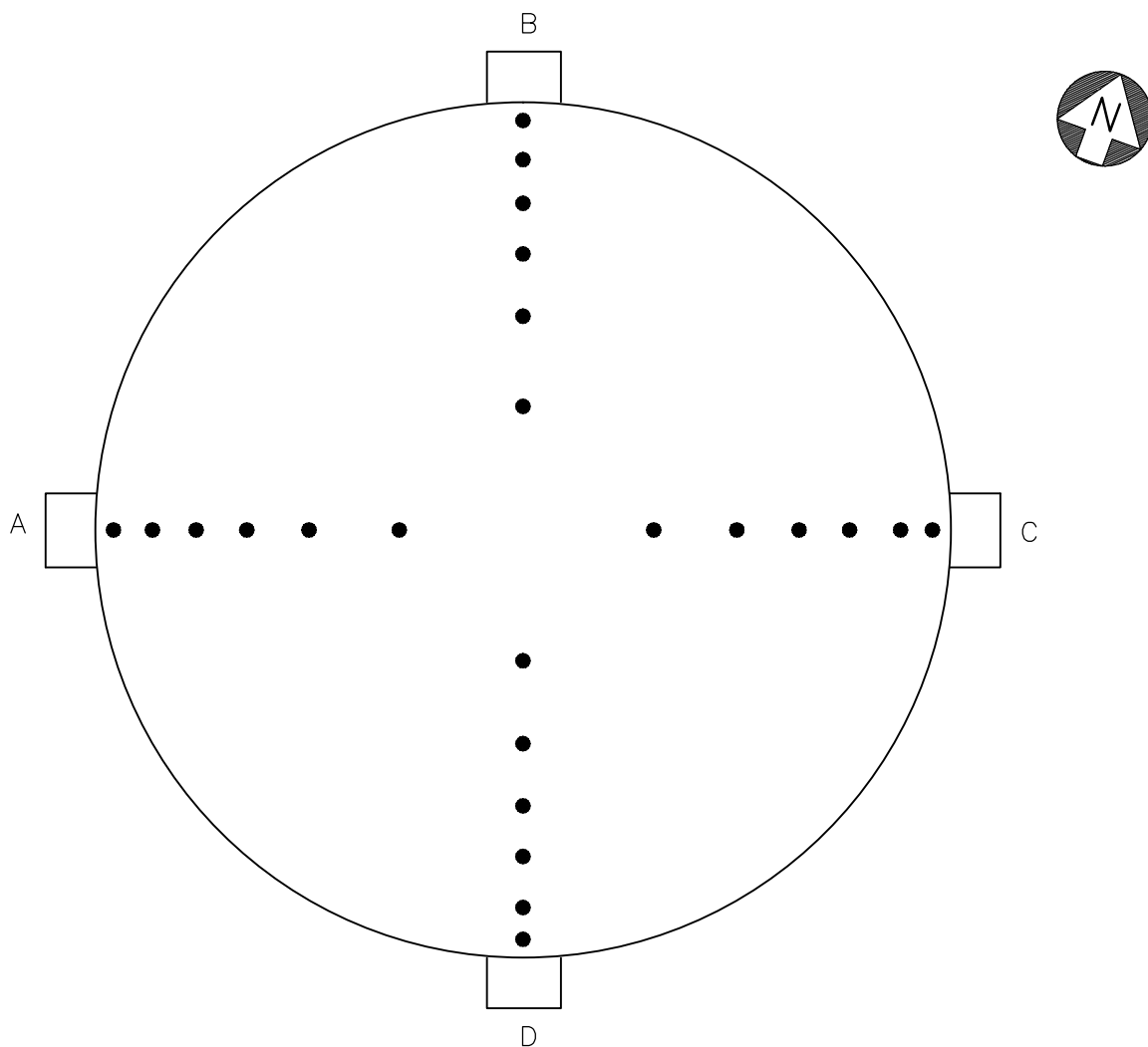
Figures



TEST PORT LOCATION
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP 1 AGGLOMERATOR LINE 3 WASTE GAS STACK (SV103)

NOT TO SCALE

FIGURE 1



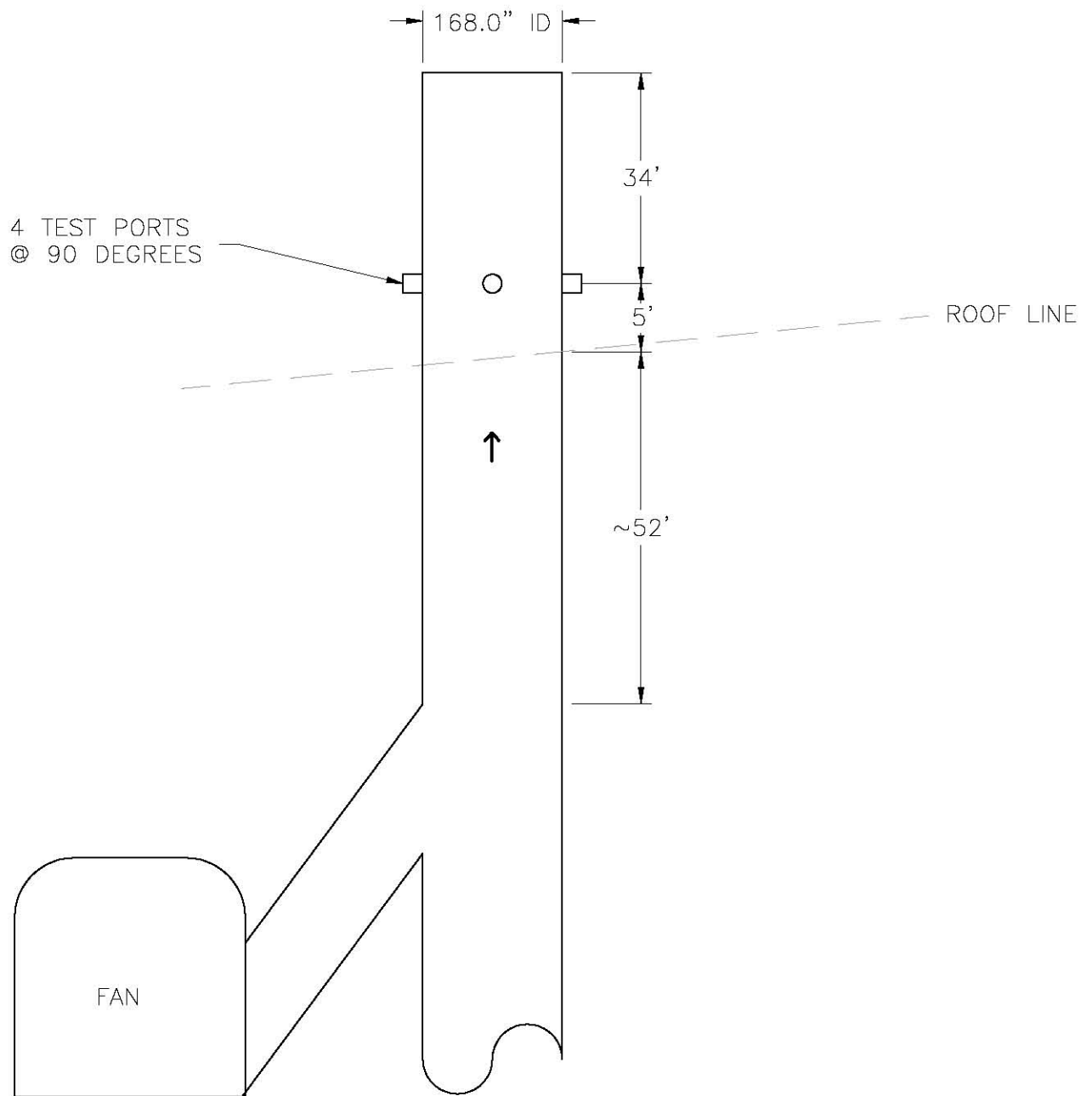
NO. OF TEST PORTS	4
PORT LENGTH	7.0"
PORT DIAMETER	6"
NO. OF TRAVERSE POINTS	24
DUCT DIAMETER	125"

POINT	INSERTION DEPTH IN "
1	2.66
2	8.37
3	14.76
4	22.16
5	31.25
6	44.46

TRAVERSE POINT LOCATION
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP 1 AGGLOMERATOR LINE 3 WASTE GAS STACK (SV103)

NOT TO SCALE

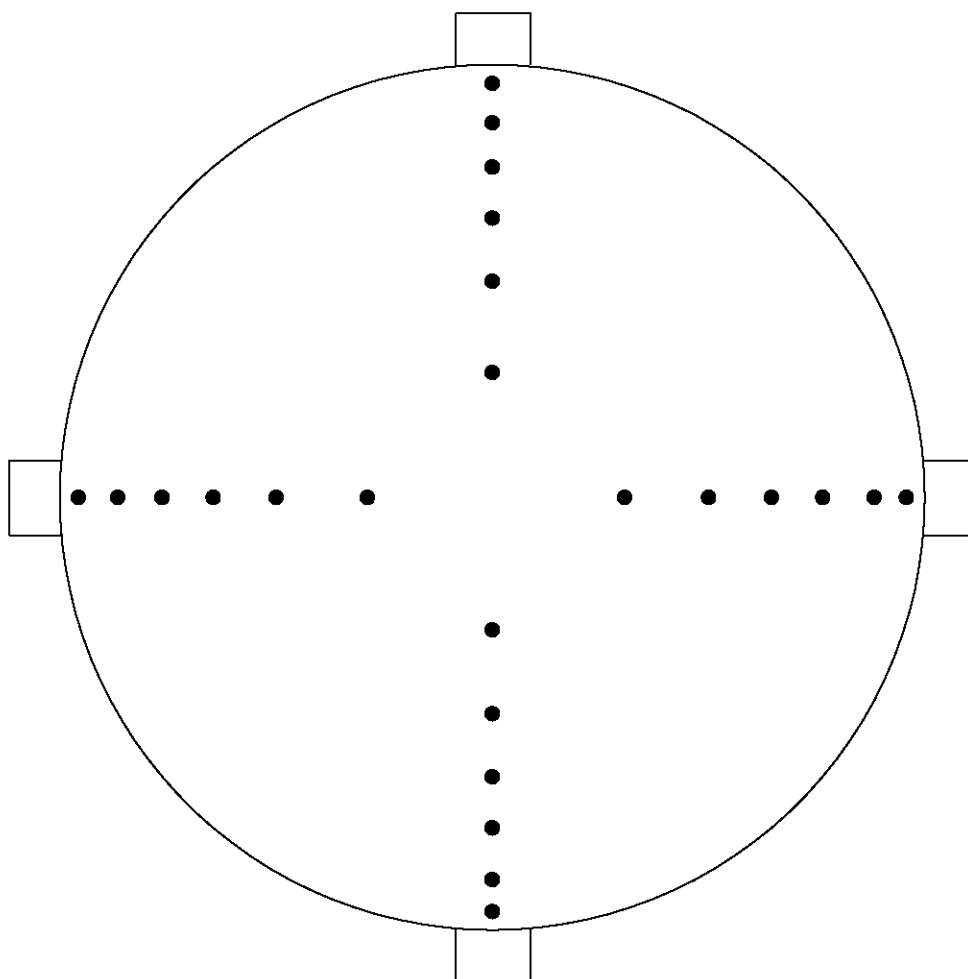
FIGURE 2



TEST PORT LOCATIONS
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP II AGGLOMERATOR LINE 4 WASTE GAS STACK (SV118)

NOT TO SCALE

FIGURE 3



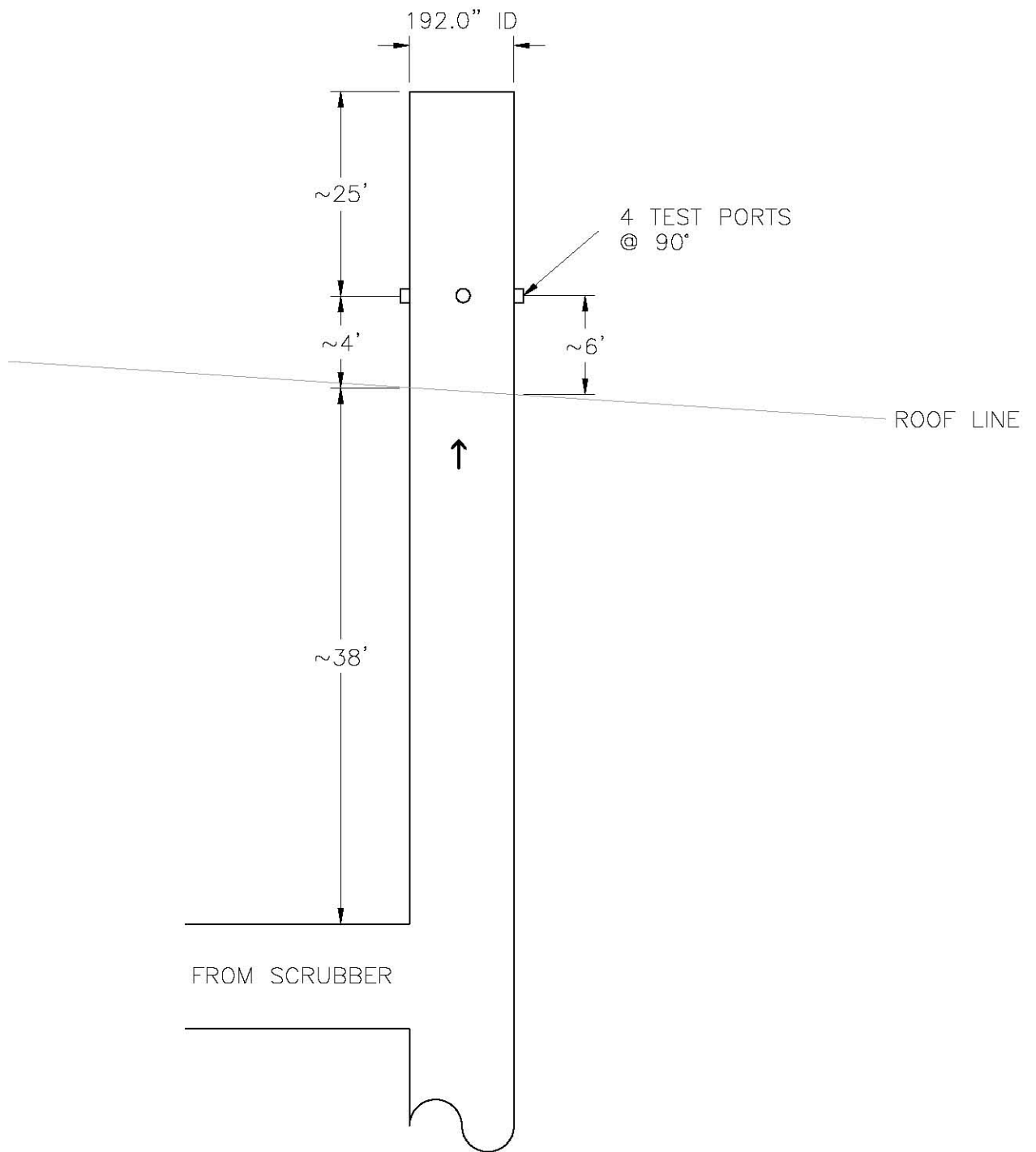
NO. OF TEST PORTS	4
PORT LENGTH	23.0"
PORT DIAMETER	6.0"
NO. OF TRAVERSE POINTS	24
DUCT DIAMETER	168.0"

POINT	INSERTION DEPTH IN "
1	3.58
2	11.25
3	19.84
4	29.78
5	42.00
6	59.75

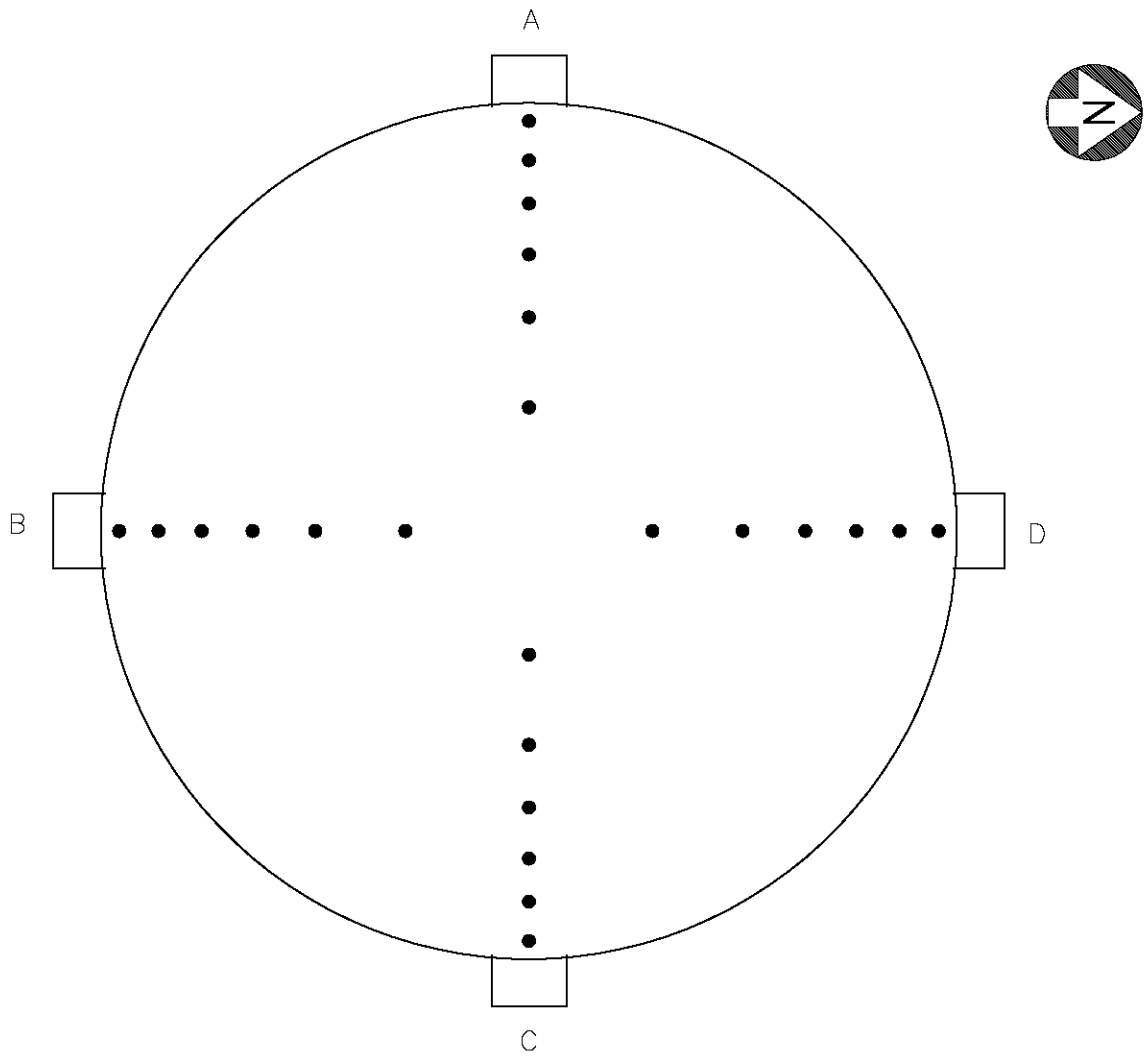
TRAVERSE POINT LOCATIONS
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP II AGGLOMERATOR LINE 4 WASTE GAS STACK (SV118)

NOT TO SCALE

FIGURE 4



TEST PORT LOCATIONS
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP III AGGLOMERATOR LINE 6 WASTE GAS STACK (SV144)



NO. OF TEST PORTS	4
PORT LENGTH	15.0"
PORT DIAMETER	6.0"
NO. OF TRAVERSE POINTS	24
DUCT DIAMETER	192.0"

POINT	INSERTION DEPTH IN "
1	4.09
2	12.86
3	22.68
4	34.03
5	48.00
6	68.29

TRAVERSE POINT LOCATIONS
 US STEEL MINNESOTA ORE OPERATIONS
 MOUNTAIN IRON, MINNESOTA
 STEP III AGGLOMERATOR LINE 6 WASTE GAS STACK (SV144)

NOT TO SCALE

FIGURE 6

Appendices

Appendix A

Report Calculations and Nomenclature

Determination of Volumetric Air Flow Rate, Gas Composition, Moisture Content, Sample Volume and Isokinetics

EPA Methods 2, 3, 4, and 29
Line 3 Waste Gas Stack (SV103)

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test Date	-	-	5/6/2015	5/7/2015	5/7/2015
Test Period	-	-	1616 - 2022	807 - 1022	1054 - 1413
Number of Sample Ports	-	-	4	4	4
Number of Traverse Points	-	-	24	24	24
Duct Dimensions (diameter or Length x Width)	D, L X W	inches	125.00	125.00	125.00
Barometric Pressure	Pbar	in. Hg	28.32	28.04	28.04
Stack Static Pressure	Pg	in. H ₂ O	-0.41	-0.41	-0.41
Average Stack Temperature	Tsf	degrees F	131	131	132
Actual Dry Gas Meter Volume	Vm	cubic feet	112.88	109.75	108.80
Dry Gas Meter Calibration Factor	Y	-	1.0007	1.0007	1.0007
Average Orifice Meter Pressure Drop	DH	in H ₂ O	2.82	2.62	2.57
Average Meter Temperature	Tmf	degrees F	74	76	78
Pitot Tube Coefficient	Cp	-	0.84	0.84	0.84
Average Square Root of Velocity Head	(DP) ^{0.5}	-	0.946	0.942	0.933
Volume of Water Vapor Condensed in Impingers	Vwc	ml	486	386	384
Mass of Water Vapor Collected in Desiccant	Vwsg	g	26	27	18
Orsat Results, Dry Basis					
Oxygen	%O ₂	%v/v	16.8	16.9	16.8
Carbon Dioxide	%CO ₂	%v/v	2.90	2.90	2.90
Nitrogen + Carbon Monoxide	%N ₂ + %CO	%v/v	80.3	80.2	80.3
Nozzle Diameter	Dn	inches	0.250	0.250	0.250
Run Time	theta	minutes	120	120	120
Calculated Data	Symbol	Units	Run 1	Run 2	Run 3
Average Absolute Stack Temperature Tsr = Tsf + 460	Tsr	degrees R	591	591	592
Stack Pressure Ps = Pbar + Pg / 13.6	Ps	in. Hg	28.29	28.01	28.01
Duct Area A = 3.14 x D ² / (4 x 144) or A = L x W / 144	A	Sq. ft	85.221	85.221	85.221
Meter Volume at Standard Conditions Vmstd = 17.64 x Vm x Y x ((Pbar + (DH / 13.6)) / (Tmf + 460))	Vmstd	cubic feet	106.38	102.08	100.80
Average Moisture Content of Stack Gas MC = ((0.04707 x Vwc + 0.04715 x Vwsg) / ((0.04707 x Vwc + 0.04715 x Vwsg) + (Vmstd)) x 100	MC	% Vol	15.72	15.99	15.81
		see note			
Molecular Weight of Stack Gas, dry Md = (0.44 x %CO ₂) + (0.32 x %O ₂) + (0.28 x (%N ₂ + %CO))	Md	lb/lbmol	29.14	29.14	29.14
Molecular Weight of Stack Gas, wet Ms = Md x (1 - (MC/100)) + 18 x (MC/100)	Ms	lb/lbmol	27.39	27.36	27.38
Average Stack Gas Velocity Vs = 85.49 x Cp x (dP) ^{0.5} x ((Tsr/(Ps x Ms)) ^{0.5})	Vs	ft/sec	59.35	59.40	58.86
Actual Volumetric Air Flow Rate Qa = 60 x Vs x A	Qa	acfm	303,480	303,721	300,966
Volumetric Air Flow Rate at Standard Conditions Qs = Qa x (528 / (Ts + 460)) x (Ps / 29.92)	Qs	scfm	256,430	253,950	251,416
Dry Volumetric Air Flow Rate at Standard Conditions Qd = Qa x (1 - (MC / 100)) x (528 / Tsr) x (Ps / 29.92)	Qd	dscfm	216,119	213,354	211,668
Nozzle Cross-Sectional Area An = (3.14 x Dn ²) / (4 x 144)	An	sq. ft	0.000341	0.000341	0.000341
Isokinetic Variation I = (0.0945 x Tsr x Vmstd) / (Ps x Vs x An x theta x (1 - (MC / 100)))	I	%	102.6	99.8	99.3

Note: Moisture Content limited to moisture at saturation

Results of the Method 29 Metals Analysis

Line 3 Waste Gas Stack (SV103)

Front Half (Filterable), µg

QA / QC Results

Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	0.280	81.8	82.4

Sample Results

Run 1	Average Run 2 and Run 2 Dup.	Run 3
112	82.1	75.4

Blank Corrected Results^{(1),(2)}

Run 1	Run 2	Run 3
111.7	81.8	75.1

Back Half, µg

QA / QC Results

Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	< 0.10	0.309	0.304

Sample Results

Run 1	Average Run 2 and Run 2 Dup.	Run 3
0.392	0.307	0.551

Blank Corrected Results^{(1),(2)}

Run 1	Run 2	Run 3
0.392	0.307	0.551

(1) Italics represent blank corrected values limited to zero

(2) If blank result is less than the detection limit, zero is used to calculate the blank corrected result

Laboratory Results Summary of EPA Method 29 Mercury Analysis
From Sub-Contracted Mercury Analysis
Line 3 Waste Gas Stack (SV103)

Method 29 Mercury Mass Determination

Front Half (Filterable)

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blank (MHg _{fthb})
Analysis #1, Total	--	µg	2.91	0.596	0.274	< 0.1
Analysis #2, Total	--	µg	2.90	0.597	0.270	< 0.1
Front Half Net Mass Hg, Average	MHg _{fthm}	µg	2.91	0.60	0.27	< 0.1

Back Half

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blanks
10% H ₂ O ₂ / 5% HNO ₃						
Analysis #1, Total µg	--	µg	0.671	0.912	1.38	< 0.2
Analysis #2, Total µg	--	µg	0.736	0.973	1.40	< 0.2
Net Mass Average	MHg _{bh2}	µg	0.70	0.94	1.39	< 0.2

Empty Impinger

Analysis #1, Total µg	--	µg	< 0.20	< 0.20	< 0.20	< 0.2
Analysis #2, Total µg	--	µg	< 0.20	< 0.20	< 0.20	< 0.2
Net Mass Average	MHg _{bh3A}	µg	< 0.20	< 0.20	< 0.20	< 0.2

KMnO₄

Analysis #1, Total µg	--	µg	0.889	0.822	1.030	< 0.5
Analysis #2, Total µg	--	µg	0.904	0.805	1.050	< 0.5
Net Mass Average	MHg _{bh3B}	µg	0.897	0.814	1.040	< 0.5

HCl

Analysis #1, Total	--	µg	4.85	4.40	4.61	< 0.4
Analysis #2, Total	--	µg	4.78	4.37	4.63	< 0.4
Net Mass Average	MHg _{bh3C}	µg	4.82	4.39	4.62	< 0.4

Total Back Half Net Mass Hg, Average MHg _{bhm} = M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C})	MHg _{bhm}	µg	6.62	6.34	7.25	
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Blank Correction Determination

Back Half Blank MHg _{bhb} =M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C})/blanks	MHg _{bhb}	µg	0.00			
			5% of the Total Net Mass			
	--	µg	0.48	0.35	0.38	MHg _{fthb} +MHg _{bhb} 0.10
Total Blank Correction Amount ⁽¹⁾	MHg _{blank}	µg	0.00	0.00	0.00	

Mercury Mass Determinations

Front Half (Filterable) Mercury Mass MHg _{fth} = MHg _{fthm} - MHg _{fthb}	MHg _{fth}	µg	2.91	0.60	0.27	
Back Half Mercury Mass MHg _{bh} = MHg _{bhm} - MHg _{bhb}	MHg _{bh}	µg	6.62	6.34	7.25	
Final Total Mercury Mass⁽²⁾ MHg _t = (MHg _{fthm} + MHg _{bhm}) - MHg _{blank}	MHg _t	µg	9.52	6.94	7.52	

Note: The "<" sign indicates the mass is below method detection limits. All calculations forward use the detection limit for concentration and emission determinations and no blank correction is made.

(1) If the total of the measured blank values (MHg_{fthb}+MHg_{bhb}) is in the range of 0.0 to 0.6µg then use the total; if it exceeds 0.6µg, use the greater of (I) or (II). (I) 0.6µg (II) the lesser of (a) (MHg_{fthb}+MHg_{bhb}) or (b) 5% of the sample value.

(2) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the total mercury mass may not necessarily be equal to (MHg_{fth}+MHg_{bh}).

Determination of Metals Emissions
EPA Method 29

Line 3 Waste Gas Stack (SV103)

Input Data	Symbol	Units	Run 1	Run 2	Run 3			
Test Date	-	-	5/6/2015	5/7/2015	5/7/2015			
Test Period	-	-	1616 - 2022	807 - 1022	1054 - 1413			
Run Time	Θ	min	120	120	120			
Oxygen Concentration, % dry	O ₂ %	%	16.80	16.90	16.80			
Dry Volumetric Flowrate at Standard Conditions	Qd	dscfm	216,119	213,354	211,668			
Meter Volume at Standard Conditions	Vmstd	cubic feet	106.38	102.08	100.80			
Sample Loadings (From Lab Results)								
			Front Half	Back Half	Front Half	Back Half	Front Half	Back Half
Lead	M _{FH} M _{BH}	μg	111.720	0.392	81.820	0.307	75.120	0.551
Mercury ⁽¹⁾	MHg _{FH} MHg _{BH}	μg	2.905	6.615	0.597	6.341	0.272	7.250
Total Mercury ⁽²⁾	MHg _t	μg	9.520		6.938		7.522	
Calculated Data	Symbol	Units	Run 1		Run 2		Run 3	
Metals Concentrations: $C = (M_{FH} + M_{BH}) / (Vmstd)$								
Lead	C _(Pb)	μg/dscf	1.0539		0.8045		0.7507	
Mercury Concentration: $C = MHg / (Vmstd)$								
Front Half (Filterable) Mercury	C _(HgFH)	μg/dscf	0.0273		0.0058		0.0027	
Back Half Mercury	C _(HgBH)	μg/dscf	0.0622		0.0621		0.0719	
Total Mercury Concentration	C _(Hg)	μg/dscf	0.0895		0.0680		0.0746	
Metals Concentrations: $C = ug/dscf \times 35.315$								
Total Mercury Concentration	C _(Hg)	μg/dscm	3.160		2.400		2.635	
Metals Emission Rates: $E = (M_{FH} + M_{BH}) \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^{-3} \times Qd \times 60$								
Lead	E _(Pb)	lb/hr	0.030		0.023		0.021	
Mercury Emission Rates: $E = MHg \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^{-3} \times Qd \times 60$								
Front Half (Filterable) Mercury	E _(HgFH)	lb/hr	0.00078		0.00016		0.000076	
Back Half Mercury	E _(HgBH)	lb/hr	0.0018		0.0018		0.0020	
Total Mercury	E _(Hg)	lb/hr	0.0026		0.0019		0.0021	

(1) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the Total Mercury Mass may not necessarily be equal to (MHg_{FH}+MHg_{BH}).

(2) Calculated per EPA Method 29

Determination of Volumetric Air Flow Rate, Gas Composition, Moisture Content, Sample Volume and Isokinetics

EPA Methods 2, 3, 4, and 29
Line 4 Waste Gas Stack (SV118)

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test Date	-	-	5/8/2015	5/8/2015	5/8/2015
Test Period	-	-	757 - 1006	1038 - 1250	1318 - 1530
Number of Sample Ports	-	-	4	4	4
Number of Traverse Points	-	-	24	24	24
Duct Dimensions (diameter or Length x Width)	D, L X W	inches	168.00	168.00	168.00
Barometric Pressure	Pbar	in. Hg	28.14	28.14	28.14
Stack Static Pressure	Pg	in. H ₂ O	-1.00	-1.00	-1.00
Average Stack Temperature	Tsf	degrees F	121	121	120
Actual Dry Gas Meter Volume	Vm	cubic feet	85.75	87.36	88.04
Dry Gas Meter Calibration Factor	Y	-	0.9959	0.9959	0.9959
Average Orifice Meter Pressure Drop	DH	in H ₂ O	1.78	1.84	1.84
Average Meter Temperature	Tmf	degrees F	58	62	67
Pitot Tube Coefficient	Cp	-	0.84	0.84	0.84
Average Square Root of Velocity Head	(DP) ^{0.5}	-	1.009	1.010	1.007
Volume of Water Vapor Condensed in Impingers	Vwc	ml	219	225	217
Mass of Water Vapor Collected in Desiccant	Vwsg	g	17	16	18
Orsat Results, Dry Basis					
Oxygen	%O ₂	%v/v	17.3	17.2	17.3
Carbon Dioxide	%CO ₂	%v/v	2.80	2.80	2.80
Nitrogen + Carbon Monoxide	%N ₂ + %CO	%v/v	79.9	80.0	79.9
Nozzle Diameter	Dn	inches	0.214	0.214	0.214
Run Time	theta	minutes	120	120	120
Calculated Data	Symbol	Units	Run 1	Run 2	Run 3
Average Absolute Stack Temperature Tsr = Tsf + 460	Tsr	degrees R	581	581	580
Stack Pressure Ps = Pbar + Pg / 13.6	Ps	in. Hg	28.07	28.07	28.07
Duct Area A = 3.14 x D ² / (4 x 144) or A = L x W / 144	A	Sq. ft	153.938	153.938	153.938
Meter Volume at Standard Conditions Vmstd = 17.64 x Vm x Y x ((Pbar + (DH / 13.6)) / (Tmf + 460))	Vmstd	cubic feet	82.25	83.07	82.92
Average Moisture Content of Stack Gas MC = ((0.04707 x Vwc + 0.04715 x Vwsg) / ((0.04707 x Vwc + 0.04715 x Vwsg) + (Vmstd)) x 100	MC	% Vol	11.88	12.02	11.78
Molecular Weight of Stack Gas, dry Md = (0.44 x %CO ₂) + (0.32 x %O ₂) + (0.28 x (%N ₂ + %CO))	Md	lb/lbmol	29.14	29.14	29.14
Molecular Weight of Stack Gas, wet Ms = Md x (1 - (MC/100)) + 18 x (MC/100)	Ms	lb/lbmol	27.82	27.80	27.83
Average Stack Gas Velocity Vs = 85.49 x Cp x (dP) ^{0.5} x ((Tsr/(Ps x Ms)) ^{0.5})	Vs	ft/sec	62.54	62.59	62.33
Actual Volumetric Air Flow Rate Qa = 60 x Vs x A	Qa	acfm	577,663	578,132	575,679
Volumetric Air Flow Rate at Standard Conditions Qs = Qa x (528 / (Ts + 460)) x (Ps / 29.92)	Qs	scfm	492,270	493,270	491,813
Dry Volumetric Air Flow Rate at Standard Conditions Qd = Qa x (1 - (MC / 100)) x (528 / Tsr) x (Ps / 29.92)	Qd	dscfm	433,798	433,997	433,900
Nozzle Cross-Sectional Area An = (3.14 x Dn ²) / (4 x 144)	An	sq. ft	0.000250	0.000250	0.000250
Isokinetic Variation I = (0.0945 x Tsr x Vmstd) / (Ps x Vs x An x theta x (1 - (MC / 100)))	I	%	97.5	98.4	98.2

Results of the Method 29 Metals Analysis

Line 4 Waste Gas Stack (SV118)

Front Half (Filterable), µg

QA / QC Results			
Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	0.280	61.7	61.7

Sample Results		
Run 1	Average Run 2 and Run 2 Dup.	Run 3
43.6	61.7	64.3

Blank Corrected Results ^{(1),(2)}		
Run 1	Run 2	Run 3
43.320	61.420	64.020

Back Half, µg

QA / QC Results			
Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	< 0.1	0.322	0.328

Sample Results		
Run 1	Average Run 2 and Run 2 Dup.	Run 3
0.447	0.325	0.437

Blank Corrected Results ^{(1),(2)}		
Run 1	Run 2	Run 3
0.447	0.325	0.437

(1) Italics represent blank corrected values limited to zero

(2) If blank result is less than the detection limit, zero is used to calculate the blank corrected result

Laboratory Results Summary of EPA Method 29 Mercury Analysis
From Sub-Contracted Mercury Analysis
Line 4 Waste Gas Stack (SV118)

Method 29 Mercury Mass Determination

Front Half (Filterable)

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blank (MHg _{fthb})
Analysis #1, Total	--	µg	0.437	0.443	0.189	< 0.1
Analysis #2, Total	--	µg	0.443	0.443	0.192	< 0.1
Front Half Net Mass Hg, Average	MHg _{fthm}	µg	0.440	0.443	0.191	< 0.1

Back Half

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blanks
10% H ₂ O ₂ / 5% HNO ₃						
Analysis #1, Total µg	--	µg	0.813	1.10	0.892	< 0.2
Analysis #2, Total µg	--	µg	0.863	1.09	0.837	< 0.2
Net Mass Average	MHg _{bh2}	µg	0.838	1.10	0.865	< 0.2

Empty Impinger

Analysis #1, Total µg	--	µg	< 0.20	-*	< 0.2	< 0.2
Analysis #2, Total µg	--	µg	< 0.20	-*	< 0.2	< 0.2
Net Mass Average	MHg _{bh3A}	µg	< 0.20	0*	< 0.2	< 0.2

KMnO₄

Analysis #1, Total µg	--	µg	0.521	0.710	0.708	< 0.5
Analysis #2, Total µg	--	µg	0.564	0.698	0.723	< 0.5
Net Mass Average	MHg _{bh3B}	µg	0.543	0.704	0.716	< 0.5

HCl

Analysis #1, Total	--	µg	3.67	4.03	4.11	< 0.4
Analysis #2, Total	--	µg	3.73	4.02	4.13	< 0.4
Net Mass Average	MHg _{bh3C}	µg	3.70	4.03	4.12	< 0.4

Total Back Half Net Mass Hg, Average MHg _{bhm} = M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C})	MHg _{bhm}	µg	5.28	5.82	5.90	
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Blank Correction Determination

Back Half Blank MHg _{bhb} = M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C}) _{blanks}	MHg _{bhb}	µg	0.00			
			5% of the Total Net Mass			
	--	µg	0.29	0.31	0.30	MHg _{fthb} +MHg _{bhb} 0.10
Total Blank Correction Amount ⁽¹⁾	MHg _{blank}	µg	0.00	0.00	0.00	

Mercury Mass Determinations

Front Half (Filterable) Mercury Mass MHg _{ft} = MHg _{fthm} - MHg _{fthb}	MHg _{ft}	µg	0.44	0.44	0.19	
Back Half Mercury Mass MHg _{bh} = MHg _{bhm} - MHg _{bhb}	MHg _{bh}	µg	5.28	5.82	5.90	
Final Total Mercury Mass⁽²⁾ MHg _t = (MHg _{fthm} + MHg _{bhm}) - MHg _{blank}	MHg _t	µg	5.72	6.27	6.09	

Note: The "<" sign indicates the mass is below method detection limits. All calculations forward use the detection limit for concentration and emission determinations and no blank correction is made.

(1) If the total of the measured blank values (MHg_{fthb}+MHg_{bhb}) is in the range of 0.0 to 0.6µg then use the total; if it exceeds 0.6µg, use the greater of (I) or (II). (I) 0.6µg (II) the lesser of (a) (MHg_{fthb}+MHg_{bhb}) or (b) 5% of the sample value.

(2) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the total mercury mass may not necessarily be equal to (MHg_{ft}+MHg_{bh}).

* Sample was added to HNO₃/H₂O₂ impingers inadvertently

Determination of Metals Emissions
EPA Method 29

Line 4 Waste Gas Stack (SV118)

Input Data	Symbol	Units	Run 1	Run 2	Run 3					
Test Date	-	-	5/8/2015	5/8/2015	5/8/2015					
Test Period	-	-	757 - 1006	1038 - 1250	1318 - 1530					
Run Time	Θ	min	120	120	120					
Oxygen Concentration, % dry	O ₂ %	%	17.30	17.20	17.30					
Dry Volumetric Flowrate at Standard Conditions	Qd	dscfm	433,798	433,997	433,900					
Meter Volume at Standard Conditions	Vmstd	cubic feet	82.25	83.07	82.92					
Sample Loadings (From Lab Results)										
			Front Half	Back Half	Front Half	Back Half	Front Half	Back Half		
Lead	M _{FH} M _{BH}	µg	43.320	0.447	61.420	0.325	64.020	0.437		
Mercury ⁽¹⁾	MHg _{FH} MHg _{BH}	µg	0.440	5.281	0.443	5.824	0.191	5.900		
Total Mercury ⁽²⁾	MHg _t	µg	5.721		6.267		6.091			
Calculated Data										
Symbol			Units		Run 1		Run 2		Run 3	
Metals Concentrations: $C = (M_{FH} + M_{BH}) / (Vmstd)$										
Lead	C _(Pb)	µg/dscf	0.5321		0.7433		0.7773			
Mercury Concentration: $C = MHg / (Vmstd)$										
Front Half (Filterable) Mercury	C _(HgFH)	µg/dscf	0.0053		0.0053		0.0023			
Back Half Mercury	C _(HgBH)	µg/dscf	0.0642		0.0701		0.0712			
Total Mercury Concentration	C _(Hg)	µg/dscf	0.0696		0.0754		0.0734			
Metals Concentrations: $C = ug/dscf \times 35.315$										
Total Mercury Concentration	C _(Hg)	µg/dscm	2.456		2.664		2.594			
Metals Emission Rates: $E = (M_{FH} + M_{BH}) \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^3 \times Qd \times 60$										
Lead	E _(Pb)	lb/hr	0.031		0.043		0.045			
Mercury Emission Rates: $E = MHg \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^3 \times Qd \times 60$										
Front Half (Filterable) Mercury	E _(HgFH)	lb/hr	0.00031		0.00031		0.00013			
Back Half Mercury	E _(HgBH)	lb/hr	0.0037		0.0040		0.0041			
Total Mercury	E _(Hg)	lb/hr	0.0040		0.0043		0.0042			

(1) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the Total Mercury Mass may not necessarily be equal to (MHgfh+MHgbh).

(2) Calculated per EPA Method 29

Determination of Volumetric Air Flow Rate, Gas Composition, Moisture Content, Sample Volume and Isokinetics

EPA Methods 2, 3, 4, and 29
Line 6 Waste Gas Stack (SV144)

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test Date	-	-	5/21/2015	5/21/2015	5/21/2015
Test Period	-	-	815 - 1236	1316 - 1534	1613 - 1826
Number of Sample Ports	-	-	4	4	4
Number of Traverse Points	-	-	24	24	24
Duct Dimensions (diameter or Length x Width)	D, L X W	inches	192.00	192.00	192.00
Barometric Pressure	Pbar	in. Hg	28.22	28.22	28.22
Stack Static Pressure	Pg	in. H ₂ O	-0.35	-0.35	-0.35
Average Stack Temperature	Tsf	degrees F	111	111	111
Actual Dry Gas Meter Volume	Vm	cubic feet	83.96	88.00	85.64
Dry Gas Meter Calibration Factor	Y	-	0.9982	0.9982	0.9982
Average Orifice Meter Pressure Drop	DH	in H ₂ O	1.62	1.73	1.63
Average Meter Temperature	Tmf	degrees F	96	102	100
Pitot Tube Coefficient	Cp	-	0.84	0.84	0.84
Average Square Root of Velocity Head	(DP) ^{0.5}	-	0.624	0.645	0.629
Volume of Water Vapor Condensed in Impingers	Vwc	ml	163	168	169
Mass of Water Vapor Collected in Desiccant	Vwsg	g	19	23	19
Orsat Results, Dry Basis					
Oxygen	%O ₂	%v/v	17.6	17.6	17.8
Carbon Dioxide	%CO ₂	%v/v	2.40	2.40	2.50
Nitrogen + Carbon Monoxide	%N ₂ + %CO	%v/v	80.0	80.0	79.7
Nozzle Diameter	Dn	inches	0.255	0.255	0.255
Run Time	theta	minutes	120	120	120
Calculated Data	Symbol	Units	Run 1	Run 2	Run 3
Average Absolute Stack Temperature Tsr = Tsf + 460	Tsr	degrees R	571	571	571
Stack Pressure Ps = Pbar + Pg / 13.6	Ps	in. Hg	28.19	28.19	28.19
Duct Area A = 3.14 x D ² / (4 x 144) or A = L x W / 144	A	Sq. ft	201.062	201.062	201.062
Meter Volume at Standard Conditions Vmstd = 17.64 x Vm x Y x ((Pbar + (DH / 13.6)) / (Tmf + 460))	Vmstd	cubic feet	75.36	78.19	76.37
Average Moisture Content of Stack Gas MC = ((0.04707 x Vwc + 0.04715 x Vwsg) / ((0.04707 x Vwc + 0.04715 x Vwsg) + (Vmstd)) x 100	MC	% Vol	9.48	9.54	9.49
			see note	see note	see note
Molecular Weight of Stack Gas, dry Md = (0.44 x %CO ₂) + (0.32 x %O ₂) + (0.28 x (%N ₂ + %CO))	Md	lb/lbmol	29.09	29.09	29.11
Molecular Weight of Stack Gas, wet Ms = Md x (1 - (MC/100)) + 18 x (MC/100)	Ms	lb/lbmol	28.04	28.03	28.06
Average Stack Gas Velocity Vs = 85.49 x Cp x (dP) ^{0.5} x ((Tsr/(Ps x Ms)) ^{0.5})	Vs	ft/sec	38.09	39.40	38.37
Actual Volumetric Air Flow Rate Qa = 60 x Vs x A	Qa	acfm	459,535	475,357	462,885
Volumetric Air Flow Rate at Standard Conditions Qs = Qa x (528 / (Ts + 460)) x (Ps / 29.92)	Qs	scfm	400,332	413,935	403,221
Dry Volumetric Air Flow Rate at Standard Conditions Qd = Qa x (1 - (MC / 100)) x (528 / Tsr) x (Ps / 29.92)	Qd	dscfm	362,399	374,430	364,968
Nozzle Cross-Sectional Area An = (3.14 x Dn ²) / (4 x 144)	An	sq. ft	0.000355	0.000355	0.000355
Isokinetic Variation I = (0.0945 x Tsr x Vmstd) / (Ps x Vs x An x theta x (1 - (MC / 100)))	I	%	98.3	98.7	98.9

Note: Moisture Content limited to moisture at saturation

Results of the Method 29 Metals Analysis

Line 6 Waste Gas Stack (SV144)

Front Half (Filterable), µg

QA / QC Results

Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	0.623	31.7	29.0

Sample Results

Run 1	Average Run 2 and Run 2 Dup.	Run 3
29.8	30.35	28.5

Blank Corrected Results^{(1),(2)}

Run 1	Run 2	Run 3
29.18	29.73	27.88

Back Half, µg

QA / QC Results

Compound	Blank	Run 2	Run 2 Dup. Analysis
Lead	< 0.1	0.349	0.357

Sample Results

Run 1	Average Run 2 and Run 2 Dup.	Run 3
0.297	0.353	0.309

Blank Corrected Results^{(1),(2)}

Run 1	Run 2	Run 3
0.297	0.353	0.309

(1) Italics represent blank corrected values limited to zero

(2) If blank result is less than the detection limit, zero is used to calculate the blank corrected result

U. S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
July 1, 2015

Laboratory Results Summary of EPA Method 29 Mercury Analysis
From Sub-Contracted Mercury Analysis
Line 6 Waste Gas Stack (SV144)

Method 29 Mercury Mass Determination

Front Half (Filterable)

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blank (MHg _{fthb})
Analysis #1, Total	--	µg	0.299	0.366	0.261	< 0.1
Analysis #2, Total	--	µg	0.301	0.362	0.263	< 0.1
Front Half Net Mass Hg, Average	MHg _{fthm}	µg	0.300	0.364	0.262	< 0.1

Back Half

Inputs	Symbol	Units	Run 1	Run 2	Run 3	Blanks
10% H ₂ O ₂ / 5% HNO ₃						
Analysis #1, Total µg	--	µg	1.24	1.65	1.71	< 0.2
Analysis #2, Total µg	--	µg	1.25	1.55	1.72	< 0.2
Net Mass Average	MHg _{bh2}	µg	1.25	1.60	1.72	< 0.2
Empty Impinger						
Analysis #1, Total µg	--	µg	< 0.2	< 0.2	< 0.2	< 0.2
Analysis #2, Total µg	--	µg	< 0.2	< 0.2	< 0.2	< 0.2
Net Mass Average	MHg _{bh3A}	µg	< 0.2	< 0.2	< 0.2	< 0.2
KMnO ₄						
Analysis #1, Total µg	--	µg	< 0.5	0.703	2.50	< 0.5
Analysis #2, Total µg	--	µg	< 0.5	0.694	2.48	< 0.5
Net Mass Average	MHg _{bh3B}	µg	< 0.5	0.699	2.49	< 0.5
HCl						
Analysis #1, Total	--	µg	4.64	4.67	3.84	< 0.4
Analysis #2, Total	--	µg	4.71	4.72	3.84	< 0.4
Net Mass Average	MHg _{bh3C}	µg	4.68	4.70	3.84	< 0.4

Total Back Half Net Mass Hg, Average MHg _{bhm} = M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C})	MHg _{bhm}	µg	6.62	7.19	8.25	
--	--------------------	----	------	------	------	--

Blank Correction Determination

Back Half Blank MHg _{bhb} = M(Hg _{bh2} +Hg _{bh3A} +Hg _{bh3B} +Hg _{bh3C})/blanks	MHg _{bhb}	µg	0.00			
			5% of the Total Net Mass			MHg _{fthb} +MHg _{bhb}
	--	µg	0.35	0.38	0.43	0.10
Total Blank Correction Amount ⁽¹⁾	MHg _{blank}	µg	0.00	0.00	0.00	

Mercury Mass Determinations

Front Half (Filterable) Mercury Mass MHg _{ft} = MHg _{fthm} - MHg _{fthb}	MHg _{ft}	µg	0.30	0.36	0.26	
Back Half Mercury Mass MHg _{bh} = MHg _{bhm} - MHg _{bhb}	MHg _{bh}	µg	6.62	7.19	8.25	
Final Total Mercury Mass⁽²⁾ MHg _t = (MHg _{fthm} + MHg _{bhm}) - MHg _{blank}	MHg _t	µg	6.92	7.56	8.51	

Note: The "<" sign indicates the mass is below method detection limits. All calculations forward use the detection limit for concentration and emission determinations and no blank correction is made.

(1) If the total of the measured blank values (MHg_{fthb}+MHg_{bhb}) is in the range of 0.0 to 0.6µg then use the total; if it exceeds 0.6µg, use the greater of (I) or (II). (I) 0.6µg (II) the lesser of (a) (MHg_{fthb}+MHg_{bhb}) or (b) 5% of the sample value.

(2) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the total mercury mass may not necessarily be equal to (MHg_{fth}+MHg_{bh}).

Determination of Metals Emissions
EPA Method 29

Line 6 Waste Gas Stack (SV144)

Input Data	Symbol	Units	Run 1	Run 2	Run 3			
Test Date	-	-	5/21/2015	5/21/2015	5/21/2015			
Test Period	-	-	815 - 1236	1316 - 1534	1613 - 1826			
Run Time	Θ	min	120	120	120			
Oxygen Concentration, % dry	O ₂ %	%	17.60	17.60	17.80			
Dry Volumetric Flowrate at Standard Conditions	Qd	dscfm	362,399	374,430	364,968			
Meter Volume at Standard Conditions	Vmstd	cubic feet	75.36	78.19	76.37			
Sample Loadings (From Lab Results)								
			Front Half	Back Half	Front Half	Back Half	Front Half	Back Half
Lead	M _{FH} M _{BH}	μg	29.177	0.297	29.727	0.353	27.877	0.309
Mercury ⁽¹⁾	MHg _{fh} MHg _{bh}	μg	0.300	6.620	0.364	7.194	0.262	8.245
Total Mercury ⁽²⁾	MHg _t	μg	6.920		7.558		8.507	
Calculated Data								
	Symbol	Units	Run 1	Run 2	Run 3			
Metals Concentrations: $C = (M_{FH} + M_{BH}) / (Vmstd)$								
Lead	C _(Pb)	μg/dscf	0.3911	0.3847	0.3691			
Mercury Concentration: $C = MHg / (Vmstd)$								
Front Half (Filterable) Mercury	C _(HgFH)	μg/dscf	0.0040	0.0047	0.0034			
Back Half Mercury	C _(HgBH)	μg/dscf	0.0878	0.0920	0.1080			
Total Mercury Concentration	C _(Hg)	μg/dscf	0.0918	0.0967	0.1114			
Metals Concentrations: $C = ug/dscf \times 35.315$								
Total Mercury Concentration	C _(Hg)	μg/dscm	3.243	3.413	3.934			
Metals Emission Rates: $E = (M_{FH} + M_{BH}) \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^{-3} \times Qd \times 60$								
Lead	E _(Pb)	lb/hr	0.019	0.019	0.018			
Mercury Emission Rates: $E = MHg \times 2.2046 \times 10^{-9} \text{ lb/} \mu\text{g} / Vmstd\text{-ft}^{-3} \times Qd \times 60$								
Front Half (Filterable) Mercury	E _(HgFH)	lb/hr	0.000191	0.000231	0.000166			
Back Half Mercury	E _(HgBH)	lb/hr	0.004211	0.004557	0.005212			
Total Mercury	E _(Hg)	lb/hr	0.004402	0.004787	0.005378			

(1) EPA Method 29 does not include calculations and/or specifications for blank correcting the front half and back half Hg mass independently, therefore the Total Mercury Mass may not necessarily be equal to (MHgfh+MHgbh).

(2) Calculated per EPA Method 29

Appendix B

Field Data Sheets



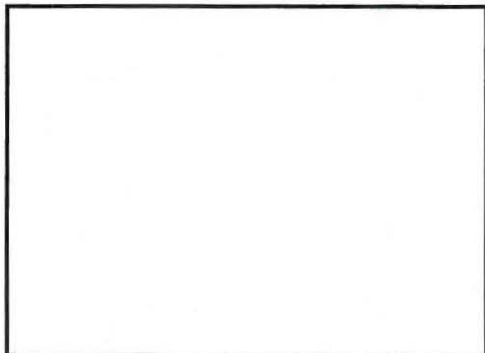
EPA METHOD 2 FIELD DATA SHEET

Project Minn. 12
Sample Location L3WYS 5V103
Date 5-6-15
Operators DJL/RBS/TAK
Duct Dimensions 125 inches
Port Length 7 inches
Pitot Tube No. 4-4 Cp 0.84
Manometer ID C-9 Bar. ID BA23
Digital Therm ID C-9 T.C. ID 4-4

	Run 1	Run 2	Run 3	Run 4
Bar Press (In Hg)				
Stat. Press (In H ₂ O)				
Temp - Dry Bulb °F				
Temp - Wet Bulb °F				
Moist Content - %				
O ₂ %				
Time of Meas.				

Pitot Leak Check Positive: OK Negative: OK

Traverse Point Information			Cyclonic Flow ∠°	Velocity Head - Inches H ₂ O				Stack Temperature - °F			
Point Number	Inches From:			Run 1 ΔP	Run 2 ΔP	Run 3 ΔP	Run 4 ΔP	Run 1 Temp.	Run 2 Temp.	Run 3 Temp.	Run 4 Temp.
A- 1	2.66	9.66									
2	8.37	15.37									
3	14.76	21.76									
4	22.16	29.16									
5	31.25	38.25									
6	44.46	51.46									
A - 1											
2											
3											
4											
5											
6											
C- 1											
2											
3											
4											
5											
6											
D- 1											
2											
3											
4											
5											
6											



Schematic of Duct Cross-Section

	Run 1	Run 2	Run 3	Run 4
Stack Pres. - In Hg				
Duct Area - Sq Ft.				
Mole Weight - Md				
Mole Weight - Ms				
Avg. Temp. - °F				
Average $\sqrt{\Delta P}$				
Gas Vel - Ft/Sec				
ACFM				
SCFM				
DSCFM				



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 1

Project	U. S. Steel Corporation	Meter ID	C-2	Probe ID	5-3	Bar.Press.	28.32	in. Hg	Sample Train Leak Rate, cfm:
Sample Location	L3 WGS SV103	Meter Y	1.0007	Pitot Tube No.	5-3	Stat Press.	-0.4	in. H2O	Pretest 0.000 at 10 in. Hg
Date	05/06/15	Orifice dH@	1.8568	Pitot Cp	0.84				Posttest 0.000 at 10 in. Hg
Test	2	Run #	1	Liner Type:	Glass				Pretest Pitot leak Check Pos Pass @ >3" w.c
Operators	DJK/RBS								Posttest Pitot leak Check Neg Pass @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1616	925.75												
1	5.0	930.19	0.850	2.63	4.58	930.33	*	131	*	*	*	71	71	13.0
2	10.0	935.12	1.000	3.10	4.97	935.30	*	131	*	*	*	69	70	13.0
3	15.0	940.36	1.150	3.55	5.32	940.62	*	131	*	*	*	70	69	13.0
4	20.0	945.88	1.300	4.02	5.65	946.27	*	131	*	*	*	73	70	13.0
5	25.0	951.30	1.200	3.73	5.46	951.73	*	130	*	*	*	76	71	13.0
6	30.0	956.45	1.100	3.43	5.24	956.97	*	131	*	*	*	77	72	13.0
7	35.0	961.01	0.800	2.50	4.48	961.45	*	130	*	*	*	77	72	13.0
8	40.0	964.83	0.810	2.53	4.51	965.96	*	130	*	*	*	74	72	13.0
9	45.0	969.41	0.870	2.71	4.66	970.61	*	131	*	*	*	72	72	13.0
10	50.0	973.97	0.900	2.79	4.73	975.34	*	131	*	*	*	73	72	13.0
11	55.0	979.00	0.930	2.89	4.81	980.15	*	131	*	*	*	74	72	13.0
12	60.0	983.91	0.880	2.73	4.68	984.83	*	132	*	*	*	75	72	13.0
13	65.0	988.00	0.670	2.09	4.09	988.92	*	131	*	*	*	75	72	13.0
14	70.0	992.07	0.630	1.97	3.97	992.89	*	130	*	*	*	77	72	13.0
15	75.0	996.02	0.630	1.97	3.97	996.86	*	131	*	*	*	78	73	13.0
16	80.0	1000.22	0.700	2.19	4.20	1001.06	*	130	*	*	*	79	73	13.0
17	85.0	1004.44	0.730	2.28	4.29	1005.35	*	131	*	*	*	79	74	13.0
18	90.0	1008.73	0.710	2.22	4.23	1009.58	*	131	*	*	*	80	74	13.0
19	95.0	1013.30	0.880	2.76	4.72	1014.30	*	131	*	*	*	79	74	13.0
20	100.0	1018.20	1.000	3.13	5.02	1019.32	*	132	*	*	*	80	75	13.0
21	105.0	1023.42	1.050	3.29	5.16	1024.48	*	131	*	*	*	80	75	13.0
22	110.0	1028.61	1.100	3.46	5.28	1029.76	*	130	*	*	*	80	75	13.0
23	115.0	1033.71	1.000	3.14	5.03	1034.79	*	131	*	*	*	79	75	13.0
24	120.0	1038.63	0.820	2.57	4.55	1039.35	*	131	*	*	*	79	75	13.0
End Time	2022													
Run Time	120		Avg DH=	2.82			Avg Ts=	130.83				Avg Tm=	74.33	

Integrated Gas Sampling Data :

Bag No.	1	Filter No.	4Q0476
Bag Vol.	15 liters	Nozzle No.	Glass
Leak Rate	0 cc/min	Nozzle Dn.	0.250

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	900.4	887.5	805.3	692.4	768.0	775.7	947.5	
Initial wt., g	665.4	771.1	770.7	684.7	765.7	776.0	921.8	
Difference	235	116.4	34.6	7.7	2.3	-0.3	25.7	421.4

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 2

Project	U. S. Steel Corporation	Meter ID	C-2	Probe ID	5-3	Bar.Press.	28.04	in. Hg	Sample Train Leak Rate, cfm:
Sample Location	L3 WGS SV103	Meter Y	1.0007	Pitot Tube No.	5-3	Stat Press.	-0.4	in. H2O	Pretest 0.000 at 10 in. Hg
Date	05/07/15	Orifice dH@	1.8568	Pitot Cp	0.84				Posttest 0.000 at 17 in. Hg
Test	2	Run #	2	Liner Type:	Glass				Pretest Pitot leak Check Pos Pass @ >3" w.c
Operators	DJK /RBS								Posttest Pitot leak Check Neg Pass @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	0807	39.06												
1	5.0	43.40	0.880	2.55	4.52	43.58	*	130	*	*	*	69	68	16.3
2	10.0	47.81	0.920	2.67	4.63	48.20	*	130	*	*	*	70	69	16.3
3	15.0	52.74	1.050	3.05	4.95	53.16	*	130	*	*	*	72	68	16.3
4	20.0	57.92	1.100	3.19	5.06	58.22	*	132	*	*	*	74	69	16.3
5	25.0	62.66	0.990	2.88	4.82	63.04	*	132	*	*	*	75	70	16.3
6	30.0	67.41	0.940	2.74	4.70	67.74	*	132	*	*	*	76	71	16.3
7	35.0	71.37	0.710	2.07	4.10	71.84	*	131	*	*	*	76	72	16.3
8	40.0	75.28	0.640	1.87	3.89	75.73	*	131	*	*	*	77	71	16.3
9	45.0	79.15	0.670	1.96	3.99	79.72	*	130	*	*	*	77	72	16.3
10	50.0	83.20	0.700	2.05	4.08	83.80	*	130	*	*	*	79	73	16.3
11	55.0	87.12	0.700	2.05	4.09	87.89	*	131	*	*	*	79	74	16.3
12	60.0	91.46	0.720	2.11	4.15	92.04	*	132	*	*	*	79	74	16.3
13	65.0	95.81	0.820	2.41	4.43	96.46	*	131	*	*	*	78	75	16.3
14	70.0	100.17	0.780	2.29	4.32	100.78	*	132	*	*	*	79	75	16.3
15	75.0	104.64	0.830	2.44	4.46	105.24	*	132	*	*	*	79	75	16.3
16	80.0	109.15	0.900	2.64	4.64	109.87	*	133	*	*	*	80	76	16.3
17	85.0	113.86	0.950	2.79	4.78	114.65	*	132	*	*	*	81	76	16.3
18	90.0	118.43	0.820	2.42	4.45	119.10	*	131	*	*	*	81	76	16.3
19	95.0	123.30	0.980	2.90	4.86	123.96	*	130	*	*	*	78	79	16.3
20	100.0	128.28	1.050	3.10	5.03	128.99	*	130	*	*	*	81	78	16.3
21	105.0	133.31	1.150	3.39	5.27	134.26	*	132	*	*	*	81	78	16.3
22	110.0	138.77	1.250	3.69	5.49	139.76	*	132	*	*	*	82	78	16.3
23	115.0	144.07	1.150	3.40	5.28	145.04	*	131	*	*	*	82	78	16.3
24	120.0	148.81	0.770	2.28	4.32	149.36	*	131	*	*	*	81	78	16.3
End Time	1022													
Run Time	120		Avg DH=	2.62			Avg Ts=	131.17				Avg Tm=	75.81	

Integrated Gas Sampling Data :

Bag No.	2	Filter No.	4Q0477
Bag Vol.	15 liters	Nozzle No.	Glass
Leak Rate	0 cc/min	Nozzle Dn.	0.250

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	918.6	863.0	787.8	661.2	771.0	766.2	947.6	
Initial wt., g	653.5	766.6	767.6	657.0	770.5	766.7	920.9	
Difference	265.1	96.4	20.2	4.2	0.5	-0.5	26.7	412.6

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 3

Project	U. S. Steel Corporation	Meter ID	C-2	Probe ID	5-3	Bar.Press.	28.04	in. Hg	Sample Train Leak	Rate, cfm:
Sample Location	L3 WGS SV103	Meter Y	1.0007	Pitot Tube No.	5-3	Stat Press.	-0.4	in. H2O	Pretest	0.000 at 10 in. Hg
Date	05/07/15	Orifice dH@	1.8568	Pitot Cp	0.84				Posttest	0.000 at 13 in. Hg
Test	2	Run #	3	Liner Type:	Glass				Pretest Pitot leak Check Pos	PASS @ >3" w.c
Operators	DJK /RBS								Posttest Pitot leak Check Neg	PASS @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1054													
1	5.0	153.90	0.940	2.75	4.74	153.85	*	131	*	*	*	78	78	16.6
2	10.0	158.98	1.100	3.23	5.13	158.98	*	130	*	*	*	78	78	16.6
3	15.0	164.11	1.150	3.36	5.24	164.22	*	132	*	*	*	80	78	16.6
4	20.0	169.45	1.250	3.67	5.48	169.70	*	131	*	*	*	81	78	16.6
5	25.0	174.77	1.150	3.37	5.25	174.95	*	132	*	*	*	82	78	16.6
6	30.0	179.95	0.930	2.73	4.73	179.69	*	131	*	*	*	82	78	16.6
7	35.0	184.40	0.820	2.41	4.45	184.14	*	130	*	*	*	81	79	16.6
8	40.0	188.60	0.810	2.39	4.42	188.56	*	130	*	*	*	75	75	16.6
9	45.0	193.01	0.820	2.38	4.40	192.96	*	132	*	*	*	78	78	16.6
10	50.0	197.35	0.900	2.62	4.63	197.58	*	134	*	*	*	79	78	16.6
11	55.0	201.97	0.860	2.52	4.54	202.12	*	132	*	*	*	79	77	16.6
12	60.0	206.83	0.840	2.46	4.48	206.60	*	132	*	*	*	77	77	16.6
13	65.0	211.01	0.700	2.04	4.08	210.68	*	132	*	*	*	78	76	16.6
14	70.0	214.65	0.610	1.78	3.81	214.48	*	132	*	*	*	77	76	16.6
15	75.0	218.53	0.620	1.81	3.84	218.32	*	132	*	*	*	78	76	16.6
16	80.0	222.25	0.670	1.95	3.99	222.31	*	133	*	*	*	79	76	16.6
17	85.0	226.08	0.680	1.99	4.03	226.33	*	132	*	*	*	79	76	16.6
18	90.0	229.86	0.640	1.87	3.90	230.24	*	133	*	*	*	79	76	16.6
19	95.0	234.30	0.850	2.48	4.50	234.73	*	133	*	*	*	79	76	16.6
20	100.0	238.67	0.870	2.55	4.56	239.29	*	131	*	*	*	79	76	16.6
21	105.0	243.61	1.000	2.92	4.88	244.17	*	132	*	*	*	79	76	16.6
22	110.0	248.60	1.050	3.07	5.01	249.18	*	131	*	*	*	79	76	16.6
23	115.0	253.53	1.000	2.93	4.89	254.06	*	131	*	*	*	79	76	16.6
24	120.0	257.91	0.840	2.45	4.47	258.54	*	132	*	*	*	79	76	16.6
End Time	1413													
Run Time	120		Avg DH=	2.57			Avg Ts=	131.71				Avg Tm=	77.88	

Integrated Gas Sampling Data :

Bag No.	2	Filter No.	4Q0478
Bag Vol.	15 liters	Nozzle No.	Glass
Leak Rate	0 cc/min	Nozzle Dn.	0.250

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	925.2	871.0	791.0	693.7	770.2	781.0	942.6	
Initial wt., g	665.9	769.9	770.4	689.1	771.2	781.4	924.7	
Difference	259.3	101.1	20.6	4.6	-1	-0.4	17.9	402.1

* Data Recorded on Field Data Sheet

BARR

EPA METHOD 5/202
FIELD DATA SHEET

Project M. 2012 Meter ID C-2
 Smp Loc L3 WGS SUIOS Meter Y 1.0007
 Test No. 2 Runs 1-2 Orifice H@ 1.8568
 Date 5-6-7-15 Operator DSE/RBS/TAK

Probe ID 5-4-5-3 Bar. Pres 28.32 in Hg CPM TC NA
 Pitot ID 5-4-5-3 Stat. Pres 28.41 in Hg Imp TC NA
 Pitot Cp 0.84 Probe Length 5 ft
 Liner Type ☒ Glass ☐ S.S. ☐ Other

Sample Train Leak Rate (cfm)			
Run # 1		Run # 2	
Pretest 0.0 at 10 in Hg		Pretest 0.0 at 10 in Hg	
Posttest 0.0 at 10 in Hg		Posttest 0.0 at 17 in Hg	
Pitot (3 in.) Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>		Pitot (3 in.) Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>	

TEST RUN 3														TEST RUN 4													
Sample Point	Sample Time ΔT	Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F	Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F				
							Probe	Filter	CPM Filter	Impinger Outlet								Probe	Filter	CPM Filter	Impinger Outlet						
		925.45							NP											NP							
A-6	5	930.19	0.88	2.63	5.0	131	247	250		64	71	71	93.40	0.88	2.55	7.5	130	251	250		61	69	68				
	5	930.12	1.00	3.10	5.0	131	249	251		62	69	70	92.81	0.92	2.67	8.0	130	250	250		59	70	69				
	4	940.36	1.15	3.55	5.5	131	246	249		62	70	69	92.74	1.05	2.88	9.5	130	242	251		59	72	68				
	3	948.88	1.30	4.02	6.5	131	246	242		62	73	70	92.92	1.10	3.19	10.0	132	242	250		61	74	69				
	2	951.30	1.20	3.73	6.5	130	251	249		64	76	71	92.66	0.99	2.88	10.0	132	249	251		64	75	70				
	1	956.95	1.10	3.42	6.0	131	250	249		65	77	72	92.41	0.94	2.74	10.0	132	249	251		65	76	71				
B-6	25	961.01	0.80	2.50	5.0	130	245	249		65	77	72	91.37	0.71	2.07	7.0	131	241	242		60	76	72				
	5	964.43	0.81	2.58	5.0	130	250	251		60	74	72	91.28	0.64	1.82	7.0	131	251	252		56	77	71				
	4	969.4	0.87	2.71	5.0	131	241	245		54	72	72	91.15	0.67	1.96	7.0	130	251	252		56	77	72				
	3	972.92	0.90	2.79	5.5	131	246	250		62	73	72	91.20	0.70	2.05	7.0	130	251	254		57	79	73				
	2	979.20	0.93	2.89	5.5	131	249	248		65	74	72	91.46	0.70	2.05	7.0	131	250	254		52	79	74				
	1	983.91	0.88	2.79	5.5	132	249	251		62	75	72	91.46	0.72	2.07	7.0	132	251	251		57	79	74				
C-6	65	988.20	0.67	2.09	5.0	131	255	251		65	75	72	91.81	0.82	2.41	8.5	131	250	251		56	78	75				
	5	992.07	0.63	1.97	5.0	130	256	251		62	77	72	100.17	0.78	2.29	8.5	132	248	249		56	79	75				
	4	996.02	0.63	1.97	5.0	131	252	257		61	78	73	101.64	0.83	2.44	9.0	132	251	249		59	79	75				
	3	1000.22	0.70	2.19	5.0	131	250	248		61	79	73	109.15	0.90	2.66	9.5	133	246	252		60	80	76				
	2	1004.44	0.73	2.28	5.0	131	249	249		61	79	74	113.86	0.95	2.79	10.0	132	249	249		62	81	76				
	1	1008.38	0.71	2.22	5.0	131	249	249		62	80	74	118.43	0.82	2.42	9.5	131	248	255		62	81	76				
D-6	75	1013.30	0.88	2.76	6.0	131	254	251		62	79	74	123.30	0.98	2.90	11.0	130	248	250		64	79	75				
	5	1018.20	1.00	3.13	7.0	132	252	251		61	80	75	128.28	1.05	3.10	11.5	130	249	251		64	81	78				
	4	1023.42	1.05	3.29	7.0	131	250	246		63	80	75	133.31	1.15	3.39	12.5	132	252	250		66	81	78				
	3	1028.61	1.10	3.46	7.0	130	250	249		63	80	75	138.77	1.25	3.69	14.0	132	250	248		65	82	78				
	2	1033.71	1.00	3.14	7.0	131	251	247		65	79	78	144.07	1.15	3.40	14.0	131	249	249		63	82	78				
	1	1038.63	0.82	2.57	7.0	131	250	248		65	79	75	148.81	0.77	2.28	11.0	131	250	248		63	81	78				
Σ=		10258	0.40	ΔP=0.82		T=30.8					Tm=71.3		109.75	0.84	ΔH=2.62		Ts=73.17					Tm=75.81					

Initialization Values			Test Run Times		ORSAT System		Sample Train Components			Air Flows	
Meter Temp	Oxygen Content	Moisture Content	Start Time	End Time	Bag No.	Bag Vol	cc/min at 15 in Hg	Filter No.	Nozzle No.	Nozzle Dn	
Run 1 70	18.8	13	1615	2022	1	152	0.0	400476	Chss	0.25	302546 ACFM
Run 2 68	16.8	16.3	1827	1222	2	152	0.0	400477	11	11	215483 DSCFM
											302548 ACFM
											212741 DSCFM

MOISTURE RECOVERY: RUN # 1					
Impinger	1	2	3	4	Total
Final wt., g					
Initial wt., g	0	0	100		
Difference					

MOISTURE RECOVERY: RUN # 2					
Impinger	1	2	3	4	Total
Final wt., g					
Initial wt., g	0	0	100		
Difference					

Nozzle Calibration	
Tech. <u>TAK</u>	Date <u>5-6-15</u>
Nozzle No.	
1	0.25
2	0.25
3	0.25
Avg. in.	0.25

Stop: 1657 Point e 1848
 see d.s. for moisture



EPA METHOD 5/202
FIELD DATA SHEET

Project Miner Inc
Smpl Loc CS WGS SU103
Test No. 2 Runs 123
Date 5-2-15 Operator DTX/RBS/TAK

Meter ID C-2
Meter Y 1.003
Orifice H@ 1.8568

Probe ID 5-4-5-3
Pitot ID 5-4-5-3
Pitot Cp 0.87

Bar. Pres 28.32 in Hg
Stat. Pres 28.41 in Hg

CPM TC NA
Imp TC

Probe Length 5 ft
Liner Type A Glass ☐ S.S. ☐ Other

Sample Train Leak Rate (cfm)			
Run 1		Run 2	
Pretest	at <u>10</u> in Hg	Pretest	at in Hg
Posttest	at <u>13</u> in Hg	Posttest	at in Hg
Pitot (3 in.)	Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>	Pitot (3 in.)	Pos. <input type="checkbox"/> Neg. <input type="checkbox"/>

TEST RUN 1														TEST RUN 2											
Sample Point	Sample Time ΔT	Meter Volume Vm, ft ³	Velocity ΔP , in H ₂ O	Orifice ΔH , in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F	Meter Volume Vm, ft ³	Velocity ΔP , in H ₂ O	Orifice ΔH , in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F		
							Probe	Filter	CPM Filter	Impinger Outlet								Probe	Filter	CPM Filter	Impinger Outlet				
		145.11																							
A-6	5	153.92	0.94	2.71	5.5	131	245	246		66	78	78													
	10	158.92	1.12	3.23	6.0	130	247	247		67	78	78													
	15	164.11	1.15	3.36	6.0	132	249	247		61	80	78													
	20	169.45	1.25	3.62	7.0	131	250	242		59	81	78													
	25	174.77	1.15	3.37	7.0	132	248	249		54	82	78													
	30	179.85	0.93	2.73	7.0	131	248	248		59	82	78													
B-6	35	184.43	0.82	2.41	5.5	130	250	251		61	81	79													
	40	188.64	0.81	2.38	5.0	130	241	240		61	75	75													
	45	193.01	0.82	2.38	5.0	132	246	248		60	78	75													
	50	193.35	0.90	2.62	5.5	134	247	249		62	79	78													
	55	201.97	0.86	2.59	5.5	132	249	249		63	79	77													
	60	206.83	0.84	2.46	6.0	132	248	249		64	77	77													
C-6	65	211.01	0.70	2.04	5.0	132	246	250		64	78	76													
	70	214.65	0.61	1.78	4.5	132	243	248		63	77	76													
	75	218.53	0.62	1.81	4.5	132	247	250		63	78	76													
	80	222.25	0.67	1.91	5.0	137	246	248		64	79	76													
	85	226.98	0.68	1.99	5.0	132	252	249		66	79	76													
	90	229.88	0.64	1.87	5.0	133	250	249		64	79	76													
D-6	95	234.36	0.85	2.48	6.0	133	255	249		65	79	76													
	100	238.67	0.87	2.55	6.5	131	260	247		64	79	76													
	105	243.61	1.10	2.92	7.0	132	261	242		63	79	76													
	110	248.62	1.05	3.07	7.0	131	241	242		62	74	76													
	115	253.53	1.00	2.93	7.0	131	244	249		63	79	76													
	120	257.91	0.84	2.45	6.5	132	247	247		63	79	76													
	0=	148.80	0.85	$\Delta H=2.57$		$T_s=131.71$					$T_m=78.88$		Vm=		$\Delta H=$		$T_s=$					$T_m=$			

	Initialization Values			Test Run Times		ORSAT System			Sample Train Components			Air Flows	
	Meter Temp	Oxygen Content	Moisture Content	Start Time	End Time	Bag No.	Bag Vol	cc/min * at 15 in Hg	Filter No.	Nozzle No.	Nozzle Dn	ACFM	DSCFM
Run 1	78	16.8	16.6	1057	1413	3	152	0.2	460476	6.155	0.250	302.082	211.048
Run 2													

MOISTURE RECOVERY: RUN 1						
Impinger	1	2	3	4	Desiccant	Total
Final wt., g						
Initial wt., g	0	0	100			
Difference						

MOISTURE RECOVERY: RUN 2						
Impinger	1	2	3	4	Desiccant	Total
Final wt., g						
Initial wt., g	0	0	100			
Difference						

Nozzle Calibration	
Tech.	Date
Nozzle No.	C-655
1	
2	
3	
Avg. in.	0.250

Delay 1113-1158 due to reset
Delay 1218-1252 (pump problem) See d.s. for moisture
Bar.

Line 3 Wast Gas

5/6/15	Empty	HNO ₃	HNO ₃	Dry	kmno ₄	kmno ₄	D.C.
Temp	#1	#2	#3	#4	#5	#6	
END	900.4	887.5	805.3	692.4	768.0	775.7	947.5
START	<u>665.4</u>	<u>771.1</u>	<u>770.7</u>	<u>684.7</u>	<u>765.7</u>	<u>776.0</u>	<u>921.8</u>
							<u>776</u>

5/7/15 Run 2

	Empty	HNO ₃	HNO ₃	Dry	kmno ₄	kmno ₄	D.C.
END	918.6	863.0	787.8	661.2	771.0	766.2	947.6
START	653.5	766.6	767.6	657.0	770.5	766.7	920.9

5/7/15 Run 3

	Empty	HNO ₃	HNO ₃	Dry	kmno ₄	kmno ₄	D.C.
END	925.2	871	791	693.7	770.2	781.0	942.6
START	665.9	769.9	770.4	689.1	771.2	781.4	924.7

14.44
 20.54
 27.36
 35.25
 44.95
 59.05



Modified EPA METHOD 3A /10-- Instrument Analysis Data Sheet

Project Minn tac
Sample Location (S) L3WLS
Test No 1
Date 5-6, 7-15
Operators DK/RBS

Analyzer Make / Model / Serial No. Cy/California Analytical/200/411063
Analyzer O₂ Range (span), %: 0 - 22.47
Analyzer CO₂ Range (span), %: 0 - 9.98
Analyzer CO₂ Range (span), PPM:
CO Analyzer Make / Model / Serial No.
Analyzer O₂ Range (span), ppm:

	Cylinder			
	Serial No.	O ₂ Cert. Conc.	CO ₂ Cert. Conc.	CO Cert. Conc., PPM
Zero Gas	1010 X F 14	0	0	
O ₂ /CO ₂ Mid-range	CC 102877	10.02	9.98	
O ₂ /CO ₂ High-range	CC 99473	22.47	4.91	
CO Mid Range				
CO High Range				

PRETEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂		CO	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0.0	0	0.0		
Mid-range:	10.02	10.0	9.98	10.0		
High-range:	22.47	22.47	4.91	4.91		

Time of Calibration 2020 to 2040

INTEGRATED BAG ANALYSIS

Location/Test No.	<u>L3WLS / 1</u>								
Run No.	1	2	3	1	2	3	1	2	3
Time Sampled	1615-2021	806-2022	1057-1412						
Time Analyzed	240	245	245						
O ₂ , %	16.8	16.9	16.8						
CO ₂ , %	2.9	2.9	2.9						
CO, PPM	8	8	8						

POSTTEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂		CO	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0	0	0		
Mid-range:	10.02	9.97	9.98	9.98		
High-range:	22.47	22.49	4.91	4.90		



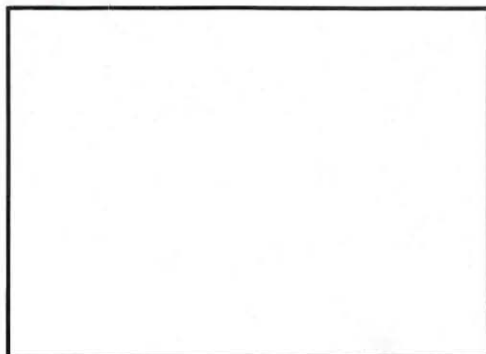
EPA METHOD 2 FIELD DATA SHEET

Project Minn fac
Sample Location LA W65 S118
Date 5-8-15
Operators DSH/RBS
Duct Dimensions 16.8 inches
Port Length 2.3 inches
Pitot Tube No. 7-3 Cp 0.84
Manometer ID C-9 Bar. ID BA 23
Digital Therm ID C-9 T.C. ID 7-3

	Run 1	Run 2	Run 3	Run 4
Bar Press (In Hg)	28.14			
Stat. Press (In H ₂ O)	-1.50			
Temp - Dry Bulb °F				
Temp - Wet Bulb °F				
Moist Content - %				
O ₂ %				
Time of Meas.				

Pitot Leak Check Positive: OK Negative: OK

Traverse Point Information			Cyclonic Flow ∠°	Velocity Head - Inches H ₂ O				Stack Temperature - °F			
Point	Inches From:			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3	Run 4
Number	Wall	Port		ΔP	ΔP	ΔP	ΔP	Temp.	Temp.	Temp.	Temp.
A-1	3.58	26.58									
2	11.25	34.25									
3	19.84	42.54									
4	24.78	52.78									
5	42.50	65.50									
6	59.75	82.75									
B-1											
2											
3											
4											
5											
6											
C-1											
2											
3											
4											
5											
6											
D-1											
2											
3											
4											
5											
6											



Schematic of Duct Cross-Section

	Run 1	Run 2	Run 3	Run 4
Stack Pres. - In Hg				
Duct Area - Sq Ft.				
Mole Weight - Md				
Mole Weight - Ms				
Avg. Temp. - °F				
Average $\sqrt{\Delta P}$				
Gas Vel - Ft/Sec				
ACFM				
SCFM				
DSCFM				



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 1

Project	U. S. Steel Corporation	Meter ID	C-9	Probe ID	7-3	Bar.Press.	28.14	in. Hg	Sample Train Leak Rate, cfm:
Sample Location	Line 4 Waste Gas Stack SV118	Meter Y	0.9959	Pitot Tube No.	7-3	Stat Press.	-1.0	in. H2O	Pretest 0.000 at 10 in. Hg
Date	05/08/15	Orifice dH@	1.9504	Pitot Cp	0.84				Posttest 0.000 at 8 in. Hg
Test	1	Run #	1	Liner Type:	Glass				Pretest Pitot leak Check Pos Pass @ >3" w.c
Operators	DJK/RBS								Posttest Pitot leak Check Neg Pass @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	0757	695.66												
1	5.0	699.52	1.200	2.05	3.87	699.53	*	119	*	*	*	49	49	13.0
2	10.0	703.35	1.150	1.96	3.78	703.30	*	120	*	*	*	55	55	13.0
3	15.0	707.20	1.200	2.05	3.88	707.19	*	126	*	*	*	55	55	13.0
4	20.0	711.11	1.250	2.14	3.97	711.15	*	125	*	*	*	56	54	13.0
5	25.0	715.04	1.300	2.23	4.05	715.20	*	124	*	*	*	58	55	13.0
6	30.0	718.82	1.100	1.88	3.73	718.93	*	126	*	*	*	59	55	13.0
7	35.0	722.20	0.870	1.49	3.32	722.25	*	125	*	*	*	59	56	13.0
8	40.0	725.52	0.920	1.59	3.43	725.69	*	120	*	*	*	56	52	13.0
9	45.0	729.01	0.980	1.69	3.52	729.21	*	119	*	*	*	57	53	13.0
10	50.0	732.31	0.880	1.51	3.33	732.54	*	123	*	*	*	59	54	13.0
11	55.0	735.66	0.930	1.61	3.45	735.99	*	120	*	*	*	60	55	13.0
12	60.0	739.00	0.870	1.51	3.34	739.33	*	120	*	*	*	60	55	13.0
13	65.0	742.15	0.780	1.35	3.16	742.49	*	119	*	*	*	61	57	13.0
14	70.0	745.12	0.810	1.41	3.23	745.72	*	120	*	*	*	62	58	13.0
15	75.0	748.17	0.790	1.38	3.20	748.92	*	120	*	*	*	62	58	13.0
16	80.0	751.38	0.840	1.46	3.29	752.22	*	121	*	*	*	62	58	13.0
17	85.0	754.61	0.810	1.41	3.23	755.45	*	122	*	*	*	62	58	13.0
18	90.0	757.80	0.700	1.21	3.00	758.45	*	124	*	*	*	63	59	13.0
19	95.0	761.60	1.100	1.92	3.78	762.23	*	120	*	*	*	61	58	13.0
20	100.0	766.48	1.100	1.91	3.77	766.00	*	120	*	*	*	61	59	13.0
21	105.0	769.00	1.250	2.18	4.03	770.02	*	119	*	*	*	62	59	13.0
22	110.0	773.11	1.300	2.27	4.11	774.13	*	119	*	*	*	62	59	13.0
23	115.0	777.30	1.350	2.36	4.19	778.32	*	119	*	*	*	62	59	13.0
24	120.0	781.41	1.200	2.10	3.95	782.27	*	119	*	*	*	62	59	13.0
End Time	1006													
Run Time	120		Avg DH=	1.78			Avg Ts=	121.21				Avg Tm=	57.79	

Integrated Gas Sampling Data :

Bag No.		Filter No.	4Q0480
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.214

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	830.2	814.0	776.7	689.6	765.7	777.0	918.4	
Initial wt., g	666.5	768.5	768.8	688.1	765.2	777.5	901.5	
Difference	163.7	45.5	7.9	1.5	0.5	-0.5	16.9	235.5

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 2

Project	U. S. Steel Corporation			Meter ID	C-9	Probe ID	7-3	Bar.Press.	28.14	in. Hg	Sample Train Leak Rate, cfm:			
Sample Location	Line 4 Waste Gas Stack SV118			Meter Y	0.9959	Pitot Tube No.	7-3	Stat Press.	-1.0	in. H2O	Pretest	0.000	at 10 in. Hg	
Date	05/08/15			Orifice dH@	1.9504	Pitot Cp	0.84				Posttest	0.000	at 11 in. Hg	
Test	1	Run #	2				Liner Type:	Glass				Pretest Pitot leak Check Pos	Pass	@ >3" w.c
Operators	DJK /RBS									Posttest Pitot leak Check Neg			Pass	@ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft ³	Velocity Head DP, in. H ₂ O	Orifice DH in. H ₂ O	Ideal Point Volume Vm, ft ³	Ideal Meter Vol Vm, ft ³	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1038	781.67												
1	5.0	785.30	1.100	1.95	3.79	785.46	*	119	*	*	*	58	59	11.9
2	10.0	789.15	1.100	1.95	3.80	789.26	*	121	*	*	*	58	58	11.9
3	15.0	793.15	1.400	2.48	4.29	793.55	*	119	*	*	*	59	58	11.9
4	20.0	797.20	1.350	2.40	4.22	797.77	*	119	*	*	*	60	58	11.9
5	25.0	801.26	1.250	2.22	4.06	801.83	*	119	*	*	*	62	59	11.9
6	30.0	805.29	1.250	2.23	4.07	805.90	*	119	*	*	*	63	59	11.9
7	35.0	808.67	0.910	1.62	3.47	809.37	*	120	*	*	*	62	59	11.9
8	40.0	812.13	0.930	1.65	3.50	812.88	*	122	*	*	*	64	59	11.9
9	45.0	815.58	0.950	1.69	3.54	816.42	*	123	*	*	*	65	60	11.9
10	50.0	818.95	0.750	1.34	3.16	819.58	*	122	*	*	*	65	60	11.9
11	55.0	822.31	0.790	1.41	3.24	822.82	*	122	*	*	*	65	60	11.9
12	60.0	825.15	0.630	1.12	2.89	825.72	*	122	*	*	*	65	61	11.9
13	65.0	828.17	0.860	1.54	3.39	829.11	*	119	*	*	*	64	61	11.9
14	70.0	831.30	0.830	1.49	3.33	832.44	*	119	*	*	*	65	61	11.9
15	75.0	834.70	0.810	1.44	3.28	835.72	*	124	*	*	*	66	61	11.9
16	80.0	837.99	0.850	1.51	3.36	839.08	*	124	*	*	*	66	61	11.9
17	85.0	841.38	0.900	1.61	3.48	842.56	*	119	*	*	*	66	62	11.9
18	90.0	844.77	0.870	1.55	3.41	845.97	*	122	*	*	*	67	62	11.9
19	95.0	848.55	1.000	1.80	3.67	849.64	*	119	*	*	*	65	62	11.9
20	100.0	852.50	1.200	2.14	4.00	853.64	*	122	*	*	*	66	62	11.9
21	105.0	856.65	1.250	2.24	4.10	857.74	*	119	*	*	*	67	63	11.9
22	110.0	860.82	1.300	2.34	4.19	861.93	*	119	*	*	*	67	63	11.9
23	115.0	865.01	1.250	2.25	4.11	866.04	*	119	*	*	*	67	64	11.9
24	120.0	869.03	1.250	2.25	4.11	870.15	*	120	*	*	*	67	64	11.9
End Time	1250													
Run Time	120		Avg DH=	1.84			Avg Ts=	120.50				Avg Tm=	62.40	

Integrated Gas Sampling Data :

Bag No.		Filter No.	4Q0481
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.214

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	827.7	811.4	778.4	661.6	775.9	776.4	941.0	
Initial wt., g	657.0	767.3	771.0	660.5	775.0	775.6	925.0	
Difference	170.7	44.1	7.4	1.1	0.9	0.8	16	241

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 3

Project	U. S. Steel Corporation			Meter ID	C-9	Probe ID	7-3	Bar.Press.	28.14	in. Hg	Sample Train Leak Rate, cfm:		
Sample Location	Line 4 Waste Gas Stack SV118			Meter Y	0.9959	Pitot Tube No.	7-3	Stat Press.	-1.0	in. H2O	Pretest	0.000	at 10 in. Hg
Date	05/08/15			Orifice dH@	1.9504	Pitot Cp	0.84				Posttest	0.000	at 13 in. Hg
Test	1	Run #	3				Liner Type:	Glass				Pretest Pitot leak Check Pos	PASS @ >3" w.c
Operators	DJK /RBS									Posttest Pitot leak Check Neg			PASS @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1318	869.30												
1	5.0	873.00	1.050	1.87	3.74	873.04	*	119	*	*	*	62	62	12.0
2	10.0	877.10	1.300	2.31	4.16	877.19	*	120	*	*	*	61	62	12.0
3	15.0	881.20	1.300	2.31	4.15	881.35	*	120	*	*	*	63	62	12.0
4	20.0	885.33	1.250	2.23	4.08	885.43	*	119	*	*	*	64	62	12.0
5	25.0	889.27	1.200	2.14	4.00	889.43	*	119	*	*	*	65	62	12.0
6	30.0	893.15	1.200	2.15	4.01	893.44	*	119	*	*	*	66	62	12.0
7	35.0	896.51	0.960	1.72	3.59	897.03	*	119	*	*	*	66	63	12.0
8	40.0	900.00	0.940	1.68	3.54	900.57	*	122	*	*	*	68	63	12.0
9	45.0	903.42	0.930	1.67	3.54	904.11	*	119	*	*	*	69	64	12.0
10	50.0	907.00	0.930	1.67	3.55	907.66	*	120	*	*	*	70	65	12.0
11	55.0	910.71	0.910	1.63	3.51	911.17	*	121	*	*	*	71	66	12.0
12	60.0	913.78	0.870	1.56	3.43	914.60	*	124	*	*	*	72	67	12.0
13	65.0	917.00	0.780	1.41	3.27	917.87	*	119	*	*	*	70	68	12.0
14	70.0	920.01	0.810	1.47	3.33	921.20	*	118	*	*	*	72	68	12.0
15	75.0	923.53	0.830	1.49	3.36	924.56	*	125	*	*	*	73	68	12.0
16	80.0	927.08	0.820	1.48	3.35	927.91	*	121	*	*	*	73	68	12.0
17	85.0	930.29	0.780	1.41	3.27	931.18	*	119	*	*	*	73	68	12.0
18	90.0	933.06	0.630	1.14	2.94	934.12	*	120	*	*	*	73	69	12.0
19	95.0	937.00	1.000	1.81	3.71	937.83	*	119	*	*	*	71	68	12.0
20	100.0	941.01	1.200	2.18	4.06	941.89	*	118	*	*	*	71	68	12.0
21	105.0	945.20	1.250	2.27	4.14	946.03	*	118	*	*	*	71	68	12.0
22	110.0	949.29	1.200	2.17	4.05	950.08	*	119	*	*	*	71	68	12.0
23	115.0	953.20	1.250	2.26	4.14	954.22	*	119	*	*	*	71	68	12.0
24	120.0	957.34	1.200	2.18	4.06	958.28	*	118	*	*	*	72	68	12.0
End Time	1530													
Run Time	120		Avg DH=	1.84			Avg Ts=	119.75				Avg Tm=	67.40	

Integrated Gas Sampling Data :

Bag No.		Filter No.	4Q0482
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.214

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	825.3	822.5	779.4	691.0	771.6	780.5	936.2	
Initial wt., g	668.0	772.1	770.9	689.7	771.3	781.0	918.4	
Difference	157.3	50.4	8.5	1.3	0.3	-0.5	17.8	235.1

* Data Recorded on Field Data Sheet



EPA METHOD 5/202 29 FIELD DATA SHEET

Project Monroe
Smp Loc C4W65 S0118
Date 5-8-15
Operator D3K, RAS

Test No 1
Runs 1-2
Pilot No 7-3
SM 2
CM C9

Meter y 09959
Bar. Pres 28.17 in Hg
Stat. Pres 21.00 in Hg
Probe Length 7 ft
Liner Type: ☒ Glass ☐ S. ☐ Other

ΔH @ 1.9504
Cp 0.84
P 7-3

CPM TC ---
Impngr TC ---

Sample Train Leak Rate (cfm)			
Run 1		Run 2	
Pretest	0.00 at 10 in Hg	Pretest	0.00 at 10 in Hg
Posttest	0.00 at 8 in Hg	Posttest	0.00 at 11.0 in Hg
Pitot (3 in.)	Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>	Pitot (3 in.)	Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>

TEST RUN 1														TEST RUN 2													
Sample Point	Sample Time ΔT	Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp. °F				Meter Inlet Temp. °F	Meter Outlet Temp. °F			Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp. °F				Meter Inlet Temp. °F	Meter Outlet Temp. °F		
							Probe	Filter	CPM Filter	Impinger Outlet										Probe	Filter	CPM Filter	Impinger Outlet				
		695.62								NA					781.67							NA					
A 6	5	699.5	1.20	2.05	5.0	119	248	247	-	51	49	49		785.70	1.10	1.94	6.0	119	247	247		43	58	59			
5	10	703.35	1.15	1.96	5.0	120	247	249	-	50	55	55		789.15	1.10	1.94	6.0	121	247	252		43	58	58			
4	15	707.20	1.20	2.05	5.0	126	249	249	-	51	55	55		793.15	1.40	2.48	7.5	119	251	250		40	59	58			
3	20	711.11	1.25	2.14	5.0	125	250	250	-	50	56	54		797.20	1.35	2.39	7.5	119	249	250		41	60	58			
2	25	715.04	1.30	2.23	5.5	124	241	251		50	58	58		801.26	1.25	2.22	7.5	119	249	251		41	62	59			
1	30	718.82	1.10	1.88	5.5	126	250	251		50	54	55		805.29	1.25	2.22	7.5	119	249	251		41	63	59			
B 6	31	722.70	0.87	1.49	4.5	125	252	251		53	59	56		809.67	0.91	1.62	5.5	120	243	252		47	62	59			
5	40	725.52	0.92	1.59	4.5	120	250	250		49	56	52		812.13	0.93	1.65	5.5	121	243	251		47	64	59			
4	45	729.01	0.98	1.69	4.5	119	251	250		50	57	53		815.58	0.97	1.68	6.0	121	246	252		46	65	60			
3	50	732.31	0.88	1.51	4.0	123	251	250		50	54	54		818.95	0.75	1.33	5.5	122	250	257		41	65	60			
2	55	733.66	0.93	1.61	4.5	120	250	251		51	60	55		822.31	0.79	1.40	5.5	122	250	252		43	65	60			
1	60	739.00	0.87	1.51	4.0	120	250	251		51	60	55		825.15	0.63	1.12	4.0	120	250	250		49	65	61			
C 6	65	742.15	0.78	1.35	3.5	114	251	250		47	61	57		828.17	0.56	1.57	4.5	119	257	252		45	64	61			
5	70	745.11	0.81	1.41	3.5	120	251	250		47	62	58		831.30	0.83	1.48	5.0	124	252	252		47	65	61			
4	75	749.17	0.79	1.38	3.5	120	252	251		45	62	58		834.70	0.88	1.44	5.5	124	252	254		47	66	61			
3	80	751.58	0.89	1.41	3.5	121	250	250		45	62	58		837.99	0.85	1.51	5.5	124	251	254		47	66	61			
2	85	754.61	0.91	1.41	3.5	122	250	250		45	62	58		841.38	0.90	1.61	6.0	119	249	250		48	66	62			
1	90	757.80	0.89	1.41	3.5	124	250	250		46	63	59		844.77	0.87	1.55	6.0	121	248	250		48	67	62			
D 6	95	761.60	1.10	1.92	5.0	120	248	250		45	61	58		848.15	1.00	1.79	6.5	119	249	248		48	65	62			
5	100	766.48	1.10	1.91	5.0	120	243	251		47	61	59		852.50	1.20	2.14	8.5	122	251	250		48	66	62			
4	105	769.04	1.25	2.18	5.5	118	247	250		48	62	59		856.65	1.25	2.28	9.0	119	250	249		46	67	63			
3	110	773.11	1.20	2.22	5.5	119	250	251		46	62	59		860.82	1.30	2.33	9.5	119	250	250		46	67	63			
2	115	777.3	1.35	2.36	6.0	119	251	252		46	62	59		865.01	1.25	2.28	9.0	119	251	251		46	67	64			
1	120	781.47	1.20	2.18	6.0	114	249	246		49	62	59		869.23	1.25	2.28	9.0	120	251	252		46	67	64			
O=		Vm=715	ΔH=1.71			Ts=21.71								Vm=736	ΔH=1.84				Ts=20.50								

	Initialization Values			Test Run Times		ORSAT System					Sample Train Components			Air Flows	
	Meter Temp	Oxygen Content	Moisture Content	Start Time	End Time	Box No.	Bag No.	Bag Vol	cc/min * at 15 in Hg	O2 Reading	Filter No.	Nozzle No.	Nozzle Dn	ACFM	DSCFM
Run 1	5.2	17.0	13.0	0757	1006	1	1	152	0.0	132	400480	0.214	0.214	576.69	438.67
Run 2	5.7	17.0	12.0	1038	1250	1	2	152	0.0	172	400480	0.214	0.214	576.69	438.67

MOISTURE RECOVERY: RUN 1					
Impinger	1	2	3	4	Desiccant
Final wt., g					
Initial wt., g					
Difference					

RUN 2					
1	2	3	4	Desiccant	Total

Nozzle Calibration	
Tech. <u>1516</u>	Date <u>5/8/15</u>
Nozzle No. <u>6123</u>	
1	0.214
2	0.215
3	0.214
Avg. in.	0.214

See d.s. for moistures

See d.s. for moistures

EPA METHOD 5/202
FIELD DATA SHEET

Project Minimale
Smpi Loc 24 WUS SV118
Date 5-8-15
Operator NSIC/RS

Test No. 1 Runs 3-4
Pitct No. 2-3
CM 9 SM —

Meter γ 0.9954
 ΔH @ 1.95 = γ
 C_p 0.87
 P 7-3

Bar. Pres 25.14 in Hg CPM TC 117
Stat. Pres -1.30 in H₂O Impngr TC _____
Probe Lngth 7 ft
Liner Type: ☒ Glass ☐ S.S. ☐ Other

Sample Train Leak Rate (cfm)					
Run 3			Run 4		
Pretest	0.3 at 1.0	in Hg	Pretest	at	in Hg
Posttest	0.3 at 1.3	in Hg	Posttest	at	in Hg
Pitot (3 in.)	Pos. <input checked="" type="checkbox"/> Neg. <input checked="" type="checkbox"/>		Pitot (3 in.)	Pos. <input type="checkbox"/> Neg. <input type="checkbox"/>	

[illegible][illegible]

Nozzle Calibration	
Tech.	Date
Nozzle No.	
1	
2	
3	
Avg. in.	

MOISTURE RECOVERY:		RUN 3				
Impinger	1	2	3	4	Desiccant	Total
Final wt., g						
Initial wt., g						
Difference						

RUN 4					
1	2	3	4	Desiccant	Total

See d.s. for moistures

Line 4 WC 5/8/15 minutes
Test 2

Run 1

	Empty	HNO ₃ / H ₂ O	HNO ₃ / H ₂ O	Empty	km _{NO₃}	km _{NO₃}	D.C
END	830.2	814.0	776.7	689.6	765.7	777.0	918.4
START	666.5	768.5	768.8	689.1	765.2	777.5	901.5
TOT	163.7	45.5	7.9	1.5	0.5	-0.5	16.9

Run 2

	Empty	HNO ₃	HNO ₃	Empty	km _{NO₃}	km _{NO₃}	D.C
END	827.7	811.4	778.4	661.6	775.9	776.4	941.0
START	657.0	767.3	771.0	660.5	775.0	775.6	925.0
TOT	170.7	44.1	7.4	1.1	0.9	0.8	16

Run 3

	Empty	HNO ₃	HNO ₃	Empty	km _{NO₃}	km _{NO₃}	D.C
NO	825.3	822.5	779.4	691.0	771.6	780.5	936.2
SI	668	772.1	770.9	689.7	771.3	781.0	918.4
	157.3	50.4	8.5	1.3	0.3	-0.5	17.8



Modified EPA METHOD 3A /10-- Instrument Analysis Data Sheet

Project Run 44
Sample Location (S) 24 W 6 S 5V118
Test No 1
Date 5-8-15
Operators DJK/RB S

Analyzer Make / Model / Serial No. California Analytica 1/250/411063
Analyzer O₂ Range (span), %: 0 - 22.47
Analyzer CO₂ Range (span), %: 0 - 9.98
Analyzer CO₂ Range (span), PPM: _____
CO Analyzer Make / Model / Serial No. _____
Analyzer O₂ Range (span), ppm: _____

	Cylinder Serial No.	O ₂ Cert. Conc.	CO ₂ Cert. Conc.	CO Cert. Conc., PPM
Zero Gas	1310 XF14	0	0	
O ₂ /CO ₂ Mid-range	CC132877	13.02	9.98	
O ₂ /CO ₂ High-range	CC99473	22.47	9.91	
CO Mid Range				
CO High Range				

PRETEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂		CO	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0	0	0		
Mid-range:	13.02	13.0	9.98	9.99		
High-range:	22.47	22.48	9.91	9.91		

Time of Calibration 1915 to 1930

INTEGRATED BAG ANALYSIS

Location/Test No.	24 W 6 S / 1								
Run No.	1	2	3	1	2	3	1	2	3
Time Sampled	757-1006								
Time Analyzed	1930	1935	1940						
O ₂ , %	17.3	17.2	17.3						
CO ₂ , %	2.8	2.8	2.8						
CO, PPM	X	X	X						

POSTTEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂		CO	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0	0	0		
Mid-range:	13.02	9.98	9.98	9.96		
High-range:	22.47	22.50	9.91	9.94		

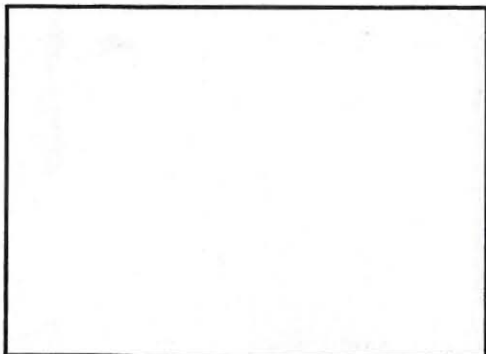
BARR**EPA METHOD 2
FIELD DATA SHEET**

Project Minn Tal
Sample Location 26 WGS SUI44
Date 5-21-15
Operators DAK/RBS/TAK
Duct Dimensions 192.0 inches
Port Length 15 inches
Pitot Tube No. 7-3 Cp 0.84
Manometer ID C-8 Bar. ID BA-23
Digital Therm ID C-8 T.C. ID 7-

	Run 1	Run 2	Run 3	Run 4
Bar Press (In Hg)	28.72			
Stat. Press (In H ₂ O)	2.35			
Temp - Dry Bulb °F				
Temp - Wet Bulb °F				
Moist Content - %				
O ₂ %				
Time of Meas.				

Pitot Leak Check Positive: OK Negative: OK

Traverse Point Information			Cyclonic Flow ∠°	Velocity Head - Inches H ₂ O				Stack Temperature - °F			
Point Number	Inches From:			Run 1 ΔP	Run 2 ΔP	Run 3 ΔP	Run 4 ΔP	Run 1 Temp.	Run 2 Temp.	Run 3 Temp.	Run 4 Temp.
A-1	Wall	Port									
2											
3											
4											
5											
6											
B-1											
2											
3											
4											
5											
6											
C-1											
2											
3											
4											
5											
6											
D-1											
2											
3											
4											
5											
6											



Schematic of Duct Cross-Section

	Run 1	Run 2	Run 3	Run 4
Stack Pres. - In Hg				
Duct Area - Sq Ft.				
Mole Weight - Md				
Mole Weight - Ms				
Avg. Temp. - °F				
Average $\sqrt{\Delta P}$				
Gas Vel - Ft/Sec				
ACFM				
SCFM				
DSCFM				



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 1

Project	U.S. Steel Corporation	Meter ID	C-8	Probe ID	7-3	Bar.Press.	28.22	in. Hg	Sample Train Leak Rate, cfm:
Sample Location	L6 WGS SV144	Meter Y	0.9982	Pitot Tube No.	7-3	Stat Press.	-0.4	in. H2O	Pretest 0.000 at 10 in. Hg
Date	05/21/15	Orifice dH@	1.9476	Pitot Cp	0.84				Posttest 0.000 at 11 in. Hg
Test	1	Run #	1	Liner Type:	Glass				Pretest Pitot leak Check Pos Pass @ >3" w.c
Operators	DJK/RBS								Posttest Pitot leak Check Neg Pass @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	0815	61.04												
1	5.0	64.00	0.280	1.12	2.95	63.99	*	111	*	*	*	86	86	9.0
2	10.0	66.94	0.260	1.05	2.86	66.85	*	111	*	*	*	86	86	9.0
3	15.0	69.88	0.290	1.17	3.02	69.87	*	111	*	*	*	87	87	9.0
4	20.0	73.00	0.320	1.29	3.18	73.05	*	112	*	*	*	89	87	9.0
5	25.0	76.12	0.320	1.30	3.19	76.24	*	111	*	*	*	90	88	9.0
6	30.0	79.25	0.290	1.17	3.04	79.28	*	112	*	*	*	91	88	9.0
7	35.0	82.28	0.290	1.18	3.04	82.32	*	111	*	*	*	91	88	9.0
8	40.0	85.33	0.340	1.38	3.29	85.61	*	111	*	*	*	93	93	9.0
9	45.0	88.81	0.380	1.55	3.50	89.12	*	111	*	*	*	94	94	9.0
10	50.0	92.34	0.340	1.39	3.32	92.44	*	111	*	*	*	96	94	9.0
11	55.0	95.87	0.430	1.76	3.74	96.18	*	111	*	*	*	98	95	9.0
12	60.0	99.24	0.350	1.44	3.38	99.56	*	112	*	*	*	99	96	9.0
13	65.0	102.95	0.380	1.56	3.53	103.10	*	111	*	*	*	99	96	9.0
14	70.0	106.11	0.460	1.89	3.89	106.98	*	111	*	*	*	101	98	9.0
15	75.0	110.00	0.510	2.11	4.11	111.09	*	111	*	*	*	101	98	9.0
16	80.0	114.18	0.520	2.15	4.15	115.24	*	111	*	*	*	102	98	9.0
17	85.0	118.28	0.500	2.07	4.07	119.31	*	111	*	*	*	101	99	9.0
18	90.0	122.36	0.510	2.11	4.11	123.42	*	111	*	*	*	102	99	9.0
19	95.0	125.99	0.360	1.49	3.46	126.88	*	111	*	*	*	102	100	9.0
20	100.0	129.45	0.400	1.66	3.65	130.53	*	111	*	*	*	103	100	9.0
21	105.0	133.18	0.500	2.07	4.08	134.61	*	111	*	*	*	104	101	9.0
22	110.0	137.22	0.450	1.87	3.88	138.49	*	111	*	*	*	105	101	9.0
23	115.0	141.37	0.480	2.00	4.01	142.50	*	111	*	*	*	105	102	9.0
24	120.0	145.00	0.500	2.08	4.10	146.60	*	111	*	*	*	105	102	9.0
End Time	1236													
Run Time	120		Avg DH=	1.62			Avg Ts=	111.13				Avg Tm=	95.96	

Integrated Gas Sampling Data :

Bag No.		Filter No.	Quartz
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.255

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	757.7	814.9	782.5	660.9	775.5	771.7	962.3	
Initial wt., g	655.5	765.2	773.4	658.5	775.6	771.7	943.0	
Difference	102.2	49.7	9.1	2.4	-0.1	0	19.3	182.6

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 2

Project	U.S. Steel Corporation	Meter ID	C-8	Probe ID	7-3	Bar.Press.	28.22	in. Hg	Sample Train Leak Rate, cfm:
Sample Location	L6 WGS SV144	Meter Y	0.9982	Pitot Tube No.	7-3	Stat Press.	-0.4	in. H ₂ O	Pretest 0.000 at 10 in. Hg
Date	05/21/15	Orifice dH@	1.9476	Pitot Cp	0.84				Posttest 0.000 at 10 in. Hg
Test	1	Run #	2	Liner Type:	Glass				Pretest Pitot leak Check Pos Pass @ >3" w.c
Operators	DJK /RBS								Posttest Pitot leak Check Neg Pass @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft ³	Velocity Head DP, in. H ₂ O	Orifice DH in. H ₂ O	Ideal Point Volume Vm, ft ³	Ideal Meter Vol Vm, ft ³	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1316	147.00												
1	5.0	150.67	0.430	1.75	3.74	150.74	*	112	*	*	*	98	99	9.5
2	10.0	154.22	0.450	1.84	3.83	154.57	*	112	*	*	*	98	99	9.5
3	15.0	158.11	0.500	2.04	4.04	158.61	*	112	*	*	*	98	99	9.5
4	20.0	162.12	0.540	2.20	4.20	162.80	*	112	*	*	*	98	99	9.5
5	25.0	166.48	0.530	2.16	4.16	166.96	*	112	*	*	*	101	99	9.5
6	30.0	170.41	0.440	1.80	3.80	170.76	*	111	*	*	*	101	99	9.5
7	35.0	173.82	0.420	1.72	3.71	174.47	*	112	*	*	*	100	99	9.5
8	40.0	177.41	0.390	1.59	3.57	178.04	*	113	*	*	*	101	99	9.5
9	45.0	181.26	0.540	2.21	4.21	182.25	*	112	*	*	*	101	99	9.5
10	50.0	185.50	0.560	2.29	4.28	186.53	*	112	*	*	*	101	99	9.5
11	55.0	189.60	0.540	2.21	4.21	190.74	*	112	*	*	*	102	99	9.5
12	60.0	194.16	0.530	2.17	4.17	194.91	*	112	*	*	*	102	100	9.5
13	65.0	197.12	0.290	1.19	3.09	198.00	*	111	*	*	*	102	100	9.5
14	70.0	200.27	0.330	1.36	3.30	201.30	*	111	*	*	*	103	101	9.5
15	75.0	204.15	0.450	1.86	3.86	205.16	*	110	*	*	*	104	101	9.5
16	80.0	208.21	0.480	1.98	3.99	209.15	*	111	*	*	*	105	101	9.5
17	85.0	212.00	0.460	1.90	3.91	213.06	*	111	*	*	*	106	102	9.5
18	90.0	215.49	0.290	1.20	3.11	216.17	*	111	*	*	*	106	103	9.5
19	95.0	218.46	0.280	1.16	3.06	219.22	*	111	*	*	*	107	104	9.5
20	100.0	221.51	0.310	1.28	3.22	222.44	*	111	*	*	*	107	104	9.5
21	105.0	224.81	0.290	1.20	3.12	225.56	*	110	*	*	*	107	104	9.5
22	110.0	228.12	0.370	1.53	3.52	229.09	*	110	*	*	*	105	105	9.5
23	115.0	231.47	0.340	1.41	3.37	232.46	*	111	*	*	*	105	104	9.5
24	120.0	235.00	0.360	1.49	3.47	235.92	*	111	*	*	*	105	104	9.5
End Time	1534													
Run Time	120		Avg DH=	1.73			Avg Ts=	111.38				Avg Tm=	101.77	

Integrated Gas Sampling Data :

Bag No.		Filter No.	Quartz
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.255

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	767.3	827.8	781.1	690.3	768.2	781.6	973.0	
Initial wt., g	664.8	774.6	768.3	686.5	772.2	782.1	949.7	
Difference	102.5	53.2	12.8	3.8	-4	-0.5	23.3	191.1

* Data Recorded on Field Data Sheet



EPA METHOD 5/29 - FIELD DATA SHEET - RUN 3

Project	U.S. Steel Corporation	Meter ID	C-8	Probe ID	7-3	Bar.Press.	28.22	in. Hg	Sample Train Leak	Rate, cfm:
Sample Location	L6 WGS SV144	Meter Y	0.9982	Pitot Tube No.	7-3	Stat Press.	-0.4	in. H2O	Pretest	0.000 at 10 in. Hg
Date	05/21/15	Orifice dH@	1.9476	Pitot Cp	0.84				Posttest	0.000 at 9 in. Hg
Test	1	Run #	3	Liner Type:	Glass				Pretest Pitot leak Check Pos	PASS @ >3" w.c
Operators	DJK /RBS								Posttest Pitot leak Check Neg	PASS @ >3" w.c

Sample Point	Sample Time DT	Actual Meter Vol Vm, ft3	Velocity Head DP, in. H2O	Orifice DH in. H2O	Ideal Point Volume Vm, ft3	Ideal Meter Vol Vm, ft3	Sample Train Vacuum in. Hg	Stack Temp Ts, °F	Sample Train Temperatures, °F					Moisture Content, %
									Filter	Probe	Impinger Outlet	Meter Inlet	Meter Outlet	
Start Time	1613	235.33												
1	5.0	238.37	0.280	1.14	3.02	238.35	*	111	*	*	*	99	99	9.5
2	10.0	241.59	0.320	1.31	3.24	241.59	*	110	*	*	*	99	99	9.5
3	15.0	244.71	0.310	1.27	3.18	244.77	*	111	*	*	*	100	99	9.5
4	20.0	248.21	0.350	1.43	3.38	248.16	*	111	*	*	*	101	99	9.5
5	25.0	251.58	0.340	1.39	3.34	251.50	*	111	*	*	*	101	99	9.5
6	30.0	254.87	0.350	1.43	3.39	254.89	*	111	*	*	*	101	99	9.5
7	35.0	258.41	0.370	1.52	3.48	258.37	*	111	*	*	*	101	99	9.5
8	40.0	261.60	0.330	1.35	3.29	261.66	*	111	*	*	*	102	99	9.5
9	45.0	265.01	0.360	1.47	3.44	265.10	*	112	*	*	*	102	99	9.5
10	50.0	268.71	0.430	1.76	3.76	268.85	*	112	*	*	*	102	99	9.5
11	55.0	272.42	0.420	1.72	3.71	272.57	*	111	*	*	*	101	99	9.5
12	60.0	275.60	0.390	1.60	3.58	276.14	*	111	*	*	*	101	99	9.5
13	65.0	279.22	0.380	1.56	3.53	279.67	*	111	*	*	*	99	98	9.5
14	70.0	282.57	0.440	1.79	3.79	283.46	*	112	*	*	*	99	98	9.5
15	75.0	286.54	0.480	1.96	3.96	287.42	*	111	*	*	*	100	98	9.5
16	80.0	290.36	0.500	2.05	4.05	291.46	*	110	*	*	*	101	98	9.5
17	85.0	294.44	0.520	2.13	4.13	295.59	*	111	*	*	*	101	98	9.5
18	90.0	298.28	0.440	1.80	3.80	299.38	*	111	*	*	*	102	98	9.5
19	95.0	301.90	0.360	1.47	3.44	302.82	*	111	*	*	*	100	98	9.5
20	100.0	305.66	0.410	1.67	3.66	306.48	*	112	*	*	*	100	98	9.5
21	105.0	308.82	0.440	1.80	3.79	310.27	*	111	*	*	*	101	98	9.5
22	110.0	312.88	0.480	1.96	3.96	314.23	*	112	*	*	*	101	98	9.5
23	115.0	318.00	0.470	1.92	3.92	318.15	*	112	*	*	*	101	98	9.5
24	120.0	320.97	0.380	1.55	3.53	321.67	*	111	*	*	*	101	98	9.5
End Time	1826													
Run Time	120		Avg DH=	1.63			Avg Ts=	111.17				Avg Tm=	99.58	

Integrated Gas Sampling Data :

Bag No.		Filter No.	Quartz
Bag Vol.	liters	Nozzle No.	Glass
Leak Rate	cc/min	Nozzle Dn.	0.255

MOISTURE RECOVERY DATA :

Impinger	1	2	3	4	5	6	Desiccant	Total
Final wt., g	770.9	810.3	775.9	662.9	771.6	764.9	938.6	
Initial wt., g	656.3	766.5	769.0	660.7	770.0	764.9	919.9	
Difference	114.6	43.8	6.9	2.2	1.6	0	18.7	187.8

* Data Recorded on Field Data Sheet



EPA METHOD 5/202
FIELD DATA SHEET

Project Mining
Smpl Loc LG 605 SU144
Date 5-21-15
Operator DRK/DBS

Test No. 1
Runs 1-2
Pitot No. 3-2
SM -

CM 8

Meter y 0.9982
Bar. Pres 28.22 in Hg
Stat. Pres -0.35 in H₂O
Probe Length 7 ft
Liner Type: CG Glass CS S. CD Other

ΔH @ 1.9426
Cp 0.84
P 7-3

CPM TC NA
Impngr TC -

Sample Train Leak Rate (cfm)			
Run 1		Run 2	
Pretest	0.0 at 10 in Hg	Pretest	0.0 at 10 in Hg
Posttest	0.0 at 11 in Hg	Posttest	0.0 at 10 in Hg
Pitot (3 in.)	Pos. <u>2</u> Neg. <u>2</u>	Pitot (3 in.)	Pos. <u>2</u> Neg. <u>2</u>

TEST RUN 1													TEST RUN 2												
Sample Point	Sample Time ΔT	Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F	Meter Volume Vm, ft ³	Velocity ΔP, in H ₂ O	Orifice ΔH, in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F		
							Probe	Filter	CPM Filter	Impinger Outlet								Probe	Filter	CPM Filter	Impinger Outlet				
		6.04								NA			147.03							NA					
A-6	5	64.00	0.28	1.12	4.0	111	250	257		64	86	86	150.67	0.43	1.77	6.0	112	251	254		66	98	89		
	10	66.94	0.26	1.05	4.0	111	250	256		62	86	86	158.21	0.48	1.88	6.5	112	252	253		64	98	89		
	15	69.88	0.27	1.13	4.0	111	250	257		60	87	87	158.11	0.50	2.06	7.0	112	251	258		65	98	89		
	20	73.00	0.32	1.24	4.0	112	250	257		60	89	87	162.12	0.54	2.22	7.0	112	251	251		64	98	89		
	25	70.12	0.32	1.30	4.0	111	251	257		59	90	88	168.48	0.53	2.18	7.5	112	249	257		63	101	89		
	30	79.25	0.29	1.17	4.0	112	250	258		58	91	88	170.44	0.44	1.82	7.5	111	250	257		62	101	89		
B-6	35	82.28	0.29	1.18	4.0	111	250	258		64	91	88	173.82	0.42	1.72	6.0	112	250	254		65	100	89		
	40	85.33	0.34	1.38	4.0	111	252	258		65	92	92	177.47	0.39	1.59	6.0	112	251	258		62	101	89		
	45	88.81	0.38	1.58	5.0	111	252	258		62	94	92	181.26	0.52	2.26	7.0	112	250	258		63	101	89		
	50	92.84	0.34	1.39	5.0	111	254	258		61	96	92	185.60	0.56	2.29	7.5	112	250	258		64	101	89		
	55	95.87	0.43	1.76	5.5	111	254	258		66	98	92	189.60	0.52	2.21	8.0	112	250	258		65	102	89		
	60	99.24	0.35	1.44	5.0	112	254	258		62	99	92	194.16	0.57	2.17	7.8	112	251	258		63	102	100		
C-6	65	102.95	0.38	1.51	6.0	111	252	258		62	99	92	197.12	0.29	1.19	4.5	111	252	258		64	102	100		
	70	106.11	0.46	1.87	6.5	111	251	257		63	101	91	200.27	0.33	1.36	5.5	111	252	258		62	103	101		
	75	110.20	0.51	2.14	7.0	111	250	257		63	101	91	204.15	0.45	1.86	6.5	110	251	260		60	104	101		
	80	114.18	0.52	2.15	7.0	111	251	258		64	102	91	208.21	0.48	1.98	7.0	111	248	257		60	105	101		
	85	118.28	0.50	2.07	7.0	111	251	258		65	101	99	212.00	0.46	1.90	7.5	111	250	258		59	106	102		
	90	122.36	0.51	2.11	7.0	111	252	258		65	102	99	215.49	0.29	1.10	6.0	111	251	258		60	106	102		
D-6	95	125.99	0.76	1.49	8.0	111	252	259		65	102	100	218.46	0.28	1.16	5.0	111	252	258		65	107	102		
	100	129.48	0.40	1.66	8.5	111	245	259		63	103	100	224.51	0.31	1.28	5.5	111	252	251		63	107	104		
	105	133.18	0.50	2.02	7.0	111	245	258		61	104	101	228.41	0.29	1.20	8.5	110	254	257		62	107	104		
	110	137.22	0.48	1.87	7.0	111	248	249		59	105	101	232.12	0.37	1.53	6.0	110	251	261		61	105	104		
	115	141.37	0.48	2.00	7.0	111	250	257		60	105	102	236.47	0.34	1.41	6.0	111	249	257		62	105	104		
	120	145.54	0.50	2.08	7.0	111	249	258		60	105	102	238.00	0.36	1.49	6.0	111	249	251		62	105	104		
0=		149.96	0.39	ΔH=1.62		Ts=11.13						149.96	0.42	ΔH=1.73		Ts=11.38							Tm=11.7		

	Initialization Values			Test Run Times		ORSAT System					Sample Train Components			Air Flows	
	Meter Temp	Oxygen Content	Moisture Content	Start Time	End Time	Box No.	Bag No.	Bag Vol	cc/min * at 15 in Hg	O2 Reading	Filter No.	Nozzle No.	Nozzle Dn	ACFM	DSCFM
Run 1	82	17.0	9.0	0835	1236	2	1	15	0	17.6	QVT	C1455	0.255	757.94	358.04
Run 2	98	17.7	9.5	1316	1534	2	2	15	0	17.6	QVT	C1454	0.252	773.44	367.67

MOISTURE RECOVERY: RUN 1					
Impinger	1	2	3	4	Desiccant
Final wt., g					
Initial wt., g					
Difference					

RUN 2					
1	2	3	4	Desiccant	Total

Nozzle Calibration	
Tech. DRK	Date 5-21-15
Nozzle No.	62105
1	0.253
2	0.255
3	0.255
Avg. in.	0.255

Pres. 846, instant 1057

See d.s. for moistures



EPA METHOD 5/202
FIELD DATA SHEET

Project Miner Inc
Smpl Loc 66 W 65 S U 1/4
Date 5-21-15
Operator DRE/RBS/FAK

Test No. 1
Runs 3-4
Pilot No. 7-3
SM -

Meter 0.9982
 ΔH @ 1.9426
Cp 0.88
P 7-3

Bar. Pres 28.22 in Hg
Stat. Pres 25.35 in H₂O
Probe Length 7 ft
Liner Type: ☒ Glass ☐ S.S. ☐ Other

CPM TC NA
Impngr TC -

Sample Train Leak Rate (cfm)			
Run 3		Run 4	
Pretest <u>0.0</u> at <u>10</u> in Hg		Pretest at in Hg	
Posttest <u>0.0</u> at <u>9</u> in Hg		Posttest at in Hg	
Pilot (3 in.) Pos. <input checked="" type="checkbox"/> Neg. <input type="checkbox"/>		Pilot (3 in.) Pos. <input type="checkbox"/> Neg. <input type="checkbox"/>	

TEST RUN 3														TEST RUN 4											
Sample Point	Sample Time ΔT	Meter Volume Vm, ft ³	Velocity ΔP , in H ₂ O	Orifice ΔH , in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F	Meter Volume Vm, ft ³	Velocity ΔP , in H ₂ O	Orifice ΔH , in H ₂ O	Train Vacuum in. Hg	Stack Temp. Ts, °F	Sample Train Temp, °F				Meter Inlet Temp, °F	Meter Outlet Temp, °F		
							Probe	Filter	CPM Filter	Impinger Outlet								Probe	Filter	CPM Filter	Impinger Outlet				
		238.87							N/A																
A-6	5.0	238.7	0.28	1.36	3.5	111	250	258		64	99	99													
5	15	241.59	0.32	1.35	3.5	110	251	257		64	99	99													
4	15	244.71	0.31	1.88	4.0	111	254	252		63	100	99													
3	20	248.21	0.35	1.47	4.0	111	247	252		62	101	99													
2	25	251.59	0.34	1.89	4.0	111	250	258		61	101	99													
1	30	254.47	0.35	1.48	4.0	111	251	252		60	101	99													
B-6	35	258.41	0.32	1.52	4.5	111	244	258		61	101	99													
5	40	261.60	0.33	1.35	4.5	111	248	258		61	102	99													
4	45	265.01	0.36	1.43	4.5	112	249	258		61	102	99													
3	50	268.31	0.43	1.26	4.5	112	249	256		60	102	99													
2	55	272.42	0.42	1.72	4.5	111	245	256		61	101	99													
1	60	275.60	0.79	1.60	4.0	111	245	256		61	101	99													
C-6	65	279.22	0.38	1.56	4.0	111	245	252		64	99	98													
5	70	282.57	0.44	1.79	4.5	112	245	252		61	99	98													
4	75	286.58	0.48	1.96	5.5	111	249	252		57	100	98													
3	80	290.36	0.50	2.05	5.5	110	249	252		58	101	98													
2	85	294.44	0.52	2.13	6.5	111	242	249		59	101	98													
1	90	298.28	0.47	1.80	5.5	111	243	252		58	102	98													
D-6	95	301.90	0.56	1.43	4.0	111	248	247		58	100	98													
5	100	305.66	0.41	1.63	4.5	112	246	251		58	100	98													
4	105	308.82	0.44	1.80	5.0	111	280	254		56	101	98													
3	110	312.68	0.41	1.96	6.0	112	249	250		58	101	98													
2	115	316.20	0.47	1.92	6.0	112	251	258		59	101	98													
1	120	320.93	0.38	1.56	5.5	111	251	258		61	101	98													
0=		325.64	0.40	1.63		Ts=111.3					Tm=97.8			Vm=		$\Delta H=$		Ts=					Tm=		

	Initialization Values			Test Run Times		ORSAT System					Sample Train Components			Air Flows	
	Meier Temp	Oxygen Content	Moisture Content	Start Time	End Time	Box No.	Bag No.	Bag Vol	cc/min * at 15 in Hg	O2 Reading	Filter No.	Nozzle No.	Nozzle Dn	ACFM	DSCFM
Run 3	99	17.7	9.84	1813	1826	-	3	15	0	12.8	OK	Class	0.255	4.125	360.08
Run 4															

MOISTURE RECOVERY:		RUN 3				
Impinger	1	2	3	4	Desiccant	Total
Final wt., g						
Initial wt., g						
Difference						

RUN 4					
1	2	3	4	Desiccant	Total

Nozzle Calibration	
Tech.	Date
Nozzle No.	
1	See Run 1
2	
3	
Avg. in.	

See d.s. for moistures

BARR ENGINEERING CO.

Mantac LG WGS

CHECKED BY _____
DATE _____NAME 7AK
DATE 5/21
SHEET 1 IN SET
PAGE _____ IN FILE

5/21/15

EPA M-29
moisture catch

Run 1	Empty	HNO ₃ /H ₂ O ₂	HNO ₃ /H ₂ O ₂	Empty	Kmno ₄	Kmno ₄	D.C.
END	757.7	814.9	782.5	660.9	775.5	771.7	942.3
START	655.5	765.2	773.4	658.5	775.6	771.7	943.0
Total	102.2	49.7	9.1	2.4	-0.1	0.0	19.3

total
182.6

Run 2	Empty	HNO ₃ /H ₂ O ₂	HNO ₃ /H ₂ O ₂	Empty	Kmno ₄	Kmno ₄	D.C.
END	767.3	827.8	781.1	690.3	748.1	781.2	973.0
START	664.8	774.6	768.3	686.5	772.2	782.1	949.7
	102.5	53.2	12.8	3.8	-4	-0.5	23.3

Total = 191.1

Run 3	Empty	HNO ₃ /H ₂ O ₂	HNO ₃ /H ₂ O ₂	Empty	Kmno ₄	Kmno ₄	D.C.
END	770.9	810.3	775.9	662.9	771.4	764.9	938.6
START	656.3	766.5	769.0	660.7	770.0	764.9	919.9
	114.6	43.8	6.9	2.2	1.6	0	18.7

total 187.8

EPA METHOD 3A -- Instrument Analysis Data Sheet

BARR

Project Minn + 9c
 Sample Location(s): Line 6 WGS SV147
 Test No: 1
 Date: 5-21-15
 Operators: DJK/RBS/TAK

Analyzer Make / Model / Serial No. Cal Analy/200/411063
 Analyzer O₂ Range (span), %: 0-22.47
 Analyzer CO₂ Range (span), %: 0-9.98

	Cylinder Serial No.	O ₂ Cert. Conc.	
		O ₂ Cert. Conc.	CO ₂ Cert. Conc.
Zero Gas	1010 XF14	0	0
O ₂ /CO ₂ Mid-range	CC102877	10.02	9.98
O ₂ /CO ₂ High-range	CC99437	22.47	4.91

PRETEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0.0	0	0.0
Mid-range:	10.02	10.01	9.98	10.0
High-range:	22.47	22.49	4.91	4.92

Time of Calibration 0720 to 0735

INTEGRATED BAG ANALYSIS

Location/Test No.

Run No.

Time Sampled

Time Analyzed

O₂, %CO₂, %

<u>Line 6 WGS 1</u>		
1	2	3
0815-1236	1316-1534	1613-1826
0740	0745	0753
17.6	17.6	17.8
2.4	2.4	2.5

POSTTEST ANALYZER CALIBRATION DATA

	O ₂		CO ₂	
	Cylinder Value, %	Analyzer Calibration Response, %	Cylinder Value, %	Analyzer Calibration Response, %
Zero Gas	0	0	0	0
Mid-range:	10.02	9.99	9.98	9.98
High-range:	22.47	22.51	22.49 4.91	4.93

Appendix C

Laboratory Reports and Sample Chain of Custody

Barr Engineering

5150 West 76th Street
Edina, MN 55439

Project Number: 23/69-1635.00100 004

Lead and Mercury

EPA Method 29 Analysis

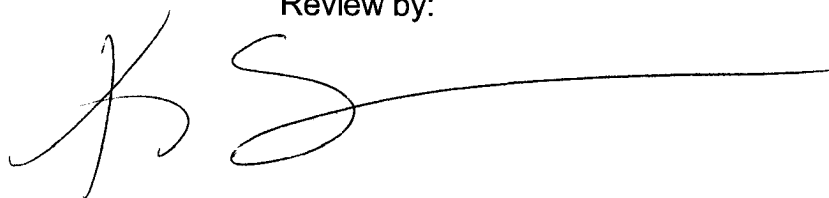
Analytical Report
24789



Element One, Inc.
6319-D Carolina Beach Rd., Wilmington, NC 28412
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 24789
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

A handwritten signature in black ink, consisting of a large, stylized 'K' followed by a long horizontal line that ends in a small loop.

Katie Strickland, B.S. Chemist
June 10, 2015

Report Reviewed and Finalized By:

A handwritten signature in black ink, featuring a large, stylized 'K' followed by a series of loops and a long horizontal line.

Ken Smith, Laboratory Director
June 10, 2015

SUMMARY OF RESULTS

Summary of Analysis

L3 WG Stack - Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	5% HNO ₃ / 10% H ₂ O ₂ µg	Empty Impinger µg	KMnO ₄ µg	HCl µg
-----	---	-----	-----	-----	-----	-----	-----
Run 1	#1	9.32	2.91	0.671	< 0.2	0.889	4.85
	#2		2.90	0.736	< 0.2	0.904	4.78
Run 2	#1	6.74	0.596	0.912	< 0.2	0.822	4.40
	#2		0.597	0.973	< 0.2	0.805	4.37
Run 3	#1	7.32	0.274	1.38	< 0.2	1.03	4.61
	#2		0.270	1.40	< 0.2	1.05	4.63

Front Half – L3 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-1 FH Total µg	Run 2 24789-2 FH Total µg	Run 2 24789-2 FH dup Total µg	Run 3 24789-3 FH Total µg
-----	-----	-----	-----	-----
Lead	112	81.8	82.4	75.4

Back Half – L3 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-1 BH Total µg	Run 2 24789-2 BH Total µg	Run 2 24789-2 BH dup Total µg	Run 3 24789-3 BH Total µg
-----	-----	-----	-----	-----
Lead	0.392	0.309	0.304	0.551

Summary of Analysis

L4 WG Stack - Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	5% HNO ₃ / 10% H ₂ O ₂ µg	Empty Impinger µg	KMnO ₄ µg	HCl µg
Run 1	#1	5.52	0.437	0.813	< 0.2	0.521	3.67
	#2		0.443	0.863	< 0.2	0.564	3.73
Run 2	#1	6.27	0.443	1.10	-----*	0.710	4.03
	#2		0.443	1.09	-----*	0.698	4.02
Run 3	#1	5.89	0.189	0.892	< 0.2	0.708	4.11
	#2		0.192	0.837	< 0.2	0.723	4.13
Reagent Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
05.06.15	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4

*Fraction was received as an empty container.

Front Half – L4 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-4 FH Total µg	Run 2 24789-5 FH Total µg	Run 2 24789-5 FH dup Total µg	Run 3 24789-6 FH Total µg	Reagent Blank 05.06.15 24789-7 FH Total µg
Lead	43.6	61.7	61.7	64.3	0.280

Back Half – L4 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-4 BH Total µg	Run 2 24789-5 BH Total µg	Run 2 24789-5 BH dup Total µg	Run 3 24789-6 BH Total µg	Reagent Blank 05.06.15 24789-7 BH Total µg
Lead	0.447	0.322	0.328	0.437	< 0.1

Summary of Analysis

L6 WG Stack - Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	5% HNO ₃ / 10% H ₂ O ₂ µg	Empty Impinger µg	KMnO ₄ µg	HCl µg
Run 1	#1	6.22	0.299	1.24	< 0.2	< 0.5	4.64
	#2		0.301	1.25	< 0.2	< 0.5	4.71
Run 2	#1	7.36	0.366	1.65	< 0.2	0.703	4.67
	#2		0.362	1.55	< 0.2	0.694	4.72
Run 3	#1	8.31	0.261	1.71	< 0.2	2.50	3.84
	#2		0.263	1.72	< 0.2	2.48	3.84
Reagent Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
05.21.15	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4

Front Half – L6 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-8 FH Total µg	Run 2 24789-9 FH Total µg	Run 2 24789-9 FH dup Total µg	Run 3 24789-10 FH Total µg	Reagent Blank 05.21.15 24789-11 FH Total µg
Lead	29.8	31.7	29.0	28.5	0.623

Back Half – L6 WG Stack - Summary of Method 29 Metals Analysis

Element	Run 1 24789-8 BH Total µg	Run 2 24789-9 BH Total µg	Run 2 24789-9 BH dup Total µg	Run 3 24789-10 BH Total µg	Reagent Blank 05.21.15 24789-11 BH Total µg
Lead	0.297	0.349	0.357	0.309	< 0.1

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Barr Engineering	Element One #:	24789
Client ID:	23/69-1635.00100 004	Analyst:	DAAM, DBW & DMR
Method:	Method 29	Dates Received:	05/15,18 & 27/15
Analytes:	Pb & Hg	Dates Analyzed:	05/21-06/10/15

Summary of Analysis

The Method 29 samples were digested, prepared, and analyzed according to Method 29 protocol. Samples were analyzed for mercury on a PerkinElmer FIMS-100 CVAA mercury analyzer. The samples were analyzed for lead on a PerkinElmer ELAN 6100 ICP-MS.

Detection Limits

The FIMS-100 CVAA instrument reporting limit for mercury was 0.004 µg per aliquot analyzed. The ICP-MS instrument reporting limit was 1.0µg/L for lead.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD), spike sample recovery, and second source calibration verification data are summarized in the Quality Control Section. All QA/QC data was within the criteria of the method.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values. The ICP analysis of the Front Half Reagent Blank samples revealed detectable concentrations of lead. The reported results relate only to the items tested or calibrated.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Mercury Duplicate Analysis RPD

(Method 29 QC limits: < 10% for RPD)

Run Number	Front half	5% HNO ₃ / 10% H ₂ O ₂	Empty Impinger	KMnO ₄	HCl
L3 WG Stack-M29-R1	0.3%	9.2%	NA	1.7%	1.4%
L3 WG Stack-M29-R2	0.1%	6.5%	NA	2.0%	0.6%
L3 WG Stack-M29-R3	1.1%	1.2%	NA	2.6%	0.5%
L4 WG Stack-M29-R1	1.4%	5.9%	NA	7.9%	1.4%
L4 WG Stack-M29-R2	0.1%	0.2%	----	1.6%	0.3%
L4 WG Stack-M29-R3	1.2%	6.4%	NA	2.0%	0.5%
Reagent Blank 05.06.15	NA	NA	NA	NA	NA
L6 WG Stack-M29-R1	0.5%	0.6%	NA	NA	1.5%
L6 WG Stack-M29-R2	1.0%	6.7%	NA	1.4%	1.1%
L6 WG Stack-M29-R3	0.7%	0.8%	NA	0.6%	0.0%
Reagent Blank 05.21.15	NA	NA	NA	NA	NA

Mercury Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Run Number		Front half	5% HNO ₃ / 10% H ₂ O ₂	Empty Impinger	KMnO ₄	HCl
L3 WG Stack-M29-R3	#1	118%	102%	99%	94%	91%
	#2	119%	103%	100%	95%	90%
L4 WG Stack-M29-R3	#1	104%	103%	97%	95%	92%
	#2	103%	104%	98%	95%	91%
L6 WG Stack-M29-R3	#1	121%	93%	93%	97%	93%
	#2	122%	95%	94%	95%	90%

Summary of Quality Control Data

Metals Duplicate Analysis RPD

(Method 29 QC limits: < 20% for RPD)

Element	L3 WG Stack-R2 Front Half	L3 WG Stack -R2 Back Half	L4 WG Stack -R2 Front Half	L4 WG Stack -R2 Back Half
	RPD	RPD	RPD	RPD
Lead	0.8%	1.7%	0.0%	1.9%

Element	L6 WG Stack-R2 Front Half	L6 WG Stack -R2 Back Half
	RPD	RPD
Lead	8.9%	2.4%

Metals Analysis Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Element	L3 WG Stack-R3 Front Half	L3 WG Stack -R3 Back Half	L4 WG Stack -R3 Front Half	L4 WG Stack -R3 Back Half
	Recovery	Recovery	Recovery	Recovery
Lead	97%	100%	100%	101%

Element	L6 WG Stack-R3 Front Half	L6 WG Stack -R3 Back Half
	Recovery	Recovery
Lead	90%	98%

05.29.15 - Second Source Calibration Check Recoveries

(Method 29 QC limits: $\pm 10\%$ for Second Source Continuing Check Standard*)

Element	1 ppb	50 ppb	100 ppb*	250 ppb
Lead	114%	102%	104%	94%

06.03.15 - Second Source Calibration Check Recoveries

(Method 29 QC limits: $\pm 10\%$ for Second Source Continuing Check Standard*)

Element	1 ppb	50 ppb	100 ppb*	250 ppb
Lead	95%	103%	104%	100%

SAMPLE CUSTODY



Request for Laboratory Analytical Services

24789
 No 20095

Report Results To	Check One:		Send Invoice To	Project Number <u>23169-1635.00 100 004</u>			
	<input type="checkbox"/> Barr Engineering Company 3128 14th Avenue East Hibbing, MN 55435-4803 (218) 262-8600 Attention: <u>Tom Kuchinski</u> (Print Name) <u>952-832-2727</u> (Direct Phone No.)			<input checked="" type="checkbox"/> Barr Engineering Company 5150 West 76th Street Edina, MN 55439-2330 (952) 832-2600 Attn: Accounts Payable 4700 West 77th Street Minneapolis, MN 55435-4803 Ph. (952) 832-2600 Fax (952) 832-2601 Barr Project Contact: (Print Name)			
Special Instructions and/or specific regulatory requirements: (method, limit of detection, etc.) <u>As Pb only no particulate determination</u>							
Sample Identification	Date/Time Collected	Media I.D. # <small>Filter, beaker</small>	Type		METHOD	SAMPLE FRACTION	Remarks
			Grab	Comp			
1. <u>L3 W6 Suck Drain T2R0</u>	<u>5/6/15</u>	<u>400483, LSS</u>		<input checked="" type="checkbox"/>	<u>14-29 Hg Pb</u>	<u>As Pb</u>	<u>7 TL</u>
2. <u>T2R1</u>	<u>5/6/15</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>#1 Filter</u>	<u>#2 As Pb</u>	<u>6</u>
3. <u>T2R2</u>	<u>5/7/15</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>#3 As Pb</u>	<u>#4 As Pb</u>	<u>6</u>
4. <u>T2R3</u>	<u>5/7/15</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>#5 As Pb</u>	<u>#6 As Pb</u>	<u>6</u>
5.					<u>#7 As Pb</u>	<u>#8 As Pb</u>	
6.					<u>#9 As Pb</u>	<u>#10 As Pb</u>	
7.					<u>#11 As Pb</u>	<u>#12 As Pb</u>	
8.					<u>#13 As Pb</u>	<u>#14 As Pb</u>	
9.					<u>#15 As Pb</u>	<u>#16 As Pb</u>	
10.					<u>#17 As Pb</u>	<u>#18 As Pb</u>	

Chain of Custody	Collected by (Print Name): <u>Tom Kuchinski BARR</u>	Relinquished by: <u>Pete Hamlin</u>	Received by: <u>Pete Hamlin</u>	Date/Time: <u>5/14/15 12:00</u>
	Collector's Signature: <u>Tom Kuchinski</u>	Date/Time: <u>5/7/15</u>		
	Laboratory: <u>Element 1</u>			
	Method of Shipment: <input checked="" type="checkbox"/> Sampler <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS Other: _____			
	Sample Condition upon Receipt: <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain) <u>Samples received in good condition. No empty containers.</u>	Received at Lab by: <u>Log Buntor</u>		<u>5/15/15 10:05</u> <u>5/18/15 11:00</u>

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy

Version 1 - Created 07/01/14



Nº 20101

Business Units/Environmental Admin/Technical & Support Services/Air Sampling/Other/COC CDR ALG 07-01-14

Version 1 - Control 07/01/14



Request for Laboratory Analytical Services

No 20100

24789
 24871 XRB 5.28.15

Report Results To	Check One:		Project Number																																			
	<input type="checkbox"/> Barr Engineering Company 3128 14th Avenue East Hibbing, MN 55435-4803 (218) 262-8600	<input checked="" type="checkbox"/> Barr Engineering Company 5150 West 76th Street Edina, MN 55439-2330 (952) 832-2600	23 / 69 - 1635.00 100 004																																			
Send Invoice To	Attention: Tom Kuchinski (Print Name)		Barr Project Contact: (Print Name) Accounts Payable - Ref # above																																			
	952-832-2777 (Direct Phone No.)																																					
Special instructions and/or specific regulatory requirements: (method, limit of detection, etc.)																																						
Sample Identification		Date/Time Collected	Media I.D. #	Type																																		
				Grab Comp QC																																		
1. LG WGS TIR1		5/21/15	Quartzite	X																																		
2. L TIR2		L	I	X																																		
3. L TIR3		L	I	X																																		
4. Reagent blank TIR0		L	I	X																																		
5.																																						
6.																																						
7.																																						
8.																																						
9.																																						
10.																																						
<table border="1"> <thead> <tr> <th colspan="2">METHOD</th> <th colspan="2">SAMPLE FRACTION</th> <th rowspan="2">Total No. of Containers</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>M-204 Hg, Pb</th> <th>#1 Filter</th> <th>#2 0.1 H₂O₂ Fast R</th> <th>#3 0.1 H₂O₂ / H₂O₂</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td></td> </tr> </tbody> </table>					METHOD		SAMPLE FRACTION		Total No. of Containers	Remarks	M-204 Hg, Pb	#1 Filter	#2 0.1 H ₂ O ₂ Fast R	#3 0.1 H ₂ O ₂ / H ₂ O ₂					6						6						6						6	
METHOD		SAMPLE FRACTION		Total No. of Containers	Remarks																																	
M-204 Hg, Pb	#1 Filter	#2 0.1 H ₂ O ₂ Fast R	#3 0.1 H ₂ O ₂ / H ₂ O ₂																																			
				6																																		
				6																																		
				6																																		
				6																																		
Collected by (Print Name): Tom Kuchinski (BARR)		Relinquished by: [Signature]		Received by: [Signature]	Date/Time: 5/26/15 10:15																																	
Collector's Signature: [Signature]		Date/Time: 5/21/15																																				
Laboratory: Element 1																																						
Method of Shipment: <input type="checkbox"/> Sampler <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS Other: _____																																						
Sample Condition upon Receipt: <input type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)																																						
Chain of Custody		Received at Lab by: [Signature]		5/27/15 @ 10:50																																		
		No empty containers		Via FedEx rec'd in good condition																																		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy

Version 1 - Created 07/01/14



Request for Laboratory Analytical Services

No 20100

24789
 24871 AS 5.28.15

Report Results To	Check One:		Project Number					
	<input type="checkbox"/> Barr Engineering Company 3128 14th Avenue East Hibbing, MN 55435-4803 (218) 262-8600	<input checked="" type="checkbox"/> Barr Engineering Company 5150 West 76th Street Edina, MN 55439-2330 (952) 832-2600	23 / 69 - 1635.00 100 004					
Send Invoice To	Attention: Tom Kuchinski		Barr Engineering Company					
	(Print Name)		Attn: Accounts Payable					
		(Direct Phone No.) 952-832-2727	4700 West 77th Street					
			Minneapolis, MN 55435-4803					
			Ph. (952) 832-2600 Fax (952) 832-2601					
			Barr Project Contact: (Print Name) Acct Payable - Ref # above					
Special instructions and/or specific regulatory requirements: (method, limit of detection, etc.)								
Sample Identification	Date/Time Collected	Media I.D. #	Type		METHOD	SAMPLE FRACTION	Total No. of Containers	Remarks
			Grab	Comp				
1. LG WGS TIR1	5/21/15	Quartz Filter	X		M-20 Hg, Pb	#1 E. Her		6
2. TIR2			X		#3 0.1 HNO3 Fast R		6	
3. TIR3			X		#4 HNO3/H2O2		6	
4. Reagent Blank TIR0			X		#5 7.7 0.1 N HNO3		6	
					#6 KNO3/HNO3			
					#7 HCL			
					#8 0.1 HNO3			
					#9 HNO3/H2O2			
					#10 KNO3/HNO3			
					#11 8N HCL			

Chain of Custody	Collected by (Print Name): Tom Kuchinski (BARR)	Relinquished by:	Received by:	Date/Time:
	Collector's Signature: Tom Kuchinski	Date/Time: 5/21/15	Pete Warden	5/21/15 10:15
	Laboratory: ElementOne			
	Method of Shipment: <input type="checkbox"/> Sampler <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS Other:			
Sample Condition upon Receipt: <input type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)		Received at Lab by: Julie Condon 5/21/15 @ 10:50 via FedEx		
		No empty containers		

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy

Version 1 - Created 07/01/14

ANALYTICAL DATA

Analytical Calculations

Metals-

$$\text{Element Results } (\mu\text{g}) = \text{ICP Results } (\mu\text{g/L}) * \text{Dilution} * \text{Final Volume (L)}$$

Where-

ICP Results= Raw sample concentration (ppb)--*ICP-Data Sheet*

Dilution= $\frac{\text{Diluted Volume}}{\text{Aliquot}}$ --*ICP-MS Run Sheet*

Final Volume= FH= Final Volume (FV)--*Sample Submission*

BH= $\frac{\text{Received Volume (BV)} * \text{Final Volume (FV)}}{\text{Aliquot (Used)}}$ --*Sample Submission*

Mercury-

$$\text{Mercury Results } (\mu\text{g}) = \frac{\text{CVAA Results } (\mu\text{g}) * \text{Final Volume (ml)}}{\text{Aliquot (ml)}}$$

Where-

CVAA Results= Raw sample reading (μg)--*Hg-Data Sheet*

Aliquot= Sample Aliquot (Alq.)--*Hg-Data Sheet*

Final Volume= Final Volume (FV)*--*Sample Submission*

* With the exception of the BH fraction where-
= Received Volume (BV)--*Sample Submission*

Analytical Calculations

Spike Recovery-

$$\text{Spike (\%)} = \frac{(\text{Spiked Result } (\mu\text{g/L}) - \text{Sample Result } (\mu\text{g/L}))}{\text{Spike Amount } (\mu\text{g/L})} \times 100$$

Where-

Spike Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Sample Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Spike Amount--*ICP-MS Spike Table*

Duplicate Analysis RPD-

$$\text{RPD (\%)} = \frac{(\text{Duplicate Result } (\mu\text{g/L}) - \text{Sample Result } (\mu\text{g/L}))}{\text{Average } (\mu\text{g/L})} \times 100$$

Where-

Sample Result and Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

$$\text{Average} = \frac{(\text{Duplicate} + \text{Sample Results})}{2}$$

FH / BH Separate

Analysis Due Date 05.26.15

QA/QC/Report Due Date 05.28.15

Client Barr Engineering

Project No 23/69-1635.00100 004

Date Rec 05.15 & 18.15

Time Rec 1005 & 1100

HNO₃ Lot: 114070

HF Lot: 514040

HCl Lot: 85821

Ref. Method:

Volume Marked Y/N

Volume Loss Y (N)?

29

Sample Identification

1	L3 WG Stack-M29-R1	4	L4 WG Stack-M29-R1	7	Reagent Blank
2	L3 WG Stack-M29-R2	5	L4 WG Stack-M29-R2		
	L3 WG Stack-M29-R2 Duplicate		L4 WG Stack-M29-R2 Duplicate		
3	L3 WG Stack-M29-R3	6	L4 WG Stack-M29-R3		
	L3 WG Stack-M29-R3 Spike		L4 WG Stack-M29-R3 Spike		

Analyses Requested

Samples 1-7 Pb

Samples 1-7 Hg

Runs / FB	Fil / Ace (FH)	HNO ₃ (FH)	5% HNO ₃ /10% H ₂ O ₂ (BH)	HNO ₃ (A)	KMnO ₄ (B)	HCl (C)
	pH <2.0 Y/N	pH <2.0 Y/N	pH <2.0 Y/N	pH <2.0 Y/N	pH <2.0 Y/N	pH <2.0 Y/N
Lab ID	Fil ID	BV ml	BV ml	FV ml	BV ml	FV ml
1		105	100	1070	335	50
2.D		90		1060	330	
3.S		95		1160	330	
4		115		1190	245	
5.D		100		1020	310	
6.S		95		510	255	
					96	
					395	
					390	
					235	

M-29 Reagent Blank

Lab ID	Fraction	BV, ml	FV, ml	Comments
7	C 7 FH Acetone Blank			
	C 8A FH 0.1N HNO ₃	300	100	cooled down 100 mls of C8A
	C 8A A 0.1N HNO ₃	300		
	C 8B B DI H ₂ O	102	100+33	33 mls of C8B & 100 mls of C10
	C 9 BH 5% HNO ₃ /10% H ₂ O ₂	200	2050	cooled down 100 mls of C9
	C 10 B 4% KMnO ₄ /10% H ₂ SO ₄	100	100+33	100 mls of C10 & 33 mls of C8B
	C 11 C 8N HCl DI H ₂ O	225	400	
	C 12 FH Filter			

Lab Communications

1 FH SS has a brown tint to it.
 LRB + EFH + BH spiked with 100 µl of standard A @ 25 ppm ~ KE 5-28-15
 C8B Hg + spiked with 200 µl of our standard Hg standard (033015-6) ~ KE 5-28-15

PM Analysis completed by Client ---Reconstitute C2 in HNO₃ and combine with FH---05.18.15 LLB

Fractions Received: Runs/FB; C1, C2, C3, C4, C5A, C5B, C5C---RB; C12 (2), C7, C8A, C8B, C9, C10, C11 ---05.18.15 LLB

SS Page 1 of 1

5/19/2015 12:31:23 PM

SS by JAD

Labeled By/Date

JAD 5/19/15

FH Prep By/Date KE 5-28-15

BH Prep By/Date JAD 5-20-15

BH/FH Prep By/Date JAD 5-28-15

PM Prep By/Date

A Prep By/Date JAD 5-20-15

B Prep By/Date JAD 5-22-15

C Prep By/Date JAD 5-27-15

ID Verification By / Date KE 5-19-15

cleaned glassware KE 5-28-15
 cleaned bottles JAD 5-28-15

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AIR TESTING SAMPLE SUBMISSION FORM

Lab ID 24789

FH / BH Separate

Analysis Due Date 06.04.15

QA/QC/Report Due Date 06.08.15

Client Barr Engineering
Project No 23/69-1635.00100 004

Date Rec 05.27.15
Time Rec 1050

HNO₃ Lot 114070 HF Lot 511040 HCl Lot 97264
Volume Marked Y N Volume Loss Y (N)? Ref. Method: 29

Sample Identification

8	L6 WG Stack-M29-R1	11	Reagent Blank		
9	L6 WG Stack-M29-R2				
	L6 WG Stack-M29-R2 Duplicate				
10	L6 WG Stack-M29-R3				
	L6 WG Stack-M29-R3 Spike				
Analyses Requested		Samples 8-11	Pb		
		Samples 8-11	Hg		

Runs / FB	Fill / Ace (FH)		HNO ₃ (FH)		5% HNO ₃ /10% H ₂ O ₂ (BH)			HNO ₃ (A)		KMnO ₄ (B)		HCl (C)	
	pH <2.0	Y / N	pH <2.0	Y / N	pH <2.0	Y / N		pH <2.0	Y / N	pH <2.0	Y / N	pH <2.0	Y / N
Lab ID	Fill ID	BV ml	BV ml	FV ml	BV ml	Used	FV ml	BV ml	FV ml	BV ml	FV ml	BV ml	FV ml
8			90	100	460	230	50	94	200	390	500	225	460
9.D			90	↓	460	230	↓	94	↓	375	↓	230	↓
10.S			95	↓	460	230	↓	106	↓	370	↓	230	↓

M-29 Reagent Blank

Lab ID	Fraction		BV, ml	FV, ml	Comments
11	C 7	FH	Acetone Blank		
	C 8A	FH	0.1N HNO ₃	300	100
	C 8A	A	0.1N HNO ₃	300	
	C 8B	B	DI H ₂ O	100	100+33
	C 8	BH	5% HNO ₃ /10% H ₂ O ₂	205	50
	C 10	B	4% KMnO ₄ /10% H ₂ SO ₄	100	100+33
	C 11	C	8N HCl DI H ₂ O	235	460
	C 12	FH	Filter		

Lab Communications

C 8B + was spiked with 100 ul of BSA @ 25ppm
C 8B Hg + was spiked with 200 ul of Hg std @ 25ppm (0.33 ul = 6) (DA 6.2.15)

Fractions Received: Runs/FB: C1, C3, C4, C5A, C5B, C5C—RB: C12, C8A, C8B, C9, C10, C11 —05.27.15 LLB

SS Page1 of 1
5/28/2015 3:23:46 PM
SS by LAB
Labeled By/Date YAS 5.28.15

FH Prep By/Date DA 6.3.15 A Prep By/Date DA 5.29.15
BH Prep By/Date DA 6.3.15 B Prep By/Date DA 6.1.15
BH/FH Prep By/Date DA 6.3.15 C Prep By/Date DA 6.2.15
PM Prep By/Date _____ ID Verification By / Date DA 5.28.15

Hg 8H prep DA 5.29.15
cleaned glassware DA 6.3.15
cleaned bottles DA 6.3.15

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24789 Barr Engineering M29 Report Packet

Page 21 of 76

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Method 29 Microwave Worksheet

Lab ID # e 24778

Client: 24789

Date Digested: 5-28-15 Initials: DAM Worksheet Prepared by: DAM

Auto Sample Loc.	Sample Lab ID	Sample Weight (g)	# of filters digested	Spike	Prep Volume (ml)	Weight In Micro / Weight Out Micro	Units
2	24778-URB						
1	-URB+			100% Std A 1830 F			
3	-1		1				
4	-2						
5	-3						
6	-4						
7	-5						
16	-6						
8	-7		1 of 3				
9	24789-URB						
10	-URB+			100% Std A			
11	-1		1				
12	-2						
13	-3						
14	-4						
15	-5						
N/A							
Std A Lot: 02/14/15-A Std B Lot: 02/14/15-B Std C Lot: 02/14/15-C Std F Lot: 02/14/15-F HP Lot: 5/11/040 HNO ₃ Lot: 11/14/070							

Element One, Inc. Form 104 - Revision 1.0

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Sample/Batch Report

April 11/15

User Name: icp
 Computer Name: F88NT12-ICPMS
 Sample File: C:\Elandata\Sample\Y3.sam
 Report Date/Time: Monday, June 01, 2015 09:04:09

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Int. Quant.	Prep. Vol.	Allquot Vol.	Diluted Vol.	Solids Ratio
	5	QC Std 2		Sample					
303		24839-1		Sample					
304		24839-2		Sample					
305	d	24839-2		Duplicate of 3					
306		24839-3		Sample					
307	s	24839-3		Spike - 1 of 5					
308		24839-4		Sample					
309		24839-5		Sample					
310		24839-6		Sample					
311	d	24839-6		Duplicate of 9					
312		24839-7		Sample					
313	s	24839-7		Spike - 1 of 11					
314		24839-8		Sample					
315		24839-9		Sample					
316	d	24839-9		Duplicate of 14					
317		24839-10		Sample					
318	s	24839-10		Spike - 1 of 16					
319		24839-11		Sample					
1		QC Std 1		Sample					
3		QC Std 4		Sample					
5		QC Std 2		Sample					
401		LRB FH		Sample					
402	s	LRB FH		Spike - 1 of 22					
403		24789-1 FH		Sample					
404		24789-2 FH		Sample					
405	d	24789-2 FH		Duplicate of 25					
406		24789-3 FH		Sample					
407	s	24789-3 FH		Spike - 1 of 27					
408		24789-4 FH		Sample					
409		24789-5 FH		Sample					
410	d	24789-5 FH		Duplicate of 30					
411		24789-6 FH		Sample					
412	s	24789-6 FH		Spike - 1 of 32					
413		24789-7 FH		Sample					
414		LRB BH		Sample					
415	s	LRB BH		Spike - 1 of 35					
416		24789-1 BH		Sample					
417		24789-2 BH		Sample					
418	d	24789-2 BH		Duplicate of 38					
419		24789-3 BH		Sample					
420	s	24789-3 BH		Spike - 1 of 40					
421		24789-4 BH		Sample					
422		24789-5 BH		Sample					
423	d	24789-5 bH		Duplicate of 43					
424		24789-6 bH		Sample					
425	s	24789-6 BH		Spike - 1 of 45					
426		24789-7 BH		Sample					
427		LRB		Sample					
428	s	LRB		Spike - 1 of 48					

429	24805-1	Sample
430	24805-2	Sample
431 d	24805-2	Duplicate of 51
432	24805-3	Sample
433 s	24805-3	Spike - 1 of 53
434	24805-4	Sample
6	QC Std 3	Sample
7	QC Std 5	Sample
8	QC Std 6	Sample
9	QC Std 7	Sample
435 x10	24789-1 FH	Sample
436 x10	24789-2 FH	Sample
437 x10d	24789-2 FH	Duplicate of 61
438 x10	24789-3 FH	Sample
439 x10a	24789-3 FH	Spike - 1 of 63
440 x5	24789-5 FH	Sample
441 x5d	24789-5 FH	Duplicate of 65
442 x5	24789-6 FH	Sample
443 x5s	24789-6 FH	Spike - 1 of 67

Dataset Report

User Name: icp
Computer Name: F88NT12-ICPMS
Dataset File Path: C:\Elandata\DataSet\052915-6\
Report Date/Time: Monday, June 01, 2015 09:04:05

April 6/1/15

Autosampler Position: 443

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot. Vol.	Diluted Vol.
16:54:21 Fri 29-May-15	Blank		Blank					
16:55:30 Fri 29-May-15	Standard 1		Standard #1					
16:56:36 Fri 29-May-15	Standard 2		Standard #2					
16:57:47 Fri 29-May-15	Standard 3		Standard #3					
16:58:56 Fri 29-May-15	QC Std 1		QC Std #1					
17:00:05 Fri 29-May-15	QC Std 2		QC Std #2					
17:01:13 Fri 29-May-15	QC Std 3		QC Std #3					
17:02:22 Fri 29-May-15	QC Std 4		QC Std #4					
17:03:32 Fri 29-May-15	QC Std 5		QC Std #5					
17:04:40 Fri 29-May-15	QC Std 6		QC Std #6					
17:05:49 Fri 29-May-15	QC Std 7		QC Std #7					
17:06:58 Fri 29-May-15	QC Std 9		QC Std #9					
17:08:07 Fri 29-May-15	QC Std 10		QC Std #10					
17:09:16 Fri 29-May-15	QC Std 2		Sample					
17:10:25 Fri 29-May-15	24839-1		Sample					
17:11:34 Fri 29-May-15	24839-2		Sample					
17:12:42 Fri 29-May-15	24839-2	d	Duplicate of 16					
17:13:51 Fri 29-May-15	24839-3		Sample					
17:15:00 Fri 29-May-15	24839-3	s	Spike - 1 of 18					
17:16:08 Fri 29-May-15	24839-4		Sample					
17:17:17 Fri 29-May-15	24839-5		Sample					
17:18:25 Fri 29-May-15	24839-6		Sample					
17:19:34 Fri 29-May-15	24839-6	d	Duplicate of 22					
17:20:44 Fri 29-May-15	QC Std 1		QC Std #1					
17:21:53 Fri 29-May-15	QC Std 4		QC Std #4					
17:23:03 Fri 29-May-15	24839-7		Sample					
17:24:12 Fri 29-May-15	24839-7	s	Spike - 1 of 28					
17:25:21 Fri 29-May-15	24839-8		Sample					
17:26:29 Fri 29-May-15	24839-9		Sample					
17:27:38 Fri 29-May-15	24839-9	d	Duplicate of 29					
17:28:46 Fri 29-May-15	24839-10		Sample					
17:29:55 Fri 29-May-15	24839-10	s	Spike - 1 of 31					
17:31:04 Fri 29-May-15	24839-11		Sample					
17:32:14 Fri 29-May-15	QC Std 1		Sample					
17:33:23 Fri 29-May-15	QC Std 4		Sample					
17:34:31 Fri 29-May-15	QC Std 1		QC Std #1					
17:35:40 Fri 29-May-15	QC Std 4		QC Std #4					
17:36:49 Fri 29-May-15	Blank		Blank					
17:38:16 Fri 29-May-15	Standard 1		Standard #1					
17:39:44 Fri 29-May-15	Standard 2		Standard #2					
17:41:11 Fri 29-May-15	Standard 3		Standard #3					
17:42:38 Fri 29-May-15	QC Std 2		Sample					
17:44:07 Fri 29-May-15	LRB FH		Sample					

17:45:34 Fri 29-May-15	LRB FH	s	Spike - 1 of 43
17:47:01 Fri 29-May-15	24789-1 FH		Sample
17:48:28 Fri 29-May-15	24789-2 FH		Sample
17:49:55 Fri 29-May-15	24789-2 FH	d	Duplicate of 46
17:51:22 Fri 29-May-15	24789-3 FH		Sample
17:52:50 Fri 29-May-15	24789-3 FH	s	Spike - 1 of 48
17:54:17 Fri 29-May-15	24789-4 FH		Sample
17:55:44 Fri 29-May-15	24789-5 FH		Sample
17:57:11 Fri 29-May-15	24789-5 FH	d	Duplicate of 51
17:58:41 Fri 29-May-15	QC Std 1		QC Std #1
18:00:08 Fri 29-May-15	QC Std 4		QC Std #4
18:01:38 Fri 29-May-15	24789-6 FH		Sample
18:03:05 Fri 29-May-15	24789-6 FH	s	Spike - 1 of 55
18:04:32 Fri 29-May-15	24789-7 FH		Sample
18:05:59 Fri 29-May-15	LRB BH		Sample
18:07:27 Fri 29-May-15	LRB BH	s	Spike - 1 of 58
18:08:54 Fri 29-May-15	24789-1 BH		Sample
18:10:21 Fri 29-May-15	24789-2 BH		Sample
18:11:48 Fri 29-May-15	24789-2 BH	d	Duplicate of 61
18:13:15 Fri 29-May-15	24789-3 BH		Sample
18:14:43 Fri 29-May-15	24789-3 BH	s	Spike - 1 of 63
18:16:12 Fri 29-May-15	QC Std 1		QC Std #1
18:17:39 Fri 29-May-15	QC Std 4		QC Std #4
18:19:09 Fri 29-May-15	24789-4 BH		Sample
18:20:36 Fri 29-May-15	24789-5 BH		Sample
18:22:03 Fri 29-May-15	24789-5 BH	d	Duplicate of 68
18:23:30 Fri 29-May-15	24789-6 BH		Sample
18:24:58 Fri 29-May-15	24789-6 BH	s	Spike - 1 of 70
18:26:25 Fri 29-May-15	24789-7 BH		Sample
18:27:52 Fri 29-May-15	LRB		Sample
18:29:19 Fri 29-May-15	LRB	s	Spike - 1 of 73
18:30:46 Fri 29-May-15	24805-1		Sample
18:32:13 Fri 29-May-15	24805-2		Sample
18:33:41 Fri 29-May-15	24805-2	d	Duplicate of 76
18:35:10 Fri 29-May-15	QC Std 1		QC Std #1
18:36:37 Fri 29-May-15	QC Std 4		QC Std #4
18:38:06 Fri 29-May-15	24805-3		Sample
18:39:34 Fri 29-May-15	24805-3	s	Spike - 1 of 80
18:41:01 Fri 29-May-15	24805-4		Sample
18:42:30 Fri 29-May-15	QC Std 1		QC Std #1
18:43:58 Fri 29-May-15	QC Std 4		QC Std #4
08:12:55 Mon 01-Jun-15	QC Std 3		Sample
08:14:22 Mon 01-Jun-15	QC Std 5		Sample
08:15:49 Mon 01-Jun-15	QC Std 6		Sample
08:17:16 Mon 01-Jun-15	QC Std 7		Sample
08:26:25 Mon 01-Jun-15	LRB FH		Sample
08:27:52 Mon 01-Jun-15	LRB FH	s	Spike - 1 of 89
08:29:19 Mon 01-Jun-15	24789-1 FH		Sample
08:30:46 Mon 01-Jun-15	24789-2 FH		Sample
08:32:14 Mon 01-Jun-15	24789-2 FH	d	Duplicate of 92
08:33:41 Mon 01-Jun-15	24789-3 FH		Sample
08:35:08 Mon 01-Jun-15	24789-3 FH	s	Spike - 1 of 94
08:36:35 Mon 01-Jun-15	24789-4 FH		Sample
08:38:02 Mon 01-Jun-15	24789-5 FH		Sample
08:39:29 Mon 01-Jun-15	24789-5 FH	d	Duplicate of 97
08:40:59 Mon 01-Jun-15	QC Std 1		QC Std #1

08:42:27 Mon 01-Jun-15	QC Std 4		QC Std #4
08:44:40 Mon 01-Jun-15	24789-1 FH	x10	Sample
08:46:07 Mon 01-Jun-15	24789-2 FH	x10	Sample
08:47:35 Mon 01-Jun-15	24789-2 FH	x10d	Duplicate of 102
08:49:02 Mon 01-Jun-15	24789-3 FH	x10	Sample
08:50:29 Mon 01-Jun-15	24789-3 FH	x10s	Spike - 1 of 104
08:51:56 Mon 01-Jun-15	24789-5 FH	x5	Sample
08:53:23 Mon 01-Jun-15	24789-5 FH	x5d	Duplicate of 106
08:54:50 Mon 01-Jun-15	24789-6 FH	x5	Sample
08:56:17 Mon 01-Jun-15	24789-6 FH	x5s	Spike - 1 of 108
08:57:47 Mon 01-Jun-15	QC Std 1		QC Std #1
08:59:14 Mon 01-Jun-15	QC Std 4		QC Std #4

elementOne
Analyst:--DBW--

ICP-MS RUN SHEET
6/1/2015

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
401		LRB FH		Sample		100
402	s	LRB FH		Spike - 1 of 22		100
403		24789-1 FH		Sample		100
404		24789-2 FH		Sample		100
405	d	24789-2 FH		Duplicate of 25		100
406		24789-3 FH		Sample		100
407	s	24789-3 FH		Spike - 1 of 27		100
408		24789-4 FH		Sample		100
409		24789-5 FH		Sample		100
410	d	24789-5 FH		Duplicate of 30		100
411		24789-6 FH		Sample		100
412	s	24789-6 FH		Spike - 1 of 32		100
413		24789-7 FH		Sample		100
414		LRB BH		Sample		50
415	s	LRB BH		Spike - 1 of 35		50
416		24789-1 BH		Sample		50x2
417		24789-2 BH		Sample		50x2
418	d	24789-2 BH		Duplicate of 38		50x2
419		24789-3 BH		Sample		50x2
420	s	24789-3 BH		Spike - 1 of 40		50x2
421		24789-4 BH		Sample		50x2
422		24789-5 BH		Sample		50x2
423	d	24789-5 BH		Duplicate of 43		50x2
424		24789-6 BH		Sample		50x2
425	s	24789-6 BH		Spike - 1 of 45		50x2
426		24789-7 BH		Sample		50x2
427		LRB		Sample		100
428	s	LRB		Spike - 1 of 48		100
429		24805-1		Sample		100x2
430		24805-2		Sample		100x2
431	d	24805-2		Duplicate of 51		100x2
432		24805-3		Sample		100x2
433	s	24805-3		Spike - 1 of 53		100x2
434		24805-4		Sample		100x2
6		QC Std 3		Sample		
7		QC Std 5		Sample		
8		QC Std 6		Sample		
9		QC Std 7		Sample		
435	x10	24789-1 FH		Sample		100
436	x10	24789-2 FH		Sample		100
437	x10d	24789-2 FH		Duplicate of 61		100
438	x10	24789-3 FH		Sample		100
439	x10s	24789-3 FH		Spike - 1 of 63		100
440	x5	24789-5 FH		Sample		100
441	x5d	24789-5 FH		Duplicate of 65		100
442	x5	24789-6 FH		Sample		100
443	x5s	24789-6 FH		Spike - 1 of 67		100
Spikes are post at 0.02mL of 25ppm spiking solution lot 021415-A in a final volume of 10mL						
Submitted for QC by:		Date/Time:		QC Review By:		Date/Time:
DBW		6/1/15 9:06		KS		6/1/15 9:16:19
Re-Test Required:		No: <input checked="" type="checkbox"/>	Yes: <input type="checkbox"/>	Comments:		
Resubmitted for QC by:		Date/Time:		QC Review:		By: Date/Time:

elementOne

Monday, Jun 01, 2015 09:04 AM

Sample/Batch Report

Donna Smith
6/4/15

User Name: icp
Computer Name: F88NT12-ICPMS
Sample File: C:\Elandata\Sample\X2.sam
Report Date/Time: Thursday, June 04, 2015 09:33:41

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC STD 2		Sample					
203		24670-26		Sample					
204		24670-27		Sample					
205	d	24670-27		Duplicate of 3					
206		24670-28		Sample					
207	s	24670-28		Spike - 1 of 5					
208		24670-29 A		Sample					
209		24670-29 B		Sample					
210		24670-30		Sample					
211	d	24670-30		Duplicate of 9					
212		24670-31		Sample					
213	s	24670-31		Spike - 1 of 11					
214		24670-32		Sample					
1		QC 1		Sample					
215		24670-33		Sample					
216	d	24670-33		Duplicate of 15					
217		24670-34		Sample					
218	s	24670-34		Spike - 1 of 17					
219		24670-35		Sample					
220		24670-36 HN		Sample					
221		24670-36 DI		Sample					
222		LRB FIL		Sample					
223	s	LRB FIL		Spike - 1 of 22					
224		24670-26 FIL		Sample					
225		24670-27 FIL		Sample					
226	d	24670-27 FIL		Duplicate of 25					
227		24670-28 FIL		Sample					
228	s	24670-28 FIL		Spike - 1 of 27					
229		24670-29 A f		Sample					
230		24670-29 B f		Sample					
231		24670-30 FIL		Sample					
232	d	24670-30 FIL		Duplicate of 31					
233		24670-31 FIL		Sample					
234	s	24670-31 FIL		Spike - 1 of 33					
235		24670-32 FIL		Sample					
236		24670-33 FIL		Sample					
237	d	24670-33 FIL		Duplicate of 36					
238		24670-34 FIL		Sample					
239	s	24670-34 FIL		Spike - 1 of 38					
240		24670-35 FIL		Sample					
241		24670-36 FIL		Sample					
5		QC STD 2		Sample					
244		24868-1		Sample					
245	d	24868-1		Duplicate of 43					
246		24868-2		Sample					
247	s	24868-2		Spike - 1 of 45					
248	x5	24868-2		Sample					
249		24868-3		Sample					
250		24869-1		Sample					

251	d	24869-1	Duplicate of 49
252		24869-2	Sample
253	s	24869-2	Spike - 1 of 51
254	x5	24869-2	Sample
255		24869-3	Sample
256		24885-1	Sample
257	d	24885-1	Duplicate of 55
258		24885-2	Sample
259	s	24885-2	Spike - 1 of 57
260	x5	24885-2	Sample
301		24885-3	Sample
302		24900-1	Sample
303	d	24900-1	Duplicate of 61
304		24900-2	Sample
305	s	24900-2	Spike - 1 of 63
306	x5	24900-2	Sample
307		24900-3	Sample
308		24917-1	Sample
309	d	24917-1	Duplicate of 67
310		24917-2	Sample
311	s	24917-2	Spike - 1 of 69
312	x5	24917-2	Sample
313		24917-3	Sample
314		24789 LRB FBarr	Sample
315	s	24789 LRB FBarr	Spike - 1 of 73
316		24789-8 FH Barr	Sample
317		24789-9 FH Barr	Sample
318	d	24789-9 FH Barr	Duplicate of 76
319		24789-10 FHBarr	Sample
320	s	24789-10 FHBarr	Spike - 1 of 78
321		24789-11 FHBarr	Sample
322		24789 LRB EBarr	Sample
323	s	24789 LRB EBarr	Spike - 1 of 81
324		24789-8 BH Barr	Sample
325		24789-9 BH Barr	Sample
326	d	24789-9 BH Barr	Duplicate of 84
327		24789-10 BHBarr	Sample
328	s	24789-10 BHBarr	Spike - 1 of 86
329		24789-11 BHBarr	Sample
1		QC Std 1	Sample
3		QC Std 4	Spike - 3 of 89
5		QC STD 2	Sample
332		24851-5	Sample
333		24851-6	Sample
334	d	24851-6	Duplicate of 93
335		24851-7	Sample
336	s	24851-7	Spike - 1 of 95
337		24851-8	Sample
338		24851-9	Sample
339		24851-14	Sample
340		24851-15	Sample
341	d	24851-15	Duplicate of 100
342		24851-16	Sample
343	s	24851-16	Spike - 1 of 102
344		24851-17	Sample
345		24851-18	Sample
346		24851-19	Sample
347	x5	24851-20	Sample
348	x5	LRB TOT	Sample
349	x5s	LRB TOT	Spike - 3 of 108

350	x5	24841	Sample
351	x5d	24841	Duplicate of 110
352	x50	24841	Sample
353	x50d	24841	Duplicate of 112
354	x5	24569	Sample
355	x50	24569	Sample
1		QC Std 1	Sample
3		QC Std 4	Spike - 3 of 116
356		24869-2	Sample
357	x5	24869-2	Sample
358	x5	24789-10 FH	Sample
359	x5s	24789-10 FH	Spike - 1 of 120
360		24789-9 FH	Sample
401		24789-11 FH	Sample
402		24789-11 FH C8A unprep	Sample
403	x500	24569	Sample
1		QC Std 1	Sample
3		QC Std 4	Spike - 3 of 126
404		24670-35 FIL	Sample
405		24670-35 FIL	Sample
1		QC Std 1	Sample
3		QC Std 4	Sample
406	x5	24789-8 FH	Sample
407	x5	24789-9 FH	Sample
408	x5d	24789-9 FH	Duplicate of 133
409	x5	24789-11 FH	Sample
410		24789-9 FH	Sample
411	d	24789-9 FH	Duplicate of 136

Dataset Report

User Name: icp
Computer Name: F88NT12-ICPMS
Dataset File Path: C:\Elandata\DataSet\060315-6\
Report Date/Time: Thursday, June 04, 2015 09:34:25

Don't Print
6/4/15

Autosampler Position: 3

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot. Vol.	Diluted Vol.
16:14:23 Wed 03-Jun-15	Blank			Blank				
16:15:31 Wed 03-Jun-15	Standard 1			Standard #1				
16:16:40 Wed 03-Jun-15	Standard 2			Standard #2				
16:17:49 Wed 03-Jun-15	Standard 3			Standard #3				
16:18:56 Wed 03-Jun-15	QC Std 1			QC Std #1				
16:20:07 Wed 03-Jun-15	QC Std 2			QC Std #2				
16:21:15 Wed 03-Jun-15	QC Std 3			QC Std #3				
16:22:24 Wed 03-Jun-15	QC Std 4			QC Std #4				
16:23:34 Wed 03-Jun-15	QC Std 5			QC Std #5				
16:24:42 Wed 03-Jun-15	QC Std 6			QC Std #6				
16:25:51 Wed 03-Jun-15	QC Std 7			QC Std #7				
16:27:01 Wed 03-Jun-15	QC Std 9			QC Std #9				
16:28:09 Wed 03-Jun-15	QC Std 10			QC Std #10				
16:29:19 Wed 03-Jun-15	QC STD 2			Sample				
16:30:29 Wed 03-Jun-15	24670-26			Sample				
16:31:38 Wed 03-Jun-15	24670-27			Sample				
16:32:46 Wed 03-Jun-15	24670-27	d		Duplicate of 16				
16:33:55 Wed 03-Jun-15	24670-28			Sample				
16:35:03 Wed 03-Jun-15	24670-28	s		Spike - 1 of 18				
16:36:12 Wed 03-Jun-15	24670-29 A			Sample				
16:37:21 Wed 03-Jun-15	24670-29 B			Sample				
16:38:29 Wed 03-Jun-15	24670-30			Sample				
16:39:38 Wed 03-Jun-15	24670-30	d		Duplicate of 27				
16:40:49 Wed 03-Jun-15	QC Std 1			QC Std #1				
16:41:56 Wed 03-Jun-15	QC Std 4			QC Std #4				
16:48:24 Wed 03-Jun-15	24670-31			Sample				
16:49:33 Wed 03-Jun-15	24670-31	s		Spike - 1 of 26				
16:50:42 Wed 03-Jun-15	24670-32			Sample				
16:51:51 Wed 03-Jun-15	QC 1			Sample				
16:53:01 Wed 03-Jun-15	24670-33			Sample				
16:54:10 Wed 03-Jun-15	24670-33	d		Duplicate of 31				
16:55:19 Wed 03-Jun-15	24670-34			Sample				
16:56:27 Wed 03-Jun-15	24670-34	s		Spike - 1 of 32				
16:57:36 Wed 03-Jun-15	24670-35			Sample				
16:58:44 Wed 03-Jun-15	24670-36 HNO3			Sample				
16:59:55 Wed 03-Jun-15	QC Std 1			QC Std #1				
17:01:04 Wed 03-Jun-15	QC Std 4			QC Std #4				
17:02:14 Wed 03-Jun-15	24670-36 Di			Sample				
17:03:23 Wed 03-Jun-15	LRB FIL			Sample				
17:04:32 Wed 03-Jun-15	LRB FIL	s		Spike - 1 of 39				
17:05:40 Wed 03-Jun-15	24670-26 FIL			Sample				
17:06:49 Wed 03-Jun-15	24670-27 FIL			Sample				
17:07:58 Wed 03-Jun-15	24670-27 FIL	d		Duplicate of 47				

18:25:17 Wed 03-Jun-15	24900-2	s	Spike - 1 of 9
18:26:29 Wed 03-Jun-15	24900-2	x5	Sample
18:27:40 Wed 03-Jun-15	24900-3		Sample
18:28:52 Wed 03-Jun-15	24917-1		Sample
18:30:04 Wed 03-Jun-15	24917-1	d	Duplicate of
18:31:15 Wed 03-Jun-15	24917-2		Sample
18:32:27 Wed 03-Jun-15	24917-2	s	Spike - 1 of
18:33:39 Wed 03-Jun-15	24917-2	x5	Sample
18:34:51 Wed 03-Jun-15	24917-3		Sample
18:36:03 Wed 03-Jun-15	QC Std 1		QC Std #1
18:37:15 Wed 03-Jun-15	QC Std 4		QC Std #4
18:38:28 Wed 03-Jun-15	24789 LRB FH		Sample Barr
18:39:39 Wed 03-Jun-15	24789 LRB FH s		Spike - 1 of 11Barr
18:40:51 Wed 03-Jun-15	24789-8 FH		Sample Barr
18:42:03 Wed 03-Jun-15	24789-9 FH		Sample Barr
18:43:14 Wed 03-Jun-15	24789-9 FH	d	Duplicate of 1 Barr
18:44:26 Wed 03-Jun-15	24789-10 FH		Sample Barr
18:45:38 Wed 03-Jun-15	24789-10 FH	s	Spike - 1 of 11Barr
18:46:50 Wed 03-Jun-15	24789-11 FH		Sample Barr
18:48:01 Wed 03-Jun-15	24789 LRB BH		Sample Barr
18:49:13 Wed 03-Jun-15	24789 LRB BH s		Spike - 1 of 11Barr
18:50:27 Wed 03-Jun-15	QC Std 1		QC Std #1
18:51:39 Wed 03-Jun-15	QC Std 4		QC Std #4
18:52:52 Wed 03-Jun-15	24789-8 BH		Sample Barr
18:54:04 Wed 03-Jun-15	24789-9 BH		Sample Barr
18:55:16 Wed 03-Jun-15	24789-9 BH	d	Duplicate of 12Barr
18:56:27 Wed 03-Jun-15	24789-10 BH		Sample Barr
18:57:39 Wed 03-Jun-15	24789-10 BH	s	Spike - 1 of 12Barr
18:58:51 Wed 03-Jun-15	24789-11 BH		Sample Barr
19:00:04 Wed 03-Jun-15	QC Std 1		Sample
19:01:16 Wed 03-Jun-15	QC Std 4		Spike - 3 of 129
19:02:28 Wed 03-Jun-15	Blank		Blank
19:03:55 Wed 03-Jun-15	Standard 1		Standard #1
19:05:22 Wed 03-Jun-15	Standard 2		Standard #2
19:06:49 Wed 03-Jun-15	Standard 3		Standard #3
19:08:17 Wed 03-Jun-15	QC Std 1		QC Std #1
19:09:44 Wed 03-Jun-15	QC Std 2		QC Std #2
19:11:11 Wed 03-Jun-15	QC Std 3		QC Std #3
19:12:39 Wed 03-Jun-15	QC Std 4		QC Std #4
19:14:07 Wed 03-Jun-15	QC Std 5		QC Std #5
19:15:34 Wed 03-Jun-15	QC Std 6		QC Std #6
19:17:01 Wed 03-Jun-15	QC Std 7		QC Std #7
19:18:30 Wed 03-Jun-15	QC Std 9		QC Std #9
19:19:57 Wed 03-Jun-15	QC Std 10		QC Std #10
19:21:26 Wed 03-Jun-15	QC STD 2		Sample
19:22:54 Wed 03-Jun-15	24851-5		Sample
19:24:23 Wed 03-Jun-15	QC Std 1		QC Std #1
19:25:50 Wed 03-Jun-15	QC Std 4		QC Std #4
19:27:19 Wed 03-Jun-15	24851-6		Sample
19:28:46 Wed 03-Jun-15	24851-6	d	Duplicate of 1
19:30:13 Wed 03-Jun-15	24851-7		Sample
19:31:41 Wed 03-Jun-15	24851-7	s	Spike - 1 of 1
19:33:08 Wed 03-Jun-15	24851-8		Sample
19:34:35 Wed 03-Jun-15	24851-9		Sample
19:36:02 Wed 03-Jun-15	24851-14		Sample
19:37:29 Wed 03-Jun-15	24851-15		Sample

19:38:57 Wed 03-Jun-15	24851-15	d	Duplicate of 167
19:40:24 Wed 03-Jun-15	24851-16		Sample
19:41:51 Wed 03-Jun-15	24851-16	s	Spike - 1 of 15
19:43:20 Wed 03-Jun-15	QC Std 1		QC Std #1
19:44:47 Wed 03-Jun-15	QC Std 4		QC Std #4
19:46:16 Wed 03-Jun-15	24851-17		Sample
19:47:43 Wed 03-Jun-15	24851-18		Sample
19:49:10 Wed 03-Jun-15	24851-19		Sample
19:50:37 Wed 03-Jun-15	24851-20	x5	Sample
19:52:04 Wed 03-Jun-15	LRB TOT	x5	Sample
19:53:32 Wed 03-Jun-15	LRB TOT	x5s	Spike - 3 of 165
19:54:59 Wed 03-Jun-15	24841	x5	Sample
19:56:26 Wed 03-Jun-15	24841	x5d	Duplicate of 167
19:57:53 Wed 03-Jun-15	24841	x50	Sample
19:59:21 Wed 03-Jun-15	24841	x50d	Duplicate of 169
20:00:49 Wed 03-Jun-15	QC Std 1		QC Std #1
20:02:16 Wed 03-Jun-15	QC Std 4		QC Std #4
20:03:45 Wed 03-Jun-15	24569	x5	Sample
20:05:12 Wed 03-Jun-15	24569	x50	Sample
20:06:41 Wed 03-Jun-15	QC Std 1		QC Std #1
20:08:08 Wed 03-Jun-15	QC Std 4		QC Std #4
08:44:33 Thu 04-Jun-15	QC Std 1		Sample
08:46:00 Thu 04-Jun-15	QC Std 4		Spike - 3 of 177
08:47:29 Thu 04-Jun-15	24869-2		Sample
08:48:56 Thu 04-Jun-15	24869-2	x5	Sample
08:50:23 Thu 04-Jun-15	24789-10 FH	x5	Sample
08:51:50 Thu 04-Jun-15	24789-10 FH	x5s	Spike - 1 of 181
08:53:17 Thu 04-Jun-15	24789-9 FH		Sample
08:54:45 Thu 04-Jun-15	24789-11 FH		Sample
08:56:12 Thu 04-Jun-15	24789-11 FH C8A unprep		Sample
08:57:39 Thu 04-Jun-15	24569	x500	Sample
08:59:08 Thu 04-Jun-15	QC Std 1		QC Std #1
09:00:35 Thu 04-Jun-15	QC Std 4		QC Std #4
09:03:59 Thu 04-Jun-15	QC Std 1		Sample
09:05:08 Thu 04-Jun-15	QC Std 4		Spike - 3 of 189
09:06:19 Thu 04-Jun-15	24670-35 FIL		Sample
09:07:27 Thu 04-Jun-15	24670-36 FIL		Sample
09:08:38 Thu 04-Jun-15	QC Std 1		QC Std #1
09:09:47 Thu 04-Jun-15	QC Std 4		QC Std #4
09:18:42 Thu 04-Jun-15	QC Std 1		Sample
09:20:10 Thu 04-Jun-15	QC Std 4		Sample
09:21:39 Thu 04-Jun-15	24789-8 FH	x5	Sample
09:23:06 Thu 04-Jun-15	24789-9 FH	x5	Sample
09:24:33 Thu 04-Jun-15	24789-9 FH	x5d	Duplicate of 196
09:26:00 Thu 04-Jun-15	24789-11 FH	x5	Sample
09:27:28 Thu 04-Jun-15	24789-9 FH		Sample
09:28:55 Thu 04-Jun-15	24789-9 FH	d	Duplicate of 201
09:30:25 Thu 04-Jun-15	QC Std 1		QC Std #1
09:31:52 Thu 04-Jun-15	QC Std 4		QC Std #4

elementOne
Analyst:--DBW--

ICP-MS RUN SHEET
6/4/2015

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC STD 2		Sample		
314		24789 LRB FH	Barr	Sample		100
315	s	24789 LRB FH	Barr	Spike - 1 of 73		100
316		24789-8 FH	Barr	Sample		100
317		24789-9 FH	Barr	Sample		100
318	d	24789-9 FH	Barr	Duplicate of 76		100
319		24789-10 FH	Barr	Sample		100
320	s	24789-10 FH	Barr	Spike - 1 of 78		100
321		24789-11 FH	Barr	Sample		100
322		24789 LRB BH	Barr	Sample		50x2
323	s	24789 LRB BH	Barr	Spike - 1 of 81		50x2
324		24789-8 BH	Barr	Sample		50x2
325		24789-9 BH	Barr	Sample		50x2
326	d	24789-9 BH	Barr	Duplicate of 84		50x2
327		24789-10 BH	Barr	Sample		50x2
328	s	24789-10 BH	Barr	Spike - 1 of 86		50x2
329		24789-11 BH	Barr	Sample		50x2
358	x5	24789-10 FH	Barr	Sample		100
359	x5s	24789-10 FH	Barr	Spike - 1 of 120		100
360		24789-9 FH	Barr	Sample		100
401		24789-11 FH	Barr	Sample		100
402		24789-11 FH C8A unpri	Barr	Sample		100
406	x5	24789-8 FH	Barr	Sample		100
407	x5	24789-11 FH 9 <i>KS</i>	Barr	Sample		100
408	x5d	24789-11 FH 9 <i>KS</i>	Barr	Duplicate of 133		100
409	x5	24789-9 FH	Barr	Sample		100
410		24789-11 FH 9 <i>KS</i>	Barr	Sample		100
411	d	24789-11 FH 9 <i>KS</i>	Barr	Duplicate of 136		100
Spikes are post at 0.02mL of 25ppm spiking solution lot 021415-A in a final volume of 10mL						
Submitted for QC by:		Date/Time:		QC Review By:		Date/Time:
DMR		6/4/15 11:44		<i>KS</i>		6/10/15 @ 9:58
Re-Test Required:		No: <input checked="" type="checkbox"/>	Yes: <input type="checkbox"/>	Comments:		
Resubmitted for QC by:		Date/Time:		QC Review:		By: Date/Time:

ICP Standards and QC Standards Values Table

Element or Test	Mass	Symbol	Std.#1 ppb	Std.#2 ppb	Std.#3 ppb	QC #1	QC #2	QC #3	QC #4	QC #5	QC #6	A	QC #7 AB	QC #8 .25	QC #9 LRB	QC #10 LRB+	QC #11 LRB+
Lithium	6	Li															
Lithium	7	Li	1	100	500	0	1	250	100	50					0	50	100
Beryllium	9	Be	1	100	500	0	1	250	100	50				0.25	0	50	100
Boron	10	B	1	50	100	0	1	250	100	50					0	50	100
Boron	11	B	1	50	100	0	1	250	100	50					0	50	100
Sodium	23	Na	20	1100	5500	0	21	2500	1100	250	250000				0	718	
Magnesium	24	Mg	20	1100	5500	0	21	2500	1100	250	100000				0	550	
Magnesium	25	Mg	20	1100	5500	0	21	2500	1100	250	100000				0	550	
Aluminum	27	Al	1	100	500	0	1	250	100	50	100000				0	50	100
Phosphorus	31	P	20	1000	5000	0	20	2500	1000	200	100000				0	200	
Potassium	39	K	20	1100	5500	0	21	2500	1100	200	100000				0	500	
Calcium	44	Ca	50	1100	5500	0	21	2500	1100	250	300000				0	550	
Scandium	45																
Titanium	47	Ti	1	100	500	0	1	250	100	50	2000				0	50	100
Titanium	49	Ti	1	100	500	0	1	250	100	50	2000				0	50	100
Vanadium	51	V	1	100	500	0	1	250	100	50		2000			0	50	100
Vanadium	51	V	1	100	500	0	1	250	100	50		2000			0	50	100
Chromium	52	Cr	1	100	500	0	1	250	100	50		2000			0	50	100
Chromium	53	Cr	1	100	500	0	1	250	100	50		2000			0	50	100
Iron	54	Fe	20	1100	5500	0	21	2500	1100	250	250000				0		
Manganese	55	Mn	1	100	500	0	1	250	100	50		2000			0	50	100
Iron	57	Fe	20	1100	5500	0	21	2500	1100	250	250000				0		
Cobalt	59	Co	1	100	500	0	1	250	100	50					0	50	100
Nickel	60	Ni	1	100	500	0	1	250	100	50		2000			0	50	100
Copper	63	Cu	1	100	500	0	1	250	100	50		2000			0	50	100
Copper	65	Cu	1	100	500	0	1	250	100	50		2000			0	50	100
Zinc	66	Zn	1	100	500	0	1	250	100	50		1000			0	50	100
Zinc	67	Zn	1	100	500	0	1	250	100	50		1000			0	50	100
Zinc	68	Zn	1	100	500	0	1	250	100	50		1000			0	50	100
Germanium	72	Ge	1	100	500	0	1	250	100	50					0	50	100
Arsenic	75	As	1	100	500	0	1	250	100	50		1000			0	50	100
Selenium	77	Se	1	100	500	0	1	250	100	50		1000			0	50	100
Selenium	82	Se	1	100	500	0	1	250	100	50		1000			0	50	100
Strontium	88	Sr	1	100	500	0	1	250	100	50					0	50	100
Molybdenum	95	Mo	1	100	500	0	1	250	100	50	2000				0	50	100
Molybdenum	97	Mo	1	100	500	0	1	250	100	50	2000				0	50	100
Molybdenum	98	Mo	1	100	500	0	1	200	100	50	2000				0	50	100
Rhodium	103																
Silver	107	Ag	1	100	500	0	1	250	100	50		2000			0	50	100
Silver	109	Ag	1	100	500	0	1	250	100	50		2000			0	50	100
Cadmium	111	Cd	1	100	500	0	1	250	100	50		1000			0	50	100
Cadmium	114	Cd	1	100	500	0	1	250	100	50		1000			0	50	100
Tin	118	Sn	1	100	500	0	1	250	100	50					0	50	100
Antimony	121	Sb	1	100	500	0	1	250	100	50					0	50	100
Antimony	123	Sb	1	100	500	0	1	250	100	50					0	50	100
Tellurium	128	Te	1	100	500	0	1	250	100	50					0	50	100
Cesium	133																
Barium	135	Ba	1	100	500	0	1	250	100	50					0	50	100
Barium	137	Ba	1	100	500	0	1	250	100	50					0	50	100
Lanthanum	139	La	1	100	500	0	1	250	100	50					0	50	100
Tantalum	159	Ta	1	100	500	0	1	250	100	50					0	50	100
Platinum	195	Pt	1	100	500	0	1	250	100	50					0	50	100
Gold	181	Au	1	100	500	0	1	250	100	50					0	50	100
Thallium	205	Tl	1	100	500	0	1	250	100	50					0	50	100
Lead	208	Pb	1	100	500	0	1	250	100	50					0	50	100
Bismuth	209	Bi	1	100	500	0	1	250	100	50					0	50	100
Thorium	232	Th	1	100	500	0	1	250	100	50					0	50	100
Uranium	238	U	1	100	500	0	1	250	100	50					0	50	100
Krypton	83																

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MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 05/20/15 Prep By: LAW/DM SIF File #: 052115-2
 Block #1 Temperature: 93.71 Start Time: 5:50 Machine ID: #1
 Block #2 Temperature: 94.05 Stop Time: 8:10 Batch Analyst: LAW/DM
 Block #3 Temperature: 93.53 Typed By: LAW Verified By: KAM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 1338904
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 052815-1 by: LAW
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 052815-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): Lot #: 052815-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: LAW

Initial Review By: DM/KAM/LAWDate: 5-21-15Time: 3:40 pmFinal QC Review By: LAWDate: 5-22-15Time: 9:52Comments: missed 12A, 12A+ sent back at end

A/S/	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 9	24783-1BU				2	500	
10	-2BU					450	
11	-2BUD					↓	
12	-3BU					510	
13	-3BUT				↓	↓	
14	-4BU				4	680	
15	-5BU					650	
16	-5BUD					↓	
17	-6BU					765	
18	-6BUT				↓	↓	
19	-7BU				2	550	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54276 HNO_3 Lot # 1114670 HCl Lot #: 88821Persulfate Lot # 050815-1 $KMnO_4$ Lot # 050815-3 Hydrox Lot #: 050815-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

SIF File #: 059115-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 20	24783-8 BU				2	560	
✓ 21	-8 BU D				↓	↓	
22	-9 BU					570	
23	-9 BU +				↓	↓	
24	-10 BU				4	710	
25	-11 BU				↓	700	
26	-11 BU D				↓	↓	
27	-12 BU				↓	800	
28	-12 BU +				↓	↓	
✓ 29	-13 BU				↓	800	
✓ 30	24783-1A				4	200	
31	-2A				↓	↓	
32	-2AD				↓	↓	
33	-3A				↓	↓	
34	-3A +				↓	↓	
35	-4A				↓	↓	
36	-5A				↓	↓	
37	-5AD				↓	↓	
38	-6A				↓	↓	
39	-6A +				↓	↓	
40	-7A				↓	↓	
41	-8A				↓	↓	
42	-8AD				↓	↓	
43	-9A				↓	↓	
44	-9A +				↓	↓	
45	-10A				↓	↓	
46	-11A				↓	↓	
47	-11AD				↓	↓	
48	-12A				↓	↓	
49	-12A +				↓	↓	
✓ 50	-13A				↓	↓	
✓ 51	24587-LRB				4	1	
52	-LRB +				0.2	↓	TV=0.1
✓ 53	24587		.5039/50	1	0.0101	1	
✓ 54	-Dup		↓	↓ .5	0.0050	↓	

SIF File #: 052115-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
55	24587D		-5082/50	1	0.0100	1	
56	Delup		↓	.5	0.0051	↓	
✓57	22286-3 QC		-5044/50	1	0.0100	1	TV=24.1
✓58	20488-3 QC		-5054/50	1	0.0100	N	TV=33.0
✓59	24789-1BH				4	670	
60	-2BH				↓	660	
61	-2BHD				↓	↓	
62	-3BH				↓	660	
63	-3BHT				↓	↓	
64	-4BH				↓	490	
65	-5BH				↓	620	
66	-5BHD				↓	↓	
67	-6BH				↓	510	
68	-6BHT				↓	4	
69	-7BH				↓	900	
70	24789-1A				4	200	
71	-2A				↓	↓	
72	-2AD				↓	↓	
73	-3A				↓	↓	
74	-3A+				↓	↓	
75	-4A				↓	↓	
76	-6A				↓	↓	
77	-6A+				↓	↓	
78	-7A				↓	↓	
79	23937-23QC				.05	5	TV=12
80	L/L QC				1	1	
✓81	24722-22				1	100	
82	-22				2	↓	
83	-22				4	↓	
✓84	24722-4LB FH				4	100	
85	-4LB FH+				1.6	↓	
86	-5FH				8	↓	
87	-5FHD				↓	↓	
88	-6FHD				↓	↓	
89	-6FH				↓	↓	

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 052115-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 90	24782-6 PH-J				at	100	
91	-10 PH						
92	-11 PH						
93	-11 PH-D						
94	-12 PH						
95	-12 PH-L						
96	-16 PH						
97	-17 PH						
98	-17 PH-D						
99	-18 PH						
100	-18 PH						
101	-19 PH						
✓ 102	24783-16				0.05	5	
103	-16				0.1	↓	
104	-16				0.2	↓	
105							
106							

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MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 5-26-15 Prep By: DAM/LAW/JAA SIF File #: 052715-1
 Block #1 Temperature: 295 Start Time: 5:50 Machine ID: #1
 Block #2 Temperature: 295 Stop Time: 8:10 Batch Analyst: DAM
 Block #3 Temperature: Typed By: DAM Verified By: LAW

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: <u>1530904</u>
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: <u>052615-1</u> by: <u>DAM</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: <u>052615-2</u>
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): Lot #: <u>052615-3</u>
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>LAW</u>

Initial Review By: DAMDate: 5-27-15Time: 1:30 pmFinal QC Review By: LAWDate: 05-27-15Time: 4:25Comments: 24785-3CT did not SPE, 24783-16 @ 0.025

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 9	24783-5BH				4	650	
10	-5B				↓	↓	
✓ 11	24791-14B				4	500	
12	-14BD				↓	↓	
✓ 13	24788-1B				4	500	
14	-2B				↓	↓	
15	-2BD				↓	↓	
16	-3B				↓	↓	
17	-3B+				↓	↓	
18	-4B				↓	↓	
19	-5B				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54274 HNO_3 Lot # 1114070 HCl Lot #: 88821Persulfate Lot # 150815-1 $KMnO_4$ Lot # 150815-3 Hydrox Lot #: 150815-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

SIF File #: 052715-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓20	24788-6B				4	500	
21	-7B				↓	↓	
22	-8B				↓	↓	
23	-9B				↓	↓	
24	-9BD				↓	↓	
25	-10B				↓	↓	
26	-10B+				↓	↓	
27	-11B				↓	↓	
28	-12B				↓	↓	
29	-13B				↓	↓	
30	-14B				↓	↓	
31	-14BD				↓	↓	
32	-15B				↓	↓	
33	-15B+				↓	↓	
34	-16B				↓	↓	
35	-17B				↓	↓	
36	-18B				↓	↓	
37	-19B				↓	↓	
38	-20B				↓	↓	
✓39	24788-1C				4	400	
40	-2C				↓	↓	
41	-2CD				↓	↓	
42	-3C				↓	↓	
43	-3C+				↓	↓	
44	-4C				↓	↓	
45	-5C				↓	↓	
46	-6C				↓	↓	
47	-7C				↓	↓	
48	-8C				↓	↓	
49	-9C				↓	↓	
50	-9CD				↓	↓	
51	-10C				↓	↓	
52	-10C+				↓	↓	
53	-11C				↓	↓	
54	-12C				↓	↓	

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 052715-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 55	24788-13C				4	400	
56	-14C				↓	↓	
57	-14CD				↓	↓	
58	-15C				↓	↓	
59	-15C+				↓	↓	
60	-16C				↓	↓	
61	-17C				↓	↓	
62	-18C				↓	↓	
63	-19C				↓	↓	
64	-20C				↓	↓	
✓ 65	24789-1B				4	500	
66	-2B				↓	↓	
67	-2BD				↓	↓	
68	-3B				↓	↓	
69	-3B+				↓	↓	
70	-4B				↓	↓	
71	-5B				↓	↓	
72	-5BD				↓	↓	
73	-6B				↓	↓	
74	-6B+				↓	↓	
75	-7B				↓	↓	
✓ 76	24805-2B+				4	400	
77	-2BHD				↓	↓	
78	23937-230C				.05	5	TV=12
✓ 79	4L0C				1	1	TV=0.008
80	24670-13				3	100	
81	-13D				↓	↓	
82	-13+				↓	↓	
83	24670-11A				4	200	
✓ 84	24783-5B				4	500	
85	-5BD				↓	↓	
86	-6B				↓	↓	
87	-6B+				↓	↓	
88	-7B				↓	↓	
89	-8B				↓	↓	

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 052715-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 90	24783-88D				4	500	
91	-9B				↓	↓	
92	-9B+						
93	-10B						
94	-11B						
95	-11B+						
96	-12B						
97	-12B+						
98	-13B				↓	↓	
✓ 99	24783-16				0.025	5	
100	76D				↓	↓	
101	-11B+						
102							
103							
104							
105							
106							

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MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 5-27-15 Prep By: DM/KE SIF File #: 052815-1
 Block #1 Temperature: 94.94 Start Time: 5:50 Machine ID: #3
 Block #2 Temperature: 94.91 Stop Time: 8:10 Batch Analyst: DM
 Block #3 Temperature: 91.02 Typed By: DM Verified By: LAW

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: <u>1330904</u>
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: <u>052615-1</u> by <u>DM</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2): Lot #: <u>052615-2</u>
5	0.16 ug	0.40ml		40	40	Standard #3 (QC #3): Lot #: <u>052615-3</u>
6	0.20ug	0.50ml		40	40	Curve prepared by: <u>DM</u>
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	

Initial Review By: DM Date: 5-28-15 Time: 3:20pm
 Final QC Review By: LAW Date: 05-28-15 Time: 5:08
 Comments: 24799-23 ft +, 24792-6t, missed tube 24783-1b
(see 052815-2)

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 9	24788-3C				4	400	
✓ 10	-3C+				↓	↓	
✓ 11	24791-8C				↓	↓	
✓ 12	-8CD				↓	↓	
✓ 13	24699-LRB M				4	100	
14	-LRB+M				1.6	↓	
15	-1 M				4	↓	
16	-2 M				↓	↓	
17	-2 M D				↓	↓	
18	-3 M				↓	↓	
19	-3 M +				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

Spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H₂SO₄ @ 2.0ml..... HNO₃ @ 1.0ml..... Persulfate @ 3.0ml..... KMnO₄ @ 6.0ml

H₂SO₄ Lot # 54270 HNO₃ Lot # 1114070 HCl Lot # 88821

Persulfate Lot # 050815-1 KMnO₄ Lot # 050815-3 Hydrox Lot # 050815-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 05285-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
20	24699-4 M				4	100	
21	-5 M						
22	-6 M						
23	-7 M						
24	-8 M						
25	-9 M						
26	-10 M						
27	-11 M						
28	-12 M						
29	-12 M D						
30	-13 M						
31	-13 M +						
32	-14 M						
33	-15 M						
34	-16 M						
35	-17 M						
36	-18 M						
37	-19 M						
38	-20 M						
39	-21 M						
40	-22 M						
41	-22 M D						
42	-23 M						
43	-23 M +						
44	-24 M						
45	-25 M						
46	-26 M						
47	-27 M						
48	-28 M						
49	-29 M						
50	-30 M						
51	-31 M filter					50	
52	-31 HNO ₃ A						
53	-31 HNO ₃ B						
54	2479246-7 B16				20	1	

SIF File #: 052815-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓ 55	24792-6701K+				20	1	
✓ 56	24792-6						
57	-76+						
58	-7						
59	-7D						
✓ 60	247928-10, 841, 847 BIK						
61	-BIK+						
✓ 62	24792-8						
63	-9						
64	-10						
✓ 65	24841						
66	-D						
✓ 67	24847-1						
68	-1+						
69	-2						
70	-3						
✓ 71	24789-1C				4	400	
72	-2C						
73	-2CD						
74	-3C						
75	-3C+						
76	-4C						
77	-5C						
78	-5CD						
79	-6C						
80	-6C+						
81	-7C						
✓ 82	24805-1C						
83	-2C						
84	-2CD						
85	-3C						
86	-3C+						
87	-4C						
88	24823-1C						
89	-2C						

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 052815-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓ 90	24823-2CD				4	400	
91	-3C				↓	↓	
92	-3C+				↓	↓	
93	-4C				↓	↓	
94	23937-23QC				.05	5	TV=12
95	✓ 1/2 QC				1	1	TV=0.008
✓ 96	24783-8FFD				0.05	100	
97	-8FFD				↓	↓	
98	-15				4	100	
99	-15D				↓	↓	
100	-15+				↓	↓	
101	-16				0.025	5	
102	-16D				↓	↓	
103	-16+				↓	↓	
104							
105							
106							

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MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 5-28-15Prep By: LF/DAMSIF File #: 052915-1Block #1 Temperature: 93.59Start Time: 6:50Machine ID: #1Block #2 Temperature: 94.99Stop Time: 8:10Batch Analyst: DAMBlock #3 Temperature: Typed By: DAMVerified By: 1AM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: <u>1330904</u>
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: <u>052615-1</u> by: <u>DAM</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: <u>052615-2</u>
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): Lot #: <u>052615-3</u>
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>DAM</u>

Initial Review By: DAMDate: 5-29-15Time: 2:20 PMFinal QC Review By: Date: Time: Comments: Environment got wet restarted at #44, 24849-1840,

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
AKV	9	241A9-23PH			2	100	
	10	23PH+			↓	↓	
	11	24792-6			10	1	
	12	-6+			↓	↓	
	13	-6			5	↓	
	14	-6+			↓	↓	
	15	24849-184			4	720	
	16	-184D			↓	↓	
	17	-23PH			↓	660	
	18	-23PH+			↓	↓	
	19	-184			↓	200	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54226 HNO_3 Lot # 1114670 HCl Lot #: 88821Persulfate Lot # 050815-1 $KMnO_4$ Lot # 052115-3 Hydrox Lot #: 050815-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 052915-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol. ml	Spike μ g
20	24849-1AD				4	200	
21	2A				↓	↓	
22	-2A+				↓	↓	
✓ 23	24778-URB FH				4	100	
24	-URB FH+				1.6		
25	-1 FH				4		
26	-2 FH						
27	-2 FH D						
28	-3 FH						
29	-3 FH+						
30	-4 FH						
31	-5 FH						
32	-5 FH D						
33	-6 FH						
34	-6 FH+						
35	-7 FH						
36	24820-5-14/50/57 - BLR				20	1	
37	2	BLR+					
38	24820-5						
39	-6						
40	-7						
41	-8						
42	-9						
43	-10						
44	24856						
45	-dup						
46	24857						
47	-SPK						
48	24937-73 Q1				0.05	5	TV=12
49	1/C Q1				1	1	TV=2.005
50	24783-13 FH				4	100	
51	24783-16				0.025	5	
52	-16 D				↓	↓	
53	-16+				↓	↓	
54	24789-URB FH				4	100	

SIF File #: 050915-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
55	24789-LRB FH+				1.6	100	
56	-1FH				4		
57	-2FH						
58	-2FH/D						
59	-3FH						
60	-3FH+						
61	-4FH						
62	-5FH						
63	-5FH/D						
64	-6FH						
65	-6FH+						
66	-7FH						
67	24805-LRB FH				4	100	
68	-LRB FH+				1.6		
69	-1FH				4		
70	-2FH						
71	-2FH/D						
72	-3FH						
73	-3FH+						
74	-4FH						
75							
76							
77							
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89							

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 06.01.15 Prep By: DAM/KS/LAN SIF File #: 060115-1
 Block #1 Temperature: 94.14 Start Time: 9:00 Machine ID: #1
 Block #2 Temperature: 95.55 Stop Time: 10:40 Batch Analyst: DAM
 Block #3 Temperature: 93.93 Typed By: DAM Verified By: KS

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 1330904
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 060115-1 by: <u>DAM</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 060115-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): Lot #: 060115-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>DAM</u>

Initial Review By: DAM/LANDate: 06.01.15Time: 4:00Final QC Review By: LANDate: 06.02.15Time: 2:40Comments: 24851-11 BHD, 12BHT, 13BHT, 24851-21, 24789-9BHD, 24857-7BHT

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
9	24849-10H	BLK Place Holder (W)			1.4	1.720	
10	24791-LRBH				4	100	
11	-LRBHT				1.6		
12	-4H				4		
13	-5H						
14	-5H D						
15	-6H						
16	-6H+						
17	-10H						
18	-11H						
19	-11H D						

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54276 HNO_3 Lot # 1114070 HCl Lot #: 88821Persulfate Lot # 050815-1 $KMnO_4$ Lot # 052115-3 Hydrox Lot #: 052115-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

SIF File #: 060915-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓20	24791-12 BU				4	100	
21	-12 BU+				↓	↓	
22	-16 BU				↓	↓	
23	-17 BU				↓	↓	
24	-17 BUD				↓	↓	
25	-18 BU				↓	↓	
26	-18 BU+				↓	↓	
27	-19 BU				↓	↓	
28	-20 BU				↓	↓	
✓29	24851-1 BU				2	700	
30	-2 BU				↓	680	
31	-2 BUD				↓	↓	
32	-3 BU				↓	720	
33	-3 BU+				↓	↓	
34	-4 BU				↓	690	
35	-5 BU				4	790	
36	-6 BU				↓	820	
37	-6 BUD				↓	↓	
38	-7 BU				↓	820	
39	-7 BU+				↓	↓	
40	-8 BU				↓	770	
41	-9 BU				↓	330	
42	-10 BU				2	670	
43	-11 BU				↓	730	
44	-11 BUD				↓	↓	
45	-12 BU				↓	710	
46	-12 BU+				↓	↓	
47	-13 BU				↓	710	
48	-14 BU				4	760	
49	-15 BU				↓	↓	
50	-15 BUD				↓	↓	
51	-16 BU				↓	780	
52	-16 BU+				↓	↓	
53	-17 BU				↓	770	
54	-18 BU				↓	310	

SIF File #: 060115-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓ 55	24851-19B4				4	200	
56	-1A					200	
57	-2A						
58	-2AD						
59	-3A						
60	-3A+						
61	-4A						
62	-5A						
63	-6A						
64	-6AD						
65	-7A						
66	-7A+						
67	-8A						
68	-9A						
69	-10A						
70	-11A						
71	-11AD						
72	-12A						
73	-12A+						
74	-13A						
75	-14A						
76	-15A						
77	-15AD						
78	-16A						
79	-16A+						
80	-17A						
81	-18A						
82	-19A				↓	↓	
83	24851-21				.05	10	
84	-21				.1	↓	
85	-21				.2	↓	
86	23937-23AC				.05	5	TV=12
87	4/2 AC				1	1	TV=0.008
✓ 88	24789-86U				4	460	
89	-96U				↓	↓	

SIF File #: 060115-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol. ml	Spike μ g
90	24789-9BH				4	460	
91	-10BH					↓	
92	-10BH+					↓	
93	-11BH					205	
94	-8A					200	
95	-9A					↓	
96	-9A					↓	
97	-10A					↓	
98	-10A+					↓	
99	-11A				↓	↓	
✓ 100	24857				20	1	
101	24857+				↓	↓	
✓ 102	24789-6BH				4	100	
103	-6BH+				↓	↓	
✓ 104	24849-1BH				4	720	
105	-1BH dup				↓	↓	
106							

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 06-01-15

Prep By: LNW/DAM

SIF File #: 060215-1

Block #1 Temperature: 94.47

Start Time: 5:50

Machine ID: #2

Block #2 Temperature: 93.48

Stop Time: 8:10

Batch Analyst: DAM

Block #3 Temperature: 96.18

Typed By: LNW

Verified By: DAM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 133090-1
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 060115-1 by: DAM
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 060115-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): DAM Lot #: 060115-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: LNW

Initial Review By: DAM

Date: 6-2-15

Time: 3:10 PM

Final QC Review By: LNW

Date: 06-02-15

Time: 4:35

Comments: 24851-12B & 12D were switched # 70871, 24851-11 BHD, 13BH, 24892-3

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 9	24851-11BH				1	730	
10	-11BHD				↓	↓	
11	-12BH				1	710	
12	-12BHD				↓	↓	
✓ 13	-13BH				2	710	
✓ 14	24892 BIK				20	1	
15	BIKT				↓	↓	
✓ 16	24892-1				↓	↓	
17	-2				↓	↓	
18	-2D				↓	↓	
19	-3				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.**H₂SO₄ @ 2.0ml..... HNO₃ @ 1.0ml..... Persulfate @ 3.0ml..... KMnO₄ @ 6.0mlH₂SO₄ Lot # 54276 HNO₃ Lot # 1114670 HCl Lot #: 88821Persulfate Lot # 050815-4 KMnO₄ Lot # 052115-3 Hydrox Lot #: 052115-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 060215-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 20	24892-3t				20	1	
21	-4				↓	↓	
22	-5				↓	↓	
23	-6				↓	↓	
24	-7				↓	↓	
25	-8				↓	↓	
26	-9				↓	↓	
27	-10				↓	↓	
✓ 28	24849-1B				4	500	
29	-1BD				↓	↓	
30	-2B				↓	↓	
31	-2Bt				↓	↓	
✓ 32	24852-1B				4	500	
33	-2B				↓	↓	
34	-2BD				↓	↓	
35	-3B				↓	↓	
36	-3Bt				↓	↓	
37	-4B				↓	↓	
38	-5B				↓	↓	
39	-5BD				↓	↓	
40	-6B				↓	↓	
41	-6Bt				↓	↓	
42	-7B				↓	↓	
43	-8B				↓	↓	
44	-8BD				↓	↓	
45	-9B				↓	↓	
46	-9Bt				↓	↓	
47	-10B				↓	↓	
48	-11B				↓	↓	
49	-11BD				↓	↓	
50	-12B				↓	↓	
51	-12Bt				↓	↓	
52	-13B				↓	↓	
53	-14B				↓	↓	
✓ 54	24851-1B				54	500	

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 060015-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓ 55	24851-2B				4	500	
56	-2BD						
57	-3B						
58	-3B+						
59	-4B						
60	-5B						
61	-6B						
62	-6BD						
63	-7B						
64	-7B+						
65	-8B						
66	-9B						
67	-10B						
68	-11B						
69	-11BD						
70	-12B						
71	-12B+						
72	-13B						
73	-14B						
74	-15B						
75	-15BD						
76	-16B						
77	-16B+						
78	-17B						
79	-18B						
80	-19B						
✓ 81	24789-8B				4	500	
82	-9B						
83	-9BD						
84	-10B						
85	-10B+						
86	-11B						
87	24852-17				2.5	5/1000	
88	-17						
89	-17+						

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 040215-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 90	24851-21				0.1	10	
91	-21				↓	↓	
92	-21+				↓	↓	
✓ 93	23937-23 QC				.05	5	N/A
✓ 94	L/L QC				1	1	N/A
✓ 95	24670-9A#				4	200	
96	-9A+				↓	↓	
✓ 97	24875-1				10	1	
98	-1+				↓	↓	
99	-1				5	↓	
100	-1+				↓	↓	
✓ 101	24789-9BH				41	460	
✓ 102	-9BH dup				↓	↓	
✓ 103	24857				20	1	
104	-SPH				↓	↓	
105							
106							

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 6-2-15 Prep By: DAM/KAM SIF File #: 060315-1
 Block #1 Temperature: 90.42°C Start Time: 5:50 Machine ID: #2
 Block #2 Temperature: 90.22°C Stop Time: 8:10 Batch Analyst: DAM
 Block #3 Temperature: 92.52°C Typed By: KAM Verified By: DAM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 1330904
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 06015-1 by: <u>DAM</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 06015-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3): Lot #: 06015-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>KAM</u>

Initial Review By: DAMDate: 6-3-15Time: 15:06Final QC Review By: KAMDate: 06-03-15Time: 4:34Comments: 24892-3 - 24851-2 FH + 24852-2 FH +

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓ 9	24892-3				10	1	
10	-3+				↓	↓	
11	-3				5	↓	
12	-3+				↓	↓	
✓ 13	24870-10A				4	200	
14	-10A+				↓	↓	
✓ 15	24851-11BH				0.5	730	
16	-11BH D				↓	↓	
✓ 17	24851-13BH				1	710	
✓ 18	24823-12B FH				4	100	
19	-12B FH +				1.0	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg.** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.**H₂SO₄ @ 2.0ml..... HNO₃ @ 1.0ml..... Persulfate @ 3.0ml..... KMnO₄ @ 6.0mlH₂SO₄ Lot # 542716 HNO₃ Lot # 1114070 HCl Lot #: 888271Persulfate Lot # 150815-1 KMnO₄ Lot # 082115-3 Hydrox Lot #: 052115-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 060315-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 20	24823-1FH				4	100	
21	-2FH				↓	↓	
22	-2FH (D)				↓	↓	
23	-3FH				↓	↓	
24	-3FH +				↓	↓	
25	-4FH				↓	↓	
✓ 26	24847-1C				4	400	
27	-1CD				↓	↓	
28	-2C				↓	↓	
✓ 29	-2C+				↓	↓	
✓ 30	24670-4BC				4	400	
31	-5C				↓	↓	
32	-5CD				↓	↓	
33	-6C				↓	↓	
34	-6C+				↓	↓	
35	-7C				↓	↓	
36	-8C				↓	↓	
37	-8CD				↓	↓	
38	-9C				↓	↓	
39	-9C+				↓	↓	
✓ 40	-10C (aw)				↓	↓	
✓ 41	24902-1	24904 PCS			0.5055	1	
42	-2				0.5195	↓	
43	-2D				0.5401	↓	
44	-3				0.5352	↓	
45	-3+				0.5062	↓	
46	-4				0.5573	↓	
47	-5				0.5730	↓	
✓ 48	-6				0.5346	↓	
✓ 49	24852-1C				4	400	
50	-2C				↓	↓	
51	-2CD				↓	↓	
52	-3C				↓	↓	
53	-3C+				↓	↓	
54	-4C				↓	↓	

SIF File #: 060315-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 55	21852-85C				4	400	
56	-5C1D						
57	-6C						
58	-6C+						
59	-7C						
60	-8C						
61	-8C1D						
62	-9C						
63	-9C+						
64	-10C						
65	-11C						
66	-11C1D						
67	-12C						
68	-12C+						
69	-13C						
70	-14C						
✓ 71	24851-1FA				0.1	100	
72	-2FA						
73	-2FA1D						
74	-3FA						
75	-3FA+						
76	-4FA						
77	-10FA						
78	-11FA						
79	-11FA1D						
80	-12FA						
81	-12FA+						
82	-13FA						
✓ 83	24852-1FA				0.1	100	
84	-2FA						
85	-2FA1D						
86	-3FA						
87	-3FA+						
88	-7FA						
89	-6FA						

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 060315

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike μ g
✓90	24852-8FH				0.1	100	
91	-9FH				↓	↓	
92	-9FH				↓	↓	
93	23937-230C				0.05	5	TV=12
94	4CAL				1	1	TV=0.008
95	24789-8C				4	400	
96	-9C				↓	↓	
97	-9CD				↓	↓	
98	-10				↓	↓	
99	-10+				↓	↓	
100	-11C				↓	↓	
101							
102							
103							
104							
105							
106							

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 6-3-15Prep By: DAU/KAMSIF File #: 060415-2/060415-3Block #1 Temperature: 74.60Start Time: 6:50Machine ID: #2Block #2 Temperature: 75.51Stop Time: 8:10Batch Analyst: DAUBlock #3 Temperature: 72.61Typed By: DAUVerified By: LAW

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: <u>1330904</u>
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: <u>060415-1</u> by: <u>DAU</u>
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: <u>060415-2</u>
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: <u>060415-3</u>
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>DAU</u>

Initial Review By: DAUDate: 6-4-15Time: 15:10Final QC Review By: LAWDate: 06-04-15Time: 4:38Comments: 24877-23, 24877-23H, 108H, #7-680H run 060415-2, #69-97 on run 060415-3
24878-9 all fit under 4ug/ml level

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
✓9	24877-23				0.05	5	
10	-23				0.1	↓	
11	-23				0.2	↓	
✓12	23937-23 OR				0.25	5	TV=12
✓13	1100				1	1	TV=0.005
✓14	24877-16H				2	650	
15	-26H				↓	680	
16	-28H				↓	↓	
17	-36H				↓	670	
18	-38H				↓	↓	
19	-46H				4	690	

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54270 HNO_3 Lot # 1114070 HCl Lot #: 88827Persulfate Lot # 050815-1 $KMnO_4$ Lot # 052115-3 Hydrox Lot #: 02115-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

SIF File #: 060445-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol., ml	Spike µg
✓ 20	20877-SBH				4	660	
21	-5BH D				↓	↓	
22	-6BH				↓	670	
23	-6BH+				↓	↓	
24	-7BH				2	620	
25	-8BH				↓	610	
26	-8BH D				↓	↓	
27	-9BH				↓	700	
28	-9BH+				↓	↓	
29	-10BH				4	650	
30	-11BH				↓	620	
31	-11BH D				↓	↓	
32	-12BH				↓	660	
33	-12BH+				↓	↓	
34	-13BH				2	670	
35	-14BH				↓	690	
36	-14BH D				↓	↓	
37	-15BH D (20)				↓	680	
38	-15BH+				↓	↓	
39	-16BH				4	610	
40	-17BH				↓	640	
41	-17BH D				↓	↓	
42	-18BH				↓	600	
43	-18BH+				↓	↓	
44	-19BH				↓	295	
45	-20BH				↓	110	
✓ 46	24877-1A				4	700	
47	-2A				↓	↓	
48	-2AD				↓	↓	
49	-3A				↓	↓	
50	-3A+				↓	↓	
51	-4A				↓	↓	
52	-5A				↓	↓	
53	-5AD				↓	↓	
54	-6A				↓	↓	

SIF File #: 0604115-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol. ml	Spike µg
✓ 56	24877 - 6A+				✓	800	
56	- 7A						
57	- 8A						
58	- 8AD						
59	- 9A						
60	- 9A+						
61	- 10A						
62	- 11A						
63	- 11AD						
64	- 12A						
65	- 12A+						
66	- 13A						
67	- 14A						
68	- 14AD						
69	- 15A						
70	- 15A+						
71	- 16A						
72	- 17A						
73	- 17AD						
74	- 18A						
75	- 18A+						
76	- 19A						
✓ 77	- 20A				✓	✓	
✓ 78	24789 - LRB FH				✓	100	
79	- LRB FH+				1.6		
80	- 8FH				✓		
81	- 9FH						
82	- 9FHAD						
83	- 10FH						
84	- 10FH+						
85	- 11FH				✓	✓	
86	24789 - TOT LRB				✓	✓	
87	TOT LRB+				0.2		
✓ 88	24792 - 1		0.49304/50	✓	0.0395	✓	
89	- 2		0.5223/50	✓	0.0418	✓	

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 060415-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
✓ 90	24792-21		0.5223/50	4	0.0418	1	
91	-3		0.4952/50	1	0.0396	1	
92	-37		✓	1	↓	1	
93	-4		0.5296/50	1	0.0424	1	
94	-5		0.5119/50	1	0.0410	1	
95	-6		0.5023/50	1	0.0412	1	
96	-7		0.5232/50	1	0.0419	1	
✓ 97	24873-1		0.5023/50	✓	0.0402	↓	
✓ 98	24958				40	1	
99	-dup				↓	↓	
100	-SPK				↓	↓	
101							
102							
103							
104							
105							
106							

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 6.9.15Prep By: KAM/AMSIF File #: 061015-2Block #1 Temperature: 95.37Start Time: 5:50Machine ID: #1Block #2 Temperature: 94.73Stop Time: 8:10Batch Analyst: DAWBlock #3 Temperature: Typed By: KAMVerified By: KAM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std)
2	0.004 ug	0.01ml		40	40	Lot #: <u>1330904</u>
3	0.04 ug	0.10ml		40	40	Working Standard
4	0.08 ug	0.20ml		40	40	Lot #: <u>060815-1</u> by: <u>DAW</u>
5	0.16 ug	0.40ml		40	40	Standard #2 (QC #2):
6	0.20ug	0.50ml		40	40	Lot #: <u>060815-2</u>
						Standard #3 (QC #3):
						Lot #: <u>060815-3</u>
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: <u>KAM</u>

Initial Review By: DAWDate: 6.10.15Time: Final QC Review By: Date: Time: Comments:

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
9	<u>2525-ULB FH</u>				<u>4</u>	<u>100</u>	
10	<u>-ULB FH</u>				<u>1.6</u>		
11	<u>-1 FH</u>				<u>4</u>		
12	<u>-2 FH</u>						
13	<u>-2 FH D</u>						
14	<u>-3 FH</u>						
15	<u>-3 FH +</u>						
16	<u>-4 FH</u>						
17	<u>-5 FH</u>						
18	<u>-5 FH D</u>						
19	<u>-6 FH</u>						

NOTES: Lab blanks and spikes must be prepared with each batch digestion**Spike for Hg,** Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.**Digestion chemicals to be added in order at the following rate per 40ml volumes.** H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml H_2SO_4 Lot # 54276 HNO_3 Lot # 414070 HCl Lot #: 88821Persulfate Lot # 052115-1 $KMnO_4$ Lot # 052115-3 Hydrox Lot#: 152115-2

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

SIF File #: 061012-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	24965-6BH				4	100	
21	-7BH				↓	↓	
22	24961-TOTALS				4	↓	
23	↓ TOTALS				0.2	↓	700.0000
24	24961-1		0.5279/50	4	0.0419	↓	
25	-1+		↓	↓	↓	↓	
26	24987-1BH				2	710	
27	-2BH				↓	650	
28	-2BH?				↓	↓	
29	-3BH				↓	630	
30	-3BH+				↓	↓	
31	-4BH				↓	530	
32	-5BH					580	
33	-5BH/D				↓	↓	
34	-6BH				↓	600	
35	-6BH+				↓	↓	
36	-7BH				2	590	
37	-8BH				↓	600	
38	-8BH/D				↓	↓	
39	-9BH				↓	590	
40	-9BH+				↓	↓	
41	-10BH				4	590	
42	-11BH					610	
43	-11BH/D				↓	↓	
44	-12BH				↓	610	
45	-12BH+				↓	↓	
46	-13BH				↓	640	
47	-14BH				2	620	
48	-15BH				↓	570	
49	-15BH/D				↓	↓	
50	-16BH				↓	600	
51	-16BH+				↓	↓	
52	-17BH				4	620	
53	-18BH				↓	580	
54	-18BH/D				↓	↓	

elementOne

MERCURY BATCH DIGESTION - RUN WORKSHEET

SIF File #: 061015-2

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
55	24987-19BH				24	620	
56	-19BH +				↓	↓	
57	-20BH				42	660	
58	-21BH				↓	620	
59	-21BH (D)				↓	↓	
60	-22BH				↓	670	
61	-22BH +				↓	↓	
62	-23BH				4	610	
63	-24BH				↓	600	
64	-24BH (D)				↓	↓	
65	-25BH				↓	630	
66	-25BH +				↓	↓	
67	-26BH				↓	300	
68	-27BH				↓	200	
69	24916-5B				↓	500	
70	-5B (D)				↓	↓	
71	24930-1A1				↓	100	
72	24789-9A1				4	100	
73	-9A1 (D)				↓	↓	
74							
75							
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PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: Blank

Sample Date: Friday, May 29, 2015 17:36:49

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Meas Report Unit
	Li	6	41345.4		ppb
-	Sc	45	266290.3		ppb
>	Rh	103	587656		ppb
>	Ho	165	1045824.8		ppb
-	Pb	208	1711.1		ppb
	Kr	83	137.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 1

Sample Date: Friday, May 29, 2015 17:38:16

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Meas Report Unit
	Li	6	40152.8		ppb
-	Sc	45	262076.1		ppb
>	Rh	103	573216.9		ppb
>	Ho	165	1036880.1		ppb
-	Pb	208	44978.1	1.04466	ppb
	Kr	83	-60.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 2

Sample Date: Friday, May 29, 2015 17:39:44

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Meas Report Unit
	Li	6	39289.4		ppb
-	Sc	45	256308.8		ppb
>	Rh	103	563134.3		ppb
>	Ho	165	1022665.9		ppb
-	Pb	208	4211807.7	103.05466	ppb
	Kr	83	-18330.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date: Friday, May 29, 2015 17:41:11

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Meas Report Unit
	Li	6	37078.2		ppb
-	Sc	45	246104.5		ppb
>	Rh	103	548163.6		ppb
>	Ho	165	996662.2		ppb
-	Pb	208	19888924	499.38898	ppb
	Kr	83	-87214.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 2

Sample Date: Friday, May 29, 2015 17:42:38

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Meas Report Unit
	Li	6	36403.2		ppb
-	Sc	45	245373.2		ppb
>	Rh	103	548520.4		ppb
>	Ho	165	993544.2		ppb
-	Pb	208	46829.5	1.14061	ppb
	Kr	83	150.4		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Day: Friday, May 29, 2015 17:58:41

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	33429.3		ppb
-	Sc	45	232432		ppb
>	Rh	103	553427.6		ppb
>	Ho	165	1040185.9		ppb
-	Pb	208	3976.7	0.05521	ppb
	Kr	83	62.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Day: Friday, May 29, 2015 18:00:08

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	31244.4		ppb
-	Sc	45	224179.6		ppb
>	Rh	103	527144.6		ppb
>	Ho	165	991724.3		ppb
-	Pb	208	4123932.3	104.03925	ppb
	Kr	83	-16662.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-7 FH

Sample Day: Friday, May 29, 2015 18:04:32

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	32688		ppb
-	Sc	45	272982.6		ppb
>	Rh	103	551108.5		ppb
>	Ho	165	1099308.2		ppb
-	Pb	208	124722.8	2.79948	ppb
	Kr	83	-780.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: LRB BH

Sample Day: Friday, May 29, 2015 18:05:59

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	32249.4		ppb
-	Sc	45	225487.1		ppb
>	Rh	103	547512.3		ppb
>	Ho	165	1058004		ppb
-	Pb	208	8198.1	0.153	ppb
	Kr	83	51.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: LRB BH

Sample Day: Friday, May 29, 2015 18:07:27

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	33915.7		ppb
-	Sc	45	240697.5		ppb
>	Rh	103	563709.1		ppb
>	Ho	165	1085710.5		ppb
-	Pb	208	2184451.6	50.3155	ppb
	Kr	83	37.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-1 BH

Sample Day: Friday, May 29, 2015 18:08:54

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	32527.2		ppb
-	Sc	45	216263		ppb
>	Rh	103	523584.1		ppb
>	Ho	165	1029024.2		ppb
-	Pb	208	162668.1	3.91567	ppb
	Kr	83	-2109.4		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-2 BH

Sample Day Friday, May 29, 2015 18:10:21

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	34538.4		ppb
-	Sc	45	238275.6		ppb
>	Rh	103	544298		ppb
>	Ho	165	1065324.2		ppb
-	Pb	208	133311.9	3.09236	ppb
	Kr	83	-1638.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-2 BH

Sample Day Friday, May 29, 2015 18:11:48

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	37029.8		ppb
-	Sc	45	259221.5		ppb
>	Rh	103	570886.7		ppb
>	Ho	165	1105051.9		ppb
-	Pb	208	136011.3	3.03963	ppb
	Kr	83	-1764.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-3 BH

Sample Day Friday, May 29, 2015 18:13:15

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	42676.9		ppb
-	Sc	45	297312.1		ppb
>	Rh	103	599588.8		ppb
>	Ho	165	1134736.6		ppb
-	Pb	208	251492.7	5.50595	ppb
	Kr	83	-1694.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-3 BH

Sample Day Friday, May 29, 2015 18:14:43

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	45141		ppb
-	Sc	45	309570.5		ppb
>	Rh	103	591121.5		ppb
>	Ho	165	1120950.3		ppb
-	Pb	208	2493569	55.63582	ppb
	Kr	83	-1762.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Day Friday, May 29, 2015 18:16:12

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47277.3		ppb
-	Sc	45	289399.5		ppb
>	Rh	103	578116.6		ppb
>	Ho	165	1053145.3		ppb
-	Pb	208	1090.7	-0.01501	ppb
	Kr	83	60.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Day Friday, May 29, 2015 18:17:39

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47237.5		ppb
-	Sc	45	289658.3		ppb
>	Rh	103	562842.3		ppb
>	Ho	165	1028689.1		ppb
-	Pb	208	4211338.8	102.42339	ppb
	Kr	83	-18859.8		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-4 BH

Sample Day Friday, May 29, 2015 18:19:09

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	51937.9		ppb
-	Sc	45	343883.5		ppb
>	Rh	103	613058.7		ppb
>	Ho	165	1136124.8		ppb
-	Pb	208	204812.2	4.47115	ppb
	Kr	83	-1806.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-5 BH

Sample Day Friday, May 29, 2015 18:20:36

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	52625.1		ppb
-	Sc	45	328062.8		ppb
>	Rh	103	603210.2		ppb
>	Ho	165	1109339.9		ppb
-	Pb	208	144479.2	3.21867	ppb
	Kr	83	-1468.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-5 bH

Sample Day Friday, May 29, 2015 18:22:03

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	51149.5		ppb
-	Sc	45	322610.2		ppb
>	Rh	103	581090.2		ppb
>	Ho	165	1079087.9		ppb
-	Pb	208	143266.2	3.28178	ppb
	Kr	83	-1422.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-6 bH

Sample Day Friday, May 29, 2015 18:23:30

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	55237.8		ppb
-	Sc	45	339710.4		ppb
>	Rh	103	602942		ppb
>	Ho	165	1116226.9		ppb
-	Pb	208	196845	4.37395	ppb
	Kr	83	-1904.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-6 BH

Sample Day Friday, May 29, 2015 18:24:58

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	58619.6		ppb
-	Sc	45	354650.5		ppb
>	Rh	103	620090.9		ppb
>	Ho	165	1152431.2		ppb
-	Pb	208	2534620.8	55.02357	ppb
	Kr	83	-1905.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-7 BH

Sample Day Friday, May 29, 2015 18:26:25

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	52569.6		ppb
-	Sc	45	315710.8		ppb
>	Rh	103	592117.8		ppb
>	Ho	165	1097087.9		ppb
-	Pb	208	30890.9	0.66385	ppb
	Kr	83	-754		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Friday, May 29, 2015 18:35:10

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	60746		ppb
-	Sc	45	309612.7		ppb
>	Rh	103	581793.8		ppb
>	Ho	165	1062138.7		ppb
-	Pb	208	2781.2	0.02489	ppb
	Kr	83	57.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Friday, May 29, 2015 18:36:37

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	57970.3		ppb
-	Sc	45	307634.5		ppb
>	Rh	103	559004.5		ppb
>	Ho	165	1034436.4		ppb
-	Pb	208	4287480.3	103.68235	ppb
	Kr	83	-19217.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Friday, May 29, 2015 18:42:30

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	57332.1		ppb
-	Sc	45	297737.1		ppb
>	Rh	103	558573.7		ppb
>	Ho	165	1028649.3		ppb
-	Pb	208	1313	-0.00893	ppb
	Kr	83	74.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Friday, May 29, 2015 18:43:58

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	55843.2		ppb
-	Sc	45	300675.2		ppb
>	Rh	103	553707.8		ppb
>	Ho	165	1004934.5		ppb
-	Pb	208	4199279.5	104.54351	ppb
	Kr	83	-18819.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 3

Sample Date: Monday, June 01, 2015 08:12:55

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	41431.9		ppb
-	Sc	45	326755.1		ppb
>	Rh	103	619429.2		ppb
>	Ho	165	1120340		ppb
-	Pb	208	10507220	234.72792	ppb
	Kr	83	239		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 5

Sample Date: Monday, June 01, 2015 08:14:22

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	44750.1		ppb
-	Sc	45	343714.9		ppb
>	Rh	103	658266.4		ppb
>	Ho	165	1164391.9		ppb
-	Pb	208	2372653.4	50.96269	ppb
	Kr	83	193.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 6

Sample Date: Monday, June 01, 2015 08:15:49

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	55426.6		ppb
-	Sc	45	365276		ppb
>	Rh	103	564004.6		ppb
>	Ho	165	1124367.4		ppb
-	Pb	208	18561.7	0.37225	ppb
	Kr	83	-639.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 7

Sample Date: Monday, June 01, 2015 08:17:16

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	66886.1		ppb
-	Sc	45	467638.4		ppb
>	Rh	103	848410.6		ppb
>	Ho	165	1536231.6		ppb
-	Pb	208	4079	0.02553	ppb
	Kr	83	770.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: LRB FH

Sample Date: Monday, June 01, 2015 08:26:25

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	53884.5		ppb
-	Sc	45	371206.7		ppb
>	Rh	103	647319.7		ppb
>	Ho	165	1158051.2		ppb
-	Pb	208	10154.5	0.17852	ppb
	Kr	83	143.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: LRB FH

Sample Date: Monday, June 01, 2015 08:27:52

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	58321.9		ppb
-	Sc	45	375842.5		ppb
>	Rh	103	643221.9		ppb
>	Ho	165	1161587.4		ppb
-	Pb	208	1757018	37.82957	ppb
	Kr	83	134.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-4 FH

Sample Date: Monday, June 01, 2015 08:36:35

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	50035.1		ppb
-	Sc	45	582159.4		ppb
>	Rh	103	577244.9		ppb
>	Ho	165	1114320.6		ppb
-	Pb	208	19410892	435.96052	ppb
	Kr	83	-30841.2		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Monday, June 01, 2015 08:40:59

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	51574.9		ppb
-	Sc	45	343437.9		ppb
>	Rh	103	629231.9		ppb
>	Ho	165	1145449.1		ppb
-	Pb	208	3963	0.04588	ppb
	Kr	83	55		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Monday, June 01, 2015 08:42:27

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	50011.5		ppb
-	Sc	45	342468.9		ppb
>	Rh	103	612560.6		ppb
>	Ho	165	1101855.6		ppb
-	Pb	208	4511583.6	102.44169	ppb
	Kr	83	-20372.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-1 FH

Sample Date: Monday, June 01, 2015 08:44:40

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47861.7		ppb
-	Sc	45	412342.3		ppb
>	Rh	103	567432.7		ppb
>	Ho	165	1058108.8		ppb
-	Pb	208	4715247	111.51301	ppb
	Kr	83	-973.2		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-2 FH

Sample Date: Monday, June 01, 2015 08:46:07

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47774.7		ppb
-	Sc	45	432653.8		ppb
>	Rh	103	554031		ppb
>	Ho	165	1033157.9		ppb
-	Pb	208	3376784.2	81.76004	ppb
	Kr	83	-1987.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-2 FH

Sample Date: Monday, June 01, 2015 08:47:35

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47234.5		ppb
-	Sc	45	426390.1		ppb
>	Rh	103	547610.3		ppb
>	Ho	165	1021483.7		ppb
-	Pb	208	3366242.8	82.42668	ppb
	Kr	83	-1981.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-3 FH

Sample Date: Monday, June 01, 2015 08:49:02

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	48332		ppb
-	Sc	45	389721.8		ppb
>	Rh	103	564931.8		ppb
>	Ho	165	1051276.7		ppb
-	Pb	208	3167400.9	75.36823	ppb
	Kr	83	-1125.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-3 FH

Sample Date: Monday, June 01, 2015 08:50:29

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	47046.5		ppb
-	Sc	45	380715.5		ppb
>	Rh	103	557887.7		ppb
>	Ho	165	1027274.6		ppb
-	Pb	208	5087359	123.906	ppb
	Kr	83	-1096.3		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-5 FH

Sample Date: Monday, June 01, 2015 08:51:56

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	48314.5		ppb
-	Sc	45	375825.5		ppb
>	Rh	103	559888.4		ppb
>	Ho	165	1053533.4		ppb
-	Pb	208	5195259.8	123.39869	ppb
	Kr	83	-9311.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-5 FH

Sample Date: Monday, June 01, 2015 08:53:23

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	48959.6		ppb
-	Sc	45	369968.8		ppb
>	Rh	103	561750.4		ppb
>	Ho	165	1036450.9		ppb
-	Pb	208	5111731.3	123.41366	ppb
	Kr	83	-9425.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-6 FH

Sample Date: Monday, June 01, 2015 08:54:50

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	48886.2		ppb
-	Sc	45	393154.5		ppb
>	Rh	103	552746		ppb
>	Ho	165	1030574.5		ppb
-	Pb	208	5296087.8	128.58572	ppb
	Kr	83	-4399.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-6 FH

Sample Date: Monday, June 01, 2015 08:56:17

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	49285.4		ppb
-	Sc	45	396590		ppb
>	Rh	103	554734.3		ppb
>	Ho	165	1039999.2		ppb
-	Pb	208	7413338.6	178.34717	ppb
	Kr	83	-4424.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Monday, June 01, 2015 08:57:47

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	51625.2		ppb
-	Sc	45	327010.4		ppb
>	Rh	103	608808		ppb
>	Ho	165	1101540.6		ppb
-	Pb	208	1814.7	0.00047	ppb
	Kr	83	59.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Monday, June 01, 2015 08:59:14

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	48034.8		ppb
-	Sc	45	319631.5		ppb
>	Rh	103	596564.2		ppb
>	Ho	165	1080197.4		ppb
-	Pb	208	4423396.3	102.4925	ppb
	Kr	83	-19700.7		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: Blank

Sample Date: Wednesday, June 03, 2015 17:40:51

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	106446.1		ppb
-	Sc	45	345013.4		ppb
>	Rh	103	622751.7		ppb
>	Ho	165	1171766.3		ppb
-	Pb	208	3295.6		ppb
	Kr	83	52.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 1

Sample Date: Wednesday, June 03, 2015 17:42:02

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	104952		ppb
-	Sc	45	333927.9		ppb
>	Rh	103	602706		ppb
>	Ho	165	1124977.7		ppb
-	Pb	208	42296.4	0.91146	ppb
	Kr	83	-168.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 2

Sample Date: Wednesday, June 03, 2015 17:43:14

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	105167.8		ppb
-	Sc	45	342686.9		ppb
>	Rh	103	611366.4		ppb
>	Ho	165	1158088.2		ppb
-	Pb	208	4499735.2	101.83375	ppb
	Kr	83	-21074		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date: Wednesday, June 03, 2015 17:44:26

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	99657.1		ppb
-	Sc	45	336729.2		ppb
>	Rh	103	584914.2		ppb
>	Ho	165	1126888.5		ppb
-	Pb	208	21468764	499.63343	ppb
	Kr	83	-102333		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Wednesday, June 03, 2015 17:45:38

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	99120.8		ppb
-	Sc	45	325547.1		ppb
>	Rh	103	590248.8		ppb
>	Ho	165	1122141.8		ppb
-	Pb	208	11720.4	0.20078	ppb
	Kr	83	37.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 2

Sample Date: Wednesday, June 03, 2015 17:46:50

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	101753.4		ppb
-	Sc	45	335920.1		ppb
>	Rh	103	579632.3		ppb
>	Ho	165	1105715.9		ppb
-	Pb	208	43027.4	0.94631	ppb
	Kr	83	53.7		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 3

Sample Date: Wednesday, June 03, 2015 17:48:01

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	102291.7		ppb
-	Sc	45	340064.5		ppb
>	Rh	103	599861.9		ppb
>	Ho	165	1137357.7		ppb
-	Pb	208	10829295	249.68743	ppb
	Kr	83	-40.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Wednesday, June 03, 2015 17:49:14

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	99161.7		ppb
-	Sc	45	331233.1		ppb
>	Rh	103	585008.9		ppb
>	Ho	165	1108855.2		ppb
-	Pb	208	4401019.9	104.01971	ppb
	Kr	83	-20411.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 5

Sample Date: Wednesday, June 03, 2015 17:50:26

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	99933.5		ppb
-	Sc	45	331173.4		ppb
>	Rh	103	584837		ppb
>	Ho	165	1114569.9		ppb
-	Pb	208	2189703.8	51.44617	ppb
	Kr	83	46.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 9

Sample Date: Wednesday, June 03, 2015 17:51:40

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	94704.3		ppb
-	Sc	45	323208.5		ppb
>	Rh	103	578452		ppb
>	Ho	165	1121088.4		ppb
-	Pb	208	7783.7	0.10928	ppb
	Kr	83	45		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 10

Sample Date: Wednesday, June 03, 2015 17:52:51

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	93494.2		ppb
-	Sc	45	316272.7		ppb
>	Rh	103	568606.8		ppb
>	Ho	165	1096601.9		ppb
-	Pb	208	2219229.9	53.00347	ppb
	Kr	83	43.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC STD 2

Sample Date: Wednesday, June 03, 2015 17:54:05

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	98243.5		ppb
-	Sc	45	321155.8		ppb
>	Rh	103	568441.4		ppb
>	Ho	165	1069636		ppb
-	Pb	208	45575.5	1.0443	ppb
	Kr	83	51.5		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Wednesday, June 03, 2015 18:36:03

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	86261.6		ppb
-	Sc	45	355380.8		ppb
>	Rh	103	653098.8		ppb
>	Ho	165	1112690.5		ppb
-	Pb	208	1288.4	-0.04327	ppb
	Kr	83	39.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Wednesday, June 03, 2015 18:37:15

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	88512.5		ppb
-	Sc	45	361774.5		ppb
>	Rh	103	656723.3		ppb
>	Ho	165	1136804.9		ppb
-	Pb	208	4197102.7	96.77206	ppb
	Kr	83	-22408.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789 LRB FH

Sample Date: Wednesday, June 03, 2015 18:38:28

Sample De: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	84250		ppb
-	Sc	45	389468.2		ppb
>	Rh	103	658153		ppb
>	Ho	165	1160635.2		ppb
-	Pb	208	12012.9	0.2004	ppb
	Kr	83	29.5		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789 LRB FH

Sample Date: Wednesday, June 03, 2015 18:39:39

Sample De: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	89327.8		ppb
-	Sc	45	405886.5		ppb
>	Rh	103	684716.6		ppb
>	Ho	165	1202811.9		ppb
-	Pb	208	2184227.4	47.56236	ppb
	Kr	83	40.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789 LRB BH

Sample Date: Wednesday, June 03, 2015 18:48:01

Sample De: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	75180.6		ppb
-	Sc	45	273980		ppb
>	Rh	103	563565		ppb
>	Ho	165	1054499.5		ppb
-	Pb	208	5840.7	0.07209	ppb
	Kr	83	36.2		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789 LRB BH

Sample Date: Wednesday, June 03, 2015 18:49:13

Sample De: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	79751.1		ppb
-	Sc	45	359949.2		ppb
>	Rh	103	628730.2		ppb
>	Ho	165	1222848.9		ppb
-	Pb	208	2316613.9	49.63696	ppb
	Kr	83	30.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Wednesday, June 03, 2015 18:50:27

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	83174.1		ppb
-	Sc	45	317038.5		ppb
>	Rh	103	582028.2		ppb
>	Ho	165	1096725.7		ppb
-	Pb	208	4577.1	0.03594	ppb
	Kr	83	42.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Wednesday, June 03, 2015 18:51:39

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	84242.7		ppb
-	Sc	45	334560.6		ppb
>	Rh	103	594841.1		ppb
>	Ho	165	1124039.9		ppb
-	Pb	208	4356400.6	101.5718	ppb
	Kr	83	-20463.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-8 BH

Sample Date: Wednesday, June 03, 2015 18:52:52

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	77355.3		ppb
-	Sc	45	343027.5		ppb
>	Rh	103	587035.7		ppb
>	Ho	165	1217139.1		ppb
-	Pb	208	140942.3	2.96693	ppb
	Kr	83	-712.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-9 BH

Sample Date: Wednesday, June 03, 2015 18:54:04

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	84994.7		ppb
-	Sc	45	352804.2		ppb
>	Rh	103	620357.4		ppb
>	Ho	165	1197812		ppb
-	Pb	208	162794.7	3.49085	ppb
	Kr	83	-477		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-10 BH

Sample Date: Wednesday, June 03, 2015 18:55:16

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	86316.8		ppb
-	Sc	45	350155		ppb
>	Rh	103	601532.2		ppb
>	Ho	165	1179081.3		ppb
-	Pb	208	163994.6	3.57415	ppb
	Kr	83	-487.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-10 BH

Sample Date: Wednesday, June 03, 2015 18:56:27

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	87811.6		ppb
-	Sc	45	354072.8		ppb
>	Rh	103	616605.3		ppb
>	Ho	165	1233064.7		ppb
-	Pb	208	148937.2	3.09445	ppb
	Kr	83	-609.2		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-10 BH

Sample Date: Wednesday, June 03, 2015 18:57:39

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	91086.5		ppb
-	Sc	45	352305.2		ppb
>	Rh	103	610554.1		ppb
>	Ho	165	1217489.6		ppb
-	Pb	208	2423861.5	52.14232	ppb
	Kr	83	-597.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-11 BH

Sample Date: Wednesday, June 03, 2015 18:58:51

Sample Description: Barr

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	88428.9		ppb
-	Sc	45	316027.5		ppb
>	Rh	103	573218		ppb
>	Ho	165	1106266.3		ppb
-	Pb	208	28880.1	0.61189	ppb
	Kr	83	-61.8		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Wednesday, June 03, 2015 19:00:04

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	92849.4		ppb
-	Sc	45	309446.7		ppb
>	Rh	103	570172.7		ppb
>	Ho	165	1083228.2		ppb
-	Pb	208	1812.7	-0.02987	ppb
	Kr	83	53.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Wednesday, June 03, 2015 19:01:16

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	92842.3		ppb
-	Sc	45	321960.3		ppb
>	Rh	103	576628		ppb
>	Ho	165	1097505.7		ppb
-	Pb	208	4248668.7	101.46224	ppb
	Kr	83	-19918.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Thursday, June 04, 2015 08:44:33

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	64352.6		ppb
-	Sc	45	344454.6		ppb
>	Rh	103	607299.7		ppb
>	Ho	165	1051933.6		ppb
-	Pb	208	2251.8	-0.01767	ppb
	Kr	83	70.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Thursday, June 04, 2015 08:46:00

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	66740.7		ppb
-	Sc	45	345493.7		ppb
>	Rh	103	605460.9		ppb
>	Ho	165	1084737.8		ppb
-	Pb	208	3970039.7	95.92248	ppb
	Kr	83	-19852.7		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-10 FH

Sample Date: Thursday, June 04, 2015 08:50:23

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	73868.9		ppb
-	Sc	45	455761.9		ppb
>	Rh	103	579657.2		ppb
>	Ho	165	1039291.9		ppb
-	Pb	208	2259311.1	56.92424	ppb
	Kr	83	-589.2		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-10 FH

Sample Date: Thursday, June 04, 2015 08:51:50

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	77695.6		ppb
-	Sc	45	440948.6		ppb
>	Rh	103	587860.9		ppb
>	Ho	165	1084267.6		ppb
-	Pb	208	4224508.6	102.13576	ppb
	Kr	83	-542.3		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-11 FH

Sample Date: Thursday, June 04, 2015 08:53:17

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	78160.5		ppb
-	Sc	45	674943.1		ppb
>	Rh	103	612097.7		ppb
>	Ho	165	1181284		ppb
-	Pb	208	283889.3	6.23332	ppb
	Kr	83	-3144.7		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Thursday, June 04, 2015 08:59:08

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	70833.8		ppb
-	Sc	45	302537.4		ppb
>	Rh	103	553366.2		ppb
>	Ho	165	1026214.3		ppb
-	Pb	208	10367.7	0.19185	ppb
	Kr	83	49.6		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Thursday, June 04, 2015 09:00:35

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	72436.5		ppb
-	Sc	45	313266.1		ppb
>	Rh	103	564265.8		ppb
>	Ho	165	1062966.8		ppb
-	Pb	208	4072724.6	100.41577	ppb
	Kr	83	-19182.9		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Thursday, June 04, 2015 09:18:42

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	82090.4		ppb
-	Sc	45	299132.2		ppb
>	Rh	103	565661.2		ppb
>	Ho	165	1091200.6		ppb
-	Pb	208	1645.1	-0.03429	ppb
	Kr	83	50.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Thursday, June 04, 2015 09:20:10

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	82460.2		ppb
-	Sc	45	312307.3		ppb
>	Rh	103	580871.4		ppb
>	Ho	165	1092991.2		ppb
-	Pb	208	4186675.2	100.38705	ppb
	Kr	83	-19409.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-8 FH

Sample Date: Thursday, June 04, 2015 09:21:39

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	77526.6		ppb
-	Sc	45	365607.9		ppb
>	Rh	103	519709.5		ppb
>	Ho	165	1044072		ppb
-	Pb	208	2378783.9	59.67927	ppb
	Kr	83	-542.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-9 FH

Sample Date: Thursday, June 04, 2015 09:23:06

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	79181.7		ppb
-	Sc	45	364052.9		ppb
>	Rh	103	515693		ppb
>	Ho	165	1062078.1		ppb
-	Pb	208	2566920.3	63.31302	ppb
	Kr	83	-180.1		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: 24789-9 FH

Sample Date: Thursday, June 04, 2015 09:24:33

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	85200.4		ppb
-	Sc	45	379071.7		ppb
>	Rh	103	556358.3		ppb
>	Ho	165	1166385.4		ppb
-	Pb	208	2577787.5	57.90442	ppb
	Kr	83	-177.4		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 1

Sample Date: Thursday, June 04, 2015 09:30:25

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	75342		ppb
-	Sc	45	270942.8		ppb
>	Rh	103	528420.5		ppb
>	Ho	165	1078908.6		ppb
-	Pb	208	8153.5	0.12449	ppb
	Kr	83	54.2		mg/L

Method 6020 & 200.8 Metals Summary Report

Sample ID: QC Std 4

Sample Date: Thursday, June 04, 2015 09:31:52

Sample Description:

Concentration Results

	Analyte	Mass	Meas. Intens	Conc.	Mear Report Unit
	Li	6	76117.9		ppb
-	Sc	45	284223.2		ppb
>	Rh	103	539433		ppb
>	Ho	165	1104421.5		ppb
-	Pb	208	4285441.1	101.70791	ppb
	Kr	83	-18222.1		mg/L

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
Calib Blank	5/21/2015	11:16:13 AM	6.92E-05			µg			6.51E-05			7.34E-05		
STD1 = .004ug	5/21/2015	11:17:54 AM	0.0014275			µg			0.0014321			0.0014229		
STD2 = .04ug	5/21/2015	11:19:36 AM	0.0147402			µg			0.0146952			0.0147852		
STD3 = .08ug	5/21/2015	11:21:29 AM	0.0307308			µg			0.0306926			0.0307691		
STD4 = .16ug	5/21/2015	11:23:23 AM	0.0550366			µg			0.0551854			0.0548878		
STD5 = .2ug	5/21/2015	11:25:17 AM	0.0684536			µg			0.0682786			0.0686286		
Reagent Blank	5/21/2015	11:27:10 AM	0.0001146	0.0003298	0.0003298	µg			8.35E-05	0.0002403	0.0002403	0.0001457	0.0004193	0.0004193
0.004ug = DL	5/21/2015	11:28:51 AM	0.0013473	0.0038773	0.0038773	µg			0.0013488	0.0038814	0.0038814	0.0013459	0.0038731	0.0038731
0.080ug = QC STD 2	5/21/2015	11:30:33 AM	0.0294738	0.0848179	0.0848179	µg			0.0294316	0.0846966	0.0846966	0.0295159	0.0849391	0.0849391
0.080ug = QC STD 3	5/21/2015	11:32:30 AM	0.0282938	0.0814221	0.0814221	µg			0.0282467	0.0812867	0.0812867	0.0283408	0.0815574	0.0815574
Reagent Blank	5/21/2015	11:34:24 AM	6.32E-05	0.0001818	0.0001818	µg			3.32E-05	9.55E-05	9.55E-05	9.31E-05	0.000268	0.000268
0.004ug = DL	5/21/2015	1:25:46 PM	0.0014829	0.0042674	0.0042674	µg			0.0014828	0.0042672	0.0042672	0.001483	0.0042677	0.0042677
0.080ug = QC STD 2	5/21/2015	1:27:29 PM	0.0285923	0.0822811	0.0822811	µg			0.0284007	0.0817299	0.0817299	0.0287838	0.0828323	0.0828323
Reagent Blank	5/21/2015	1:29:23 PM	1.11E-05	3.21E-05	3.21E-05	µg			1.29E-05	3.70E-05	3.70E-05	9.41E-06	2.71E-05	2.71E-05
24789-1 bh	5/21/2015	1:31:04 PM	0.0015742	0.0042002	0.0435322	µg	4	670	0.001507	0.0040068	0.6711436	0.0016413	0.0043936	0.7359208
24789-2 bh	5/21/2015	1:32:48 PM	0.0021	0.0057133	0.9246958	µg	4	660	0.0020358	0.0055286	0.9122232	0.0021641	0.005898	0.9731685
24789-2 bh dup	5/21/2015	1:34:32 PM	0.0021484	0.0058527	0.9656911	µg	4	660	0.0021322	0.005806	0.9579945	0.0021646	0.0058993	0.9733878
24789-3 bh	5/21/2015	1:36:17 PM	0.0030365	0.0084085	1.3874099	µg	4	660	0.0030195	0.0083594	1.379302	0.0030536	0.0084577	1.3955179
24789-3 bh spk	5/21/2015	1:37:58 PM	0.0314327	0.0914327	14.870696	µg	4	660	0.0312896	0.0897136	14.802745	0.0315758	0.0905373	14.938646
24789-4 bh	5/21/2015	1:39:48 PM	0.0024918	0.0068409	0.8380062	µg	4	490	0.0024215	0.0066386	0.8132269	0.0025621	0.0070431	0.8627854
24789-5 bh	5/21/2015	1:41:26 PM	0.0025678	0.0070597	1.0942513	µg	4	620	0.0025703	0.0070669	1.0953632	0.0025653	0.0070525	1.0931394
24789-5 bh dup	5/21/2015	1:43:06 PM	0.0024225	0.0066417	1.0294574	µg	4	620	0.0023957	0.0065644	1.0174814	0.0024494	0.0067189	1.0414334
24789-6 bh	5/21/2015	1:44:46 PM	0.0024715	0.0067824	0.8647577	µg	4	510	0.0025464	0.0069982	0.8922642	0.0023965	0.0065667	0.8372511
24789-6 bh spk	5/21/2015	1:46:26 PM	0.0312806	0.0896876	11.435169	µg	4	510	0.0311124	0.0892036	11.373455	0.0314488	0.0901716	11.496884
0.004ug = DL	5/21/2015	1:48:17 PM	0.0014779	0.0042529	0.0042529	µg			0.0014759	0.0042472	0.0042472	0.0014798	0.0042586	0.0042586
0.080ug = QC STD 2	5/21/2015	1:50:00 PM	0.0286637	0.0824868	0.0824868	µg			0.0285175	0.0820659	0.0820659	0.02881	0.0829077	0.0829077
Reagent Blank	5/21/2015	1:51:54 PM	3.06E-05	8.82E-05	8.82E-05	µg			2.72E-05	7.84E-05	7.84E-05	3.40E-05	9.80E-05	9.80E-05
24789-7 bh	5/21/2015	1:53:34 PM	8.65E-05	-8.08E-05	-0.0040406	µg	4	200	7.07E-05	-0.0001265	-0.0063233	0.0001024	-3.52E-05	-0.0017579
24789-1a	5/21/2015	1:55:15 PM	0.0001357	6.06E-05	0.0030318	µg	4	200	0.0001192	1.34E-05	0.0006675	0.0001521	0.0001079	0.005396
24789-2a	5/21/2015	1:56:56 PM	0.0001384	6.86E-05	0.0034292	µg	4	200	0.0001197	1.48E-05	0.0007398	0.0001571	0.0001224	0.0061185
24789-2a dup	5/21/2015	1:58:38 PM	0.000104	-3.05E-05	-0.0015232	µg	4	200	0.0001055	-2.62E-05	-0.001312	0.0001026	-3.47E-05	-0.0017344
24789-3a	5/21/2015	2:00:21 PM	0.0001646	0.0001438	0.0071907	µg	4	200	0.0001579	0.0001246	0.0062276	0.0001713	0.0001631	0.0081538
24789-3a spk	5/21/2015	2:02:04 PM	0.0276939	0.0793661	3.9683055	µg	4	200	0.0275763	0.0790276	3.9513796	0.0278116	0.0797046	3.9852315
24789-4a	5/21/2015	2:03:58 PM	0.0001953	0.0002322	0.0116084	µg	4	200	0.0001844	0.0002008	0.0100417	0.0002062	0.0002635	0.0131751
24789-6a	5/21/2015	2:05:42 PM	0.0002999	0.0005333	0.0266643	µg	4	200	0.0003028	0.0005415	0.0270757	0.0002971	0.0005251	0.0262528
24789-6a spk	5/21/2015	2:07:27 PM	0.0271257	0.077731	3.8865518	µg	4	200	0.0269566	0.0772444	3.862219	0.0272949	0.0782177	3.9108845
24789-7a	5/21/2015	2:09:18 PM	4.52E-05	-0.0001996	-0.0099794	µg	4	200	6.72E-05	-0.0001364	-0.0068194	2.33E-05	-0.0002628	-0.0131394
0.004ug = DL	5/21/2015	2:10:57 PM	0.0014798	0.0042584	0.0042584	µg			0.0014627	0.0042093	0.0042093	0.0014968	0.0043075	0.0043075
0.080ug = QC STD 2	5/21/2015	2:12:41 PM	0.028355	0.0815984	0.0815984	µg			0.0282447	0.0812811	0.0812811	0.0284653	0.0819157	0.0819157
Reagent Blank	5/21/2015	2:14:34 PM	2.28E-05	6.56E-05	6.56E-05	µg			3.43E-05	9.87E-05	9.87E-05	1.13E-05	3.25E-05	3.25E-05
Calib Blank	5/27/2015	11:13:16 AM	0.0001062			µg			9.51E-05			0.0001172		
STD1 = .004ug	5/27/2015	11:14:56 AM	0.0013268			µg			0.0013411			0.0013125		
STD2 = .04ug	5/27/2015	11:16:37 AM	0.0130937			µg			0.0131103			0.013077		
STD3 = .08ug	5/27/2015	11:18:31 AM	0.0255827			µg			0.0254472			0.0257182		
STD4 = .16ug	5/27/2015	11:20:25 AM	0.0510643			µg			0.0508352			0.0512935		
STD5 = .2ug	5/27/2015	11:22:20 AM	0.0632425			µg			0.0628472			0.0636379		
Reagent Blank	5/27/2015	11:24:14 AM	-1.23E-05	-3.86E-05	-3.86E-05	µg			-5.28E-06	-1.66E-05	-1.66E-05	-1.92E-05	-6.05E-05	-6.05E-05
0.004ug = DL	5/27/2015	11:25:54 AM	0.0012046	0.0037903	0.0037903	µg			0.0012017	0.0037814	0.0037814	0.0012074	0.0037992	0.0037992
0.080ug = QC STD 2	5/27/2015	11:27:38 AM	0.0258012	0.0811858	0.0811858	µg			0.0257391	0.0809903	0.0809903	0.0258633	0.0813813	0.0813813
Reagent Blank	5/27/2015	11:29:31 AM	-3.68E-05	-0.0001157	-0.0001157	µg			-2.75E-05	-8.65E-05	-8.65E-05	-4.60E-05	-0.0001448	-0.0001448
0.004ug = DL	5/27/2015	11:48:10 AM	0.0012276	0.0038629	0.0038629	µg			0.0012263	0.0038588	0.0038588	0.001229	0.0038671	0.0038671
0.080ug = QC STD 2	5/27/2015	11:49:54 AM	0.0257577	0.081049	0.081049	µg			0.0256393	0.0806763	0.0806763	0.0258762	0.0814217	0.0814217
Reagent Blank	5/27/2015	11:51:48 AM	-1.67E-05	-5.26E-05	-5.26E-05	µg			-2.52E-05	-7.93E-05	-7.93E-05	-8.26E-06	-2.60E-05	-2.60E-05
24789- 1B	5/27/2015	12:03:51 PM	0.0022666	0.0071705	0.8963096	µg	4	500	0.0022471	0.0071091	0.8886387	0.0022861	0.0072318	0.9039805
24789- 2B	5/27/2015	12:05:30 PM	0.0020559	0.0065077	0.8134563	µg	4	500	0.0020768	0.0065735	0.8216865	0.002035	0.0064418	0.8052261
24789- 2B DUP	5/27/2015	12:07:10 PM	0.0021844	0.0069121	0.8640081	µg	4	500	0.0021807	0.0069003	0.8625415	0.0021882	0.0069238	0.8654746
24789- 3B	5/27/2015	12:08:50 PM	0.0026352	0.0083305	1.0413182	µg	4	500	0.0026014	0.0082241	1.0280129	0.0026691	0.008437	1.0546235
0.004ug = DL	5/27/2015	12:10:31 PM	0.0012817	0.0040331	0.0040331	µg			0.0013225	0.0041614	0.0041614	0.0012409	0.0039047	0.0039047
0.080ug = QC STD 2	5/27/2015	12:12:15 PM	0.0256151	0.0806001	0.0806001	µg			0.025504	0.0802506	0.0802506	0.0257262	0.0809497	0.0809497
Reagent Blank	5/27/2015	12:14:08 PM	-2.24E-05	-7.03E-05	-7.03E-05	µg			-2.89E-05	-9.11E-05	-9.11E-05	-1.58E-05	-4.96E-05	-4.96E-05
24789- 3B SPK	5/27/2015	12:15:49 PM	0.0266094	0.0837676	10.470945	µg	4	500	0.0264509	0.0832687	10.408583	0.026768	0.0842665	10.533307
24789- 4B	5/27/2015	12:17:40 PM	0.0013669	0.0043396	0.5424501	µg	4	500	0.0013127	0.0041691	0.5211414	0.0014211	0.0045101	0.5637589
24789- 5B	5/27/2015	12:19:21 PM	0.0017774	0.0056312	0.703899	µg	4	500	0.0017919	0.0056769	0.7096183	0.0017628	0.0055854	0.6981797
24789- 5B DUP	5/27/2015	12:21:04 PM	0.0018375	0.0058204	0.727556	µg	4	500	0.0017854	0.0056565	0.7070599	0.0018896	0.0059844	0.7480522
24789- 6B	5/27/2015	12:22:46 PM	0.0018067	0.0057235	0.7154328	µg	4	500	0.0017887	0.0056669	0.7083624	0.0018247	0.005578	0.7225033
24789- 6B SPK	5/27/2015	12:24:30 PM	0.0259504	0.0816938	10.211721	µg	4	500	0.0259181	0.0815922	10.199026	0.0259827	0.0817953	10.224416
24789- 7B	5/27/2015	12:26:24 PM	3.54E-05	0.0001498	0.0187292	µg	4	500	3.75E-05	0.0001564	0.019555	3.33E-05	0.0001432	0.0179035
0.004ug = DL	5/27/2015	12:33:23 PM	0.0013315	0.0041897	0.0041897	µg			0.0013422	0.0042235	0.0042235	0.0013208	0.004156	0.004156
0.080ug = QC STD 2	5/27/2015	12:35:06 PM	0.0253362	0.0797228	0.0797228	µg			0.					

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
0.080ug = QC STD 2	5/28/2015	11:32:23 AM	0.0265727	0.0769432	0.0769432	µg			0.0265346	0.0768328	0.0768328	0.0266108	0.0770536	0.0770536
0.080ug = QC STD 3	5/28/2015	11:34:20 AM	0.0267456	0.077444	0.077444	µg			0.02667	0.0772251	0.0772251	0.0268212	0.0776629	0.0776629
Reagent Blank	5/28/2015	11:36:14 AM	-0.0002847	-0.0008243	-0.0008243	µg			-0.0003383	-0.0009795	-0.0009795	-0.0002311	-0.0006691	-0.0006691
0.004ug = DL	5/28/2015	1:48:01 PM	0.0013422	0.0038864	0.0038864	µg			0.0013694	0.0039653	0.0039653	0.0013149	0.0038074	0.0038074
0.080ug = QC STD 2	5/28/2015	1:49:45 PM	0.0291181	0.0843137	0.0843137	µg			0.02913	0.0843482	0.0843482	0.0291062	0.0842792	0.0842792
Reagent Blank	5/28/2015	1:51:39 PM	-0.0001344	-0.0003892	-0.0003892	µg			-0.0001797	-0.0005202	-0.0005202	-8.91E-05	-0.0002581	-0.0002581
24789- 1C	5/28/2015	1:56:42 PM	0.0164356	0.04817	4.8170006	µg	4	400	0.0165545	0.0485143	4.851431	0.0163167	0.0478257	4.7825703
24789- 2C	5/28/2015	1:58:34 PM	0.0149488	0.0438648	4.3864824	µg	4	400	0.0149932	0.0439934	4.3993373	0.0149044	0.0437363	4.3736275
24789- 2C DUP	5/28/2015	2:00:28 PM	0.0168561	0.0493873	4.9387349	µg	4	400	0.0166793	0.0488755	4.8875522	0.0170328	0.0498992	4.9899177
24789- 3C	5/28/2015	2:02:22 PM	0.0157516	0.0461892	4.6189226	µg	4	400	0.0157084	0.0460642	4.6064191	0.0157947	0.0463143	4.6314261
24789- 3C SPK	5/28/2015	2:04:16 PM	0.0407202	0.1184877	11.848767	µg	4	400	0.0408249	0.1187908	11.879084	0.0406155	0.1181845	11.81845
24789- 4C	5/28/2015	2:06:12 PM	0.0125737	0.0369873	3.6987337	µg	4	400	0.0124822	0.0367224	3.6722442	0.0126651	0.0372522	3.7252233
24789- 5C	5/28/2015	2:08:07 PM	0.0137127	0.0402854	4.0285419	µg	4	400	0.0137312	0.0403392	4.0339163	0.0136941	0.0402317	4.0231676
24789- 5C DUP	5/28/2015	2:09:58 PM	0.0139608	0.041004	4.1003981	µg	4	400	0.0139321	0.040921	4.092096	0.0139895	0.041087	4.1087002
0.004ug = DL	5/28/2015	2:11:48 PM	0.0014403	0.0041706	0.0041706	µg			0.0014526	0.004206	0.004206	0.0014281	0.0041352	0.0041352
0.080ug = QC STD 2	5/28/2015	2:13:32 PM	0.029123	0.0843277	0.0843277	µg			0.0290955	0.0842482	0.0842482	0.0291504	0.0844073	0.0844073
Reagent Blank	5/28/2015	2:15:26 PM	-3.32E-05	-9.60E-05	-9.60E-05	µg			-0.0001266	-0.0003666	-0.0003666	6.03E-05	0.0001745	0.0001745
24789- 6C	5/28/2015	2:17:05 PM	0.0140352	0.0412195	4.1219457	µg	4	400	0.0140018	0.0411228	4.1122751	0.0140686	0.0413162	4.1316163
24789- 6C SPK	5/28/2015	2:18:54 PM	0.0393035	0.1143856	11.438562	µg	4	400	0.03954	0.1150705	11.507045	0.039067	0.1137008	11.370078
24789- 7C	5/28/2015	2:20:44 PM	-1.02E-05	0.0005498	0.0549827	µg	4	400	-7.22E-05	0.0003704	0.0370374	5.18E-05	0.0007293	0.072928
0.004ug = DL	5/28/2015	2:34:23 PM	0.0013295	0.0038498	0.0038498	µg			0.0013216	0.0038267	0.0038267	0.0013375	0.0038728	0.0038728
0.080ug = QC STD 2	5/28/2015	2:36:06 PM	0.0288246	0.0834639	0.0834639	µg			0.0287662	0.0832946	0.0832946	0.0288831	0.0836331	0.0836331
Reagent Blank	5/28/2015	2:37:59 PM	-8.71E-05	-0.0002522	-0.0002522	µg			-3.42E-05	-9.91E-05	-9.91E-05	-0.00014	-0.0004052	-0.0004052
Calib Blank	5/29/2015	12:54:06 PM	0.0001687			µg			6.72E-05			0.0002702		
STD1 = .004ug	5/29/2015	12:55:46 PM	0.0011657			µg			0.0011921			0.0011393		
STD2 = .04ug	5/29/2015	12:57:27 PM	0.0111305			µg			0.0111596			0.0111015		
STD3 = .08ug	5/29/2015	12:59:20 PM	0.0222553			µg			0.0221614			0.0223491		
STD4 = .16ug	5/29/2015	1:01:15 PM	0.0483934			µg			0.048395			0.0483919		
STD5 = .2ug	5/29/2015	1:03:10 PM	0.0603524			µg			0.0601613			0.0605435		
Reagent Blank	5/29/2015	1:05:03 PM	-5.00E-05	-0.0001669	-0.0001669	µg			-5.69E-05	-0.00019	-0.00019	-4.31E-05	-0.0001437	-0.0001437
0.004ug = DL	5/29/2015	1:06:44 PM	0.0012837	0.0042843	0.0042843	µg			0.0013114	0.0043766	0.0043766	0.001256	0.0041919	0.0041919
0.080ug = QC STD 2	5/29/2015	1:08:28 PM	0.0248302	0.0828705	0.0828705	µg			0.0248119	0.0828094	0.0828094	0.0248485	0.0829315	0.0829315
0.080ug = QC STD 3	5/29/2015	1:10:24 PM	0.0245783	0.0820299	0.0820299	µg			0.0244762	0.0816893	0.0816893	0.0246804	0.0823706	0.0823706
Reagent Blank	5/29/2015	1:12:18 PM	-0.0001101	-0.0003676	-0.0003676	µg			-0.0001515	-0.0005056	-0.0005056	-6.88E-05	-0.0002297	-0.0002297
24789- LRB FH	5/29/2015	1:24:38 PM	2.01E-06	0.0001736	0.0043393	µg	4	100	1.01E-05	0.0002005	0.0050134	-6.07E-06	0.0001466	0.0036653
24789- LRB FH SPK	5/29/2015	1:26:19 PM	0.0244413	0.0817393	5.1087085	µg	1.6	100	0.0246266	0.0823578	5.1473656	0.0242559	0.0811208	5.0700515
24789- 1 FH	5/29/2015	1:28:11 PM	0.034786	0.1162648	2.9066197	µg	4	100	0.0348401	0.1164453	2.9111318	0.0347319	0.1160843	2.9021076
24789- 2 FH	5/29/2015	1:30:05 PM	0.0070995	0.0238614	0.5965346	µg	4	100	0.00707947	0.0238454	0.5961356	0.0071043	0.0238773	0.5969336
0.004ug = DL	5/29/2015	1:31:46 PM	0.0012437	0.0041509	0.0041509	µg			0.0012564	0.0041931	0.0041931	0.001231	0.0041086	0.0041086
0.080ug = QC STD 2	5/29/2015	1:33:30 PM	0.0246945	0.0824177	0.0824177	µg			0.0248386	0.0828986	0.0828986	0.0245504	0.0819369	0.0819369
Reagent Blank	5/29/2015	1:35:23 PM	1.77E-05	5.92E-05	5.92E-05	µg			7.30E-05	0.0002436	0.0002436	-3.76E-05	-0.0001253	-0.0001253
24789- 2 FH DUP	5/29/2015	1:37:05 PM	0.0068671	0.0230857	0.5771431	µg	4	100	0.0068303	0.0229629	0.5740722	0.0069039	0.0232086	0.5802139
24789- 3 FH	5/29/2015	1:38:48 PM	0.0032098	0.0108796	0.2719898	µg	4	100	0.0032286	0.0109421	0.2735536	0.0031911	0.010817	0.2704259
24789- 3 FH SPK	5/29/2015	1:40:31 PM	0.0315701	0.1055316	2.6382911	µg	4	100	0.0315114	0.105336	2.6334011	0.0316287	0.1057272	2.643181
24789- 4 FH	5/29/2015	1:42:26 PM	0.0052205	0.0175904	0.4397593	µg	4	100	0.0051835	0.0174666	0.4366652	0.0052576	0.0177141	0.4428534
24789- 5 FH	5/29/2015	1:44:11 PM	0.0052626	0.0177307	0.443268	µg	4	100	0.0052609	0.0177251	0.4431276	0.0052643	0.0177363	0.4434083
24789- 5 FH DUP	5/29/2015	1:45:52 PM	0.0050618	0.0170606	0.4265157	µg	4	100	0.0050772	0.017112	0.4278003	0.0050464	0.0170092	0.425231
24789- 7 FH	5/29/2015	1:50:59 PM	-4.40E-05	2.02E-05	0.0005041	µg	4	100	-5.89E-05	-2.96E-05	-0.0007389	-2.91E-05	6.99E-05	0.0017471
0.004ug = DL	5/29/2015	1:54:19 PM	0.0012108	0.0040411	0.0040411	µg			0.0012098	0.0040376	0.0040376	0.0012119	0.0040447	0.0040447
0.080ug = QC STD 2	5/29/2015	1:56:02 PM	0.0247021	0.0824432	0.0824432	µg			0.0248584	0.0829648	0.0829648	0.0245459	0.0819217	0.0819217
Reagent Blank	5/29/2015	1:57:56 PM	-3.99E-05	-0.0001332	-0.0001332	µg			-2.70E-05	-9.00E-05	-9.00E-05	-5.29E-05	-0.0001764	-0.0001764
Calib Blank	6/1/2015	11:37:56 AM	0.0001796			µg			0.0002132			0.0001461		
STD1 = .004ug	6/1/2015	11:39:37 AM	0.0013449			µg			0.0013452			0.0013446		
STD2 = .04ug	6/1/2015	11:41:18 AM	0.0127647			µg			0.0128208			0.0127085		
STD3 = .08ug	6/1/2015	11:43:11 AM	0.0253676			µg			0.0252529			0.0254822		
STD4 = .16ug	6/1/2015	11:45:05 AM	0.0527315			µg			0.0527898			0.0526733		
STD5 = .2ug	6/1/2015	11:47:00 AM	0.0647306			µg			0.0648799			0.0645812		
Reagent Blank	6/1/2015	11:48:53 AM	-2.63E-05	-8.08E-05	-8.08E-05	µg			-1.49E-05	-4.59E-05	-4.59E-05	-3.76E-05	-0.0001157	-0.0001157
0.004ug = DL	6/1/2015	11:50:34 AM	0.0012752	0.0039226	0.0039226	µg			0.0012812	0.003941	0.003941	0.0012692	0.0039043	0.0039043
0.080ug = QC STD 2	6/1/2015	11:52:17 AM	0.0260418	0.0801064	0.0801064	µg			0.0260112	0.0800125	0.0800125	0.0260723	0.0802004	0.0802004
0.080ug = QC STD 3	6/1/2015	11:54:14 AM	0.0260118	0.0800144	0.0800144	µg			0.0260685	0.0801887	0.0801887	0.0259552	0.07984	0.07984
Reagent Blank	6/1/2015	11:56:08 AM	-3.31E-05	-0.0001019	-0.0001019	µg			-9.76E-06	-3.00E-05	-3.00E-05	-5.65E-05	-0.0001739	-0.0001739
0.004ug = DL	6/1/2015	2:32:19 PM	0.0013103	0.0040306	0.0040306	µg			0.0013083	0.0040246	0.0040246	0.0013123	0.0040366	0.0040366
0.080ug = QC STD 2	6/1/2015	2:34:03 PM	0.0262237	0.0806661	0.0806661	µg			0.0261734	0.0805114	0.0805114	0.026274	0.0808208	0.0808208
Reagent Blank	6/1/2015	2:35:56 PM	3.97E-05	0.0001221	0.0001221	µg			3.36E-05	0.0001033	0.0001033	4.58E-05	0.0001409	0.0001409
24789- 8 BH	6/1/2015	2:53:32 PM	0.0034927	0.0108245	1.2448156	µg	4	460	0.0034815	0.0107902	1.2408772	0.0035038	0.0108587	1.248754
0.004ug = DL	6/1/2015	2:55:13 PM	0.0012499	0.0038447	0.0038447	µg			0.0012445	0.0038282	0.0038282	0.0012552	0.0038612	0.0038612
0.080ug = QC STD 2	6/1/2015	2:56:56 PM	0.0260776	0.0802165	0.0802165	µg			0.0260117	0.080014	0.080014	0.0261434	0.0804189	0.0804189
Reagent Blank	6/1/2015	2:58:50 PM	-1.84E-05	-5.66E-05	-5.66E-05	µg			-3.29E-06	-1.01E-05	-1.01E-05	-3.35E-05	-0.0001031	-

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
0.080ug = QC STD 2	6/1/2015	3:19:18 PM	0.0260004	0.079979	0.079979	µg			0.0260184	0.0800344	0.0800344	0.0259824	0.0799237	0.0799237
Reagent Blank	6/1/2015	3:21:11 PM	1.17E-05	3.61E-05	3.61E-05	µg			2.68E-06	8.25E-06	8.25E-06	2.08E-05	6.40E-05	6.40E-05
24789- 11A	6/1/2015	3:22:52 PM	-4.92E-06	6.57E-05	0.0032839	µg			-1.74E-05	2.72E-05	0.0013603	7.59E-06	0.0001041	0.0052075
24789- 6 FH	6/1/2015	3:27:57 PM	0.0024526	0.0076253	0.190632	µg	4	100	0.0024379	0.0075798	0.0075798	0.0024674	0.0076707	0.191768
24789- 6 FH SPK	6/1/2015	3:29:39 PM	0.0294316	0.0906145	2.2653615	µg	4	100	0.0294992	0.0908226	2.2705655	0.0293639	0.0904063	2.2601576
0.004ug = DL	6/1/2015	3:34:58 PM	0.001242	0.0038204	0.0038204	µg			0.0012288	0.0037798	0.0037798	0.0012552	0.0038611	0.0038611
0.080ug = QC STD 3	6/1/2015	3:36:42 PM	0.0258669	0.0795684	0.0795684	µg			0.0257896	0.0793308	0.0793308	0.0259441	0.079806	0.079806
Reagent Blank	6/1/2015	3:38:36 PM	-4.37E-07	-1.34E-06	-1.34E-06	µg			6.05E-06	1.86E-05	1.86E-05	-6.92E-06	-2.13E-05	-2.13E-05
Calib Blank	6/2/2015	1:31:18 PM	0.0002042			µg			0.0001995			0.0002088		
STD1 = .004ug	6/2/2015	1:32:59 PM	0.0012648			µg			0.0012646			0.001265		
STD2 = .04ug	6/2/2015	1:34:40 PM	0.014712			µg			0.0146315			0.0147926		
STD3 = .08ug	6/2/2015	1:36:33 PM	0.0260068			µg			0.0261265			0.0258871		
STD4 = .16ug	6/2/2015	1:38:27 PM	0.0511777			µg			0.0511551			0.0512002		
STD5 = .2ug	6/2/2015	1:40:22 PM	0.0632722			µg			0.0631299			0.0634145		
Reagent Blank	6/2/2015	1:42:15 PM	-2.35E-05	-7.36E-05	-7.36E-05	µg			-2.87E-05	-8.99E-05	-8.99E-05	-1.83E-05	-5.73E-05	-5.73E-05
0.004ug = DL	6/2/2015	1:43:55 PM	0.0012358	0.0038663	0.0038663	µg			0.0012256	0.0038342	0.0038342	0.0012461	0.0038984	0.0038984
0.080ug = QC STD 2	6/2/2015	1:45:38 PM	0.0256988	0.0803997	0.0803997	µg			0.0257534	0.0805704	0.0805704	0.0256443	0.080229	0.080229
Reagent Blank	6/2/2015	1:47:32 PM	-1.92E-05	-6.00E-05	-6.00E-05	µg			-7.13E-06	-2.23E-05	-2.23E-05	-3.12E-05	-9.77E-05	-9.77E-05
0.004ug = DL	6/2/2015	2:06:36 PM	0.001258	0.0039358	0.0039358	µg			0.0012657	0.0039598	0.0039598	0.0012504	0.0039118	0.0039118
0.080ug = QC STD 2	6/2/2015	2:08:19 PM	0.0256052	0.0801068	0.0801068	µg			0.0256826	0.0803489	0.0803489	0.0255278	0.0798647	0.0798647
Reagent Blank	6/2/2015	2:10:13 PM	-1.83E-06	-5.73E-06	-5.73E-06	µg			8.05E-06	2.52E-05	2.52E-05	-1.17E-05	-3.67E-05	-3.67E-05
24789-8B	6/2/2015	2:15:09 PM	0.0008482	0.0027272	0.3408942	µg	4	500	0.0008565	0.0027532	0.3441506	0.0008398	0.0027011	0.3376378
24789-9B	6/2/2015	2:16:48 PM	0.0017624	0.0055873	0.6984112	µg	4	500	0.0017745	0.0056251	0.7031381	0.0017503	0.0055495	0.6936843
24789-9B DUP	6/2/2015	2:18:28 PM	0.0018742	0.0059372	0.742149	µg	4	500	0.0018885	0.005982	0.7477466	0.0018599	0.0058924	0.7365514
24789-10B	6/2/2015	2:20:09 PM	0.00634	0.0199086	2.4885811	µg	4	500	0.0063591	0.0199682	2.4960226	0.006321	0.0198491	2.4811396
24789-10B SPK	6/2/2015	2:21:50 PM	0.0309045	0.0967595	12.094937	µg	4	500	0.0311631	0.0975686	12.196073	0.0306459	0.0959504	11.993801
24789-11B	6/2/2015	2:23:42 PM	-3.59E-07	7.25E-05	0.0090618	µg	4	500	6.94E-06	9.53E-05	0.0119159	-7.66E-06	4.97E-05	0.0062077
0.004ug = DL	6/2/2015	2:29:10 PM	0.0012754	0.0039901	0.0039901	µg			0.0012853	0.004021	0.004021	0.0012655	0.0039592	0.0039592
0.080ug = QC STD 2	6/2/2015	2:30:53 PM	0.0253405	0.0792787	0.0792787	µg			0.0255392	0.0799002	0.0799002	0.0251419	0.0786573	0.0786573
Reagent Blank	6/2/2015	2:32:46 PM	-4.10E-06	-1.28E-05	-1.28E-05	µg			-1.44E-05	-4.52E-05	-4.52E-05	6.23E-06	1.95E-05	1.95E-05
0.004ug = DL	6/2/2015	2:52:26 PM	0.0013198	0.0041292	0.0041292	µg			0.0013218	0.0041352	0.0041352	0.0013179	0.0041231	0.0041231
0.080ug = QC STD 2	6/2/2015	2:54:09 PM	0.0254836	0.0797265	0.0797265	µg			0.0257909	0.0806878	0.0806878	0.0251764	0.0787652	0.0787652
Reagent Blank	6/2/2015	2:56:02 PM	2.18E-06	6.81E-06	6.81E-06	µg			-6.85E-06	-2.14E-05	-2.14E-05	1.12E-05	3.51E-05	3.51E-05
24789-9 BH	6/2/2015	3:01:17 PM	0.004419	0.0138985	1.5983289	µg	4	460	0.0045669	0.0143614	1.6515597	0.004271	0.0134356	1.5450981
24789-9 BH DUP	6/2/2015	3:02:59 PM	0.0043757	0.0137633	1.5827742	µg	4	460	0.0045008	0.0141546	1.6277774	0.0042506	0.0133719	1.5377709
0.004ug = DL	6/2/2015	3:08:16 PM	0.001312	0.0041047	0.0041047	µg			0.0013266	0.0041503	0.0041503	0.0012974	0.004059	0.004059
0.080ug = QC STD 3	6/2/2015	3:10:00 PM	0.0273753	0.0856446	0.0856446	µg			0.0274957	0.0860213	0.0860213	0.0272549	0.0852679	0.0852679
Reagent Blank	6/2/2015	3:11:54 PM	-8.50E-06	-2.66E-05	-2.66E-05	µg			-7.66E-06	-2.40E-05	-2.40E-05	-9.34E-06	-2.92E-05	-2.92E-05
Calib Blank	6/3/2015	1:50:11 PM	0.0001371			µg			0.0001321			0.0001421		
STD 1= .004 ug	6/3/2015	1:51:51 PM	0.0011352			µg			0.0011432			0.0011271		
STD 2= .04 ug	6/3/2015	1:53:33 PM	0.0112359			µg			0.0112125			0.0112594		
STD 3= .08 ug	6/3/2015	1:55:27 PM	0.0248072			µg			0.0248478			0.0247665		
STD 4= .16 ug	6/3/2015	1:57:21 PM	0.0460979			µg			0.0462851			0.0459107		
STD 5= .20 ug	6/3/2015	1:59:16 PM	0.0578789			µg			0.0577064			0.0580514		
Reagent Blank	6/3/2015	2:01:08 PM	-0.61E-05	-8.99E-05	-8.99E-05	µg			-1.99E-05	-6.84E-05	-6.84E-05	-3.24E-05	-0.0001115	-0.0001115
0.004ug = DL	6/3/2015	2:02:49 PM	0.0011125	0.0038272	0.0038272	µg			0.0010931	0.0037602	0.0037602	0.001132	0.0038942	0.0038942
0.080ug = QC STD 2	6/3/2015	2:04:32 PM	0.0236726	0.0814351	0.0814351	µg			0.0236804	0.0814618	0.0814618	0.0236648	0.0814084	0.0814084
Reagent Blank	6/3/2015	2:06:26 PM	-6.57E-06	-2.26E-05	-2.26E-05	µg			-2.24E-05	-7.69E-05	-7.69E-05	9.22E-06	3.17E-05	3.17E-05
0.004ug = DL	6/3/2015	2:26:38 PM	0.0011186	0.0038481	0.0038481	µg			0.0011272	0.0038777	0.0038777	0.00111	0.0038186	0.0038186
0.080ug = QC STD 2	6/3/2015	2:28:21 PM	0.0233774	0.0804195	0.0804195	µg			0.0233808	0.0804314	0.0804314	0.0233739	0.0804076	0.0804076
Reagent Blank	6/3/2015	2:30:14 PM	-2.95E-05	-0.0001016	-0.0001016	µg			-1.60E-05	-5.51E-05	-5.51E-05	-4.31E-05	-0.0001481	-0.0001481
24789-8 C	6/3/2015	2:42:52 PM	0.0135518	0.0467088	4.6708833	µg	4	400	0.0134483	0.0463529	4.6352877	0.0136552	0.0470648	4.7064788
24789-9 C	6/3/2015	2:44:43 PM	0.0136296	0.0469765	4.6976506	µg	4	400	0.0135559	0.046723	4.6723035	0.0137033	0.04723	4.7229977
24789-9 C DUP	6/3/2015	2:46:34 PM	0.01418	0.0488701	4.8870117	µg	4	400	0.0141776	0.0488616	4.8861646	0.0141825	0.0488786	4.8878589
24789-10 C	6/3/2015	2:48:25 PM	0.0111396	0.0384106	3.8410638	µg	4	400	0.0111382	0.0384059	3.8405895	0.0111409	0.0384154	3.841538
0.004ug = DL	6/3/2015	2:50:16 PM	0.0010642	0.0036608	0.0036608	µg			0.0010505	0.0036138	0.0036138	0.0010778	0.0037078	0.0037078
0.080ug = QC STD 2	6/3/2015	2:52:00 PM	0.0230279	0.0792173	0.0792173	µg			0.0231001	0.0794657	0.0794657	0.0229557	0.0789689	0.0789689
Reagent Blank	6/3/2015	2:53:54 PM	-2.76E-06	-9.48E-06	-9.48E-06	µg			-1.00E-05	-3.45E-05	-3.45E-05	4.52E-06	1.56E-05	1.56E-05
24789-10 C SPK	6/3/2015	2:55:34 PM	0.0323998	0.1115471	11.15471	µg	4	400	0.0326593	0.11244	11.243996	0.0321402	0.1106542	11.065424
24789-11 C	6/3/2015	2:57:26 PM	-8.00E-06	6.24E-05	0.0062429	µg	4	400	-2.51E-06	8.13E-05	0.0081315	-1.35E-05	4.35E-05	0.0043543
0.004ug = DL	6/3/2015	2:59:07 PM	0.0010836	0.0037275	0.0037275	µg			0.0010721	0.0036881	0.0036881	0.001095	0.003767	0.003767
0.080ug = QC STD 3	6/3/2015	3:00:51 PM	0.0232792	0.0800819	0.0800819	µg			0.0232031	0.07982	0.07982	0.0233553	0.0803437	0.0803437
Reagent Blank	6/3/2015	3:02:45 PM	-6.85E-06	-2.36E-05	-2.36E-05	µg			-3.72E-06	-1.28E-05	-1.28E-05	-9.97E-06	-3.43E-05	-3.43E-05
Calib Blank	6/4/2015	12:52:42 PM	6.76E-05			µg			7.08E-05			6.45E-05		
STD 1= .004 ug	6/4/2015	12:54:23 PM	0.0012466			µg			0.0012299			0.0012633		
STD 2= .04 ug	6/4/2015	12:56:04 PM	0.0132623			µg			0.013259			0.0132657		
STD 3= .08 ug	6/4/2015	12:57:57 PM	0.0272464			µg			0.027119			0.0273739		
STD 4= .16 ug	6/4/2015	12:59:51 PM	0.0542719			µg			0.0542867			0.054257		
STD 5= .20 ug	6/4/2015	1:01:46 PM	0.0672402			µg			0.0672119			0.0672685		
Reagent Blank	6/4/2015	1:03:39 PM	8.78E-06	2.60E-05	2.60E-05	µg			1.51E-05	4.49E-05	4.49E-05	2.42E-06	7.16E-06	7.16E-06
0.004ug = DL	6/4/2015	1:05:20 PM	0.0014316	0.0042415	0.0042415	µg			0.0014517	0.004301	0.004301	0.0014116	0.0041821	0.0041821
0.080ug = QC STD 2	6/4/2015	1:07:03 PM	0.026733	0.0792022	0.0792022	µg			0.0265577	0.0786829	0.0786829	0.0269083	0.0797216	0.0797216
0.														

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
24789- LRB FH SPK	6/4/2015	1:35:16 PM	0.0282353	0.0836271	5.2266908	µg	1.6	100	0.0281066	0.0832458	5.2028606	0.028364	0.0840083	5.250521
24789- 8 FH	6/4/2015	1:37:05 PM	0.0040566	0.0119926	0.2998153	µg	4	100	0.0040465	0.0119625	0.2990619	0.0040668	0.0120228	0.3005688
24789- 11 FH	6/4/2015	1:38:44 PM	0.0001503	0.0004194	0.0104845	µg	4	100	0.0001458	0.0004059	0.0101467	0.0001549	0.0004329	0.0108224
24789- 11 FH DUP	6/4/2015	1:40:23 PM	0.0002338	0.0006668	0.0166691	µg	4	100	0.0002495	0.0007131	0.0178283	0.0002182	0.0006204	0.0155098
24789- 10 FH	6/4/2015	1:42:04 PM	0.0035414	0.0104663	0.2616564	µg	4	100	0.0035283	0.0104273	0.2606819	0.0035546	0.0105052	0.2626309
24789- 10 FH SPK	6/4/2015	1:43:44 PM	0.0362895	0.1074893	2.6872333	µg	4	100	0.036217	0.1072743	2.6818587	0.0363621	0.1077043	2.6926078
0.004ug = DL	6/4/2015	1:52:44 PM	0.0014638	0.0043368	0.0043368	µg			0.0014732	0.0043647	0.0043647	0.0014544	0.0043088	0.0043088
0.080ug = QC STD 2	6/4/2015	1:54:27 PM	0.0271057	0.0803063	0.0803063	µg			0.0268706	0.0796097	0.0796097	0.0273408	0.081003	0.081003
Reagent Blank	6/4/2015	1:56:21 PM	1.52E-05	4.50E-05	4.50E-05	µg			3.33E-05	9.88E-05	9.88E-05	-2.93E-06	-8.68E-06	-8.68E-06
Calib Blank	6/10/2015	10:41:55 AM	0.0004672			µg			0.0005911			0.0003433		
STD1 = .004ug	6/10/2015	10:43:35 AM	0.0012826			µg			0.0012925			0.0012728		
STD2 = .04ug	6/10/2015	10:45:17 AM	0.0123248			µg			0.0122608			0.0123887		
STD3 = .08ug	6/10/2015	10:47:09 AM	0.0248878			µg			0.0247513			0.0250243		
STD4 = .16ug	6/10/2015	10:49:03 AM	0.0495506			µg			0.0493186			0.0497827		
STD5 = .2ug	6/10/2015	10:50:58 AM	0.0612844			µg			0.0610018			0.0615671		
Reagent Blank	6/10/2015	10:52:51 AM	9.77E-05	0.0003173	0.0003173	µg			0.0001121	0.0003639	0.0003639	8.34E-05	0.0002707	0.0002707
0.004ug = DL	6/10/2015	10:56:13 AM	0.0011148	0.0036192	0.0036192	µg			0.0010207	0.0033137	0.0033137	0.0012088	0.0039246	0.0039246
0.080ug = QC STD 2	6/10/2015	10:57:56 AM	0.0257506	0.0836016	0.0836016	µg			0.025773	0.0836743	0.0836743	0.0257282	0.0835288	0.0835288
0.080ug = QC STD 3	6/10/2015	10:59:53 AM	0.0251064	0.0815102	0.0815102	µg			0.0250464	0.0813154	0.0813154	0.0251664	0.0817049	0.0817049
Reagent Blank	6/10/2015	11:01:48 AM	9.25E-05	0.0003003	0.0003003	µg			0.0001845	0.0005989	0.0005989	4.95E-07	1.61E-06	1.61E-06
24789-9 FH	6/10/2015	11:03:29 AM	0.0051254	0.0163227	0.4080676	µg	4	100	0.0051697	0.0164665	0.4116617	0.0050811	0.0161789	0.4044735
24789-9 FH DUP	6/10/2015	11:05:12 AM	0.0045832	0.0145625	0.3640616	µg	4	100	0.0046051	0.0146335	0.3658386	0.0045613	0.0144914	0.3622847
0.004ug = DL	6/10/2015	11:22:42 AM	0.0011289	0.0036652	0.0036652	µg			0.000954	0.0030971	0.0030971	0.0013039	0.0042332	0.0042332
0.080ug = QC STD 2	6/10/2015	11:24:25 AM	0.0253063	0.082159	0.082159	µg			0.0254969	0.0827779	0.0827779	0.0251156	0.0815401	0.0815401
Reagent Blank	6/10/2015	11:26:19 AM	0.0001661	0.0005393	0.0005393	µg			0.0002031	0.0006592	0.0006592	0.0001292	0.0004194	0.0004194

Appendix D

Calibration Data



Routine Dry Gas Meter Calibration

Control Module: C-2 Leak checks Barometric Press. -- 28.66
Date: 04/30/15 Negative PASS >5 W.C. Previous Y -- 0.9990
Technician: RBS Positive - PASS > in.Hg Previous Delta H -- 1.8716

Orifice Diff Pressure H	Wet Test Volume, Ft³	Dry Gas Meter Temp, F		Wet Test Meter Temp, F	Dry Gas Volume Ft³	Elapsed Time of Cal. Point		Meter Coefficient Y	Orifice Coefficient dH@
Nominal 0.500	Initial 674.00	Initial 83.0	Initial 81.0	Initial 74.0	Initial 893.660			1.0017	1.7026
Actual	Final 679.00	Final 83.0	Final 81.0	Final 74.0	Final 898.720	Minutes 12	SEC 5.03		
0.50	Total 5.00	Average 83.0	Average 81.0	Average 74.0	Total 5.060	Minutes 12.08			
		82.0							
Nominal 1.000	Initial 593.00	Initial 83.0	Initial 80.0	Initial 74.0	Initial 875.270			1.0094	1.8584
Actual	Final 598.00	Final 83.0	Final 80.0	Final 74.0	Final 880.280	Minutes 8.0	SEC 55.12		
1.00	Total 5.00	Average 83.0	Average 80.0	Average 74.0	Total 5.010	8.92			
		81.5 Tm							
Nominal 2.000	Initial 686.00	Initial 79.0	Initial 76.0	Initial 74.0	Initial 905.800			1.0014	1.8860
Actual	Final 691.00	Final 79.0	Final 76.0	Final 74.0	Final 910.800	Minutes 6	SEC 19.78		
2.00	Total 5.00	Average 79.0	Average 76.0	Average 74.0	Total 5.000	6.33			
		77.5 Tm							
Nominal 3.000	Initial 680.00	Initial 84.0	Initial 80.0	Initial 74.0	Initial 899.730			1.0052	1.9247
Actual	Final 685.00	Final 84.0	Final 80.0	Final 74.0	Final 904.740	Minutes 5.0	SEC 14.42		
3.00	Total 5.00	Average 84.0	Average 80.0	Average 74.0	Total 5.010	5.24	15		
		82.0 Tm							
Nominal 4.000	Initial 693.00	Initial 83.0	Initial 80.0	Initial 74.0	Initial 912.920			0.9860	1.9124
Actual	Final 703.00	Final 83.0	Final 80.0	Final 74.0	Final 923.100	Minutes 9.0	SEC 2.84		
4.00	Total 10.00	Average 83.0	Average 80.0	Average 74.0	Total 10.180	9.05			
		81.5 Tm		Average				1.0007	1.8568



Routine Dry Gas Meter Calibration

Control Module: C-9 Leak checks Barometric Press. -- 28.61
Date: 04/30/15 Negative PASS >5 W.C. Previous Y -- 0.9976
Technician: RBS Positive - PASS > in.Hg Previous Delta H -- 1.9932

Orifice Diff Pressure H	Wet Test Volume, Ft³	Dry Gas Meter Temp, F		Wet Test Meter Temp, F	Dry Gas Volume Ft³	Elapsed Time of Cal. Point		Meter Coefficient Y	Orifice Coefficient dH@
		Inlet	Outlet						
Nominal 0.500	Initial 662.00	Initial 77.0	Initial 74.0	Initial 73.0	Initial 871.180			1.0014	1.9027
Actual	Final 667.00	Final 77.0	Final 74.0	Final 73.0	Final 876.190	Minutes 12	SEC 42.24		
0.50	Total 5.00	Average 77.0	Average 74.0	Average 73.0	Total 5.010	Minutes 12.70			
		75.5							
Nominal 1.000	Initial 656.00	Initial 76.0	Initial 73.0	Initial 73.0	Initial 865.130			0.9987	1.9180
Actual	Final 661.00	Final 76.0	Final 74.0	Final 73.0	Final 870.140	Minutes 9.0	SEC 0.9		
1.00	Total 5.00	Average 76.0	Average 73.5	Average 73.0	Total 5.010	9.02			
		74.8 Tm							
Nominal 2.000	Initial 624.00	Initial 75.0	Initial 72.0	Initial 73.0	Initial 832.950			0.9958	1.9384
Actual	Final 629.00	Final 75.0	Final 72.0	Final 73.0	Final 837.950	Minutes 6	SEC 23.96		
2.00	Total 5.00	Average 75.0	Average 72.0	Average 73.0	Total 5.000	6.40			
		73.5 Tm							
Nominal 3.000	Initial 631.00	Initial 75.0	Initial 73.0	Initial 73.0	Initial 839.950			0.9942	2.0061
Actual	Final 636.00	Final 75.0	Final 73.0	Final 73.0	Final 844.950	Minutes 5.0	SEC 19.23		
3.00	Total 5.00	Average 75.0	Average 73.0	Average 73.0	Total 5.000	5.32			
		74.0 Tm							
Nominal 4.000	Initial 648.00	Initial 77.0	Initial 73.0	Initial 73.0	Initial 847.000			0.9896	1.9870
Actual	Final 658.00	Final 77.0	Final 73.0	Final 73.0	Final 857.040	Minutes 9.0	SEC 10.28		
4.00	Total 10.00	Average 77.0	Average 73.0	Average 73.0	Total 10.040	9.17			
		75.0 Tm		Average				0.9959	1.9504



Routine Dry Gas Meter Calibration

Control Module: C-8 Leak checks Barometric Press. -- 29.29
Date: 04/30/15 Negative Pass >5 W.C. Previous Y -- 1.0128
Technician: RMP Positive - Pass > in.Hg Previous Delta H -- 1.9167

Orifice Diff Pressure H	Wet Test Volume, Ft³	Dry Gas Meter Temp, F		Wet Test Meter Temp, F	Dry Gas Volume Ft³	Elapsed Time of Cal. Point		Meter Coefficient Y	Orifice Coefficient dH@
		Inlet	Outlet						
Nominal 0.500	Initial 7788.00	Initial 72.0	Initial 70.0	Initial 73.0	Initial 332.110			1.0120	1.9172
Actual	Final 7797.00	Final 75.0	Final 72.0	Final 73.0	Final 340.980	Minutes 23	SEC 9.62		
0.50	Total 9.00	Average 73.5	Average 71.0	Average 73.0	Total 8.870	Minutes 23.16			
		72.3							
Nominal 1.000	Initial 7781.00	Initial 70.0	Initial 70.0	Initial 73.0	Initial 325.120			0.9928	1.8823
Actual	Final 7787.00	Final 72.0	Final 70.0	Final 73.0	Final 331.120	Minutes 10.0	SEC 48.46		
1.00	Total 6.00	Average 71.0	Average 70.0	Average 73.0	Total 6.000	10.81			
		70.5 Tm							
Nominal 2.000	Initial 7798.00	Initial 76.0	Initial 72.0	Initial 73.0	Initial 341.970			1.0035	1.9765
Actual	Final 7805.00	Final 80.0	Final 73.0	Final 73.0	Final 348.940	Minutes 9	SEC 9.47		
2.00	Total 7.00	Average 78.0	Average 72.5	Average 73.0	Total 6.970	9.16			
		75.3 Tm							
Nominal 3.000	Initial 7807.00	Initial 81.0	Initial 73.0	Initial 73.0	Initial 350.950			0.9891	1.9758
Actual	Final 7816.00	Final 84.0	Final 74.0	Final 72.5	Final 360.070	Minutes 9.0	SEC 37.53		
3.00	Total 9.00	Average 82.5	Average 73.5	Average 72.8	Total 9.120	9.63			
		78.0 Tm							
Nominal 4.000	Initial 7834.00	Initial 87.0	Initial 76.0	Initial 72.5	Initial 378.570			0.9938	1.9865
Actual	Final 7844.00	Final 88.0	Final 77.0	Final 72.5	Final 388.710	Minutes 9.0	SEC 19.06		
4.00	Total 10.00	Average 87.5	Average 76.5	Average 72.5	Total 10.140	9.32			
		82.0 Tm		Average				0.9982	1.9476

Emission Measurement Center (EMC) Approved Alternate Method (ALT-009)
Alternative Method 5 Post-Test Calibration
Line 3 Waste Gas Stack (SV103)
Control Module C-2

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test date	-	-	5/6/2015	5/7/2015	5/7/2015
Test period	-	-	1616 - 2022	807 - 1022	1054 - 1413
Total run time	t	min	120	120	120
Total sample volume measured by dry gas meter	V _m	acf	112.9	109.8	108.8
Absolute average dry gas meter temp	T _m	°F	74.3	75.8	77.9
Absolute average dry gas meter temp	T _m	°R	534.0	535.5	537.5
Barometric pressure	P _b	inches Hg	28.3	28.0	28.0
Conversion factor (29.92/528)(0.75) ²	---	(in Hg/°R) cfm ²	0.0319	0.0319	0.0319
Average orifice meter differential	Δ h _{avg}	in. H ₂ O	2.82	2.62	2.57
Orifice meter calibration coefficient	Δ H _@	in. H ₂ O	1.86	1.86	1.86
Dry molecular weight of stack gas	M _d	lb/lb-mole	29.14	29.14	29.14
Dry molecular weight of air	---	lb/lb-mole	29.00	29.00	29.00
Specific gravity of mercury	---	Dimensionless	13.60	13.60	13.60
Dry gas meter calibration check value	Y _{qa}	Dimensionless	1.0099	1.0083	1.0093
Dry gas meter calibration factor	Y	Dimensionless	1.0007	1.0007	1.0007
Average of Y _{qa} 's from test run series	1.0092	$Y_{qa} = \frac{t}{V_m} \sqrt{\frac{0.0319 \cdot T_m}{\Delta H_{@} (P_b + \frac{\Delta h_{avg}}{13.6})} \frac{29}{M_d}} \cdot (\sqrt{\Delta h_{avg}})$			
Dry gas meter calibration factor	1.0007				
% difference between average Y _{qa} 's and Y (must be within ± 5%)	-0.85%				

Emission Measurement Center (EMC) Approved Alternate Method (ALT-009)
Alternative Method 5 Post-Test Calibration
Line 4 Waste Gas Stack (SV118)
Control Module C-9

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test date	-	-	5/8/2015	5/8/2015	5/8/2015
Test period	-	-	757 - 1006	1038 - 1250	1318 - 1530
Total run time	t	min	120	120	120
Total sample volume measured by dry gas meter	V _m	acf	85.8	87.4	88.0
Absolute average dry gas meter temp	T _m	°F	57.8	62.4	67.4
Absolute average dry gas meter temp	T _m	°R	517.5	522.1	527.1
Barometric pressure	P _b	inches Hg	28.1	28.1	28.1
Conversion factor (29.92/528)(0.75) ²	---	(in Hg/°R) cfm ²	0.0319	0.0319	0.0319
Average orifice meter differential	Δ h _{avg}	in. H ₂ O	1.78	1.84	1.84
Orifice meter calibration coefficient	Δ H _@	in. H ₂ O	1.95	1.95	1.95
Dry molecular weight of stack gas	M _d	lb/lb-mole	29.14	29.14	29.14
Dry molecular weight of air	---	lb/lb-mole	29.00	29.00	29.00
Specific gravity of mercury	---	Dimensionless	13.60	13.60	13.60
Dry gas meter calibration check value	Y _{qa}	Dimensionless	1.0184	1.0221	1.0191
Dry gas meter calibration factor	Y	Dimensionless	0.9959	0.9959	0.9959
Average of Y _{qa} 's from test run series	1.0199	$Y_{qa} = \frac{t}{V_m} \sqrt{\frac{0.0319 \cdot T_m}{\Delta H_{@} (P_b + \frac{\Delta h_{avg}}{13.6})} \frac{29}{M_d}} \cdot (\sqrt{\Delta h_{avg}})$			
Dry gas meter calibration factor	0.9959				
% difference between average Y _{qa} 's and Y (must be within ± 5%)	-2.41%				

Emission Measurement Center (EMC) Approved Alternate Method (ALT-009)
Alternative Method 5 Post-Test Calibration
Line 6 Waste Gas Stack (SV144)
Control Module C-8

Input Data	Symbol	Units	Run 1	Run 2	Run 3
Test date	-	-	5/21/2015	5/21/2015	5/21/2015
Test period	-	-	815 - 1236	1316 - 1534	1613 - 1826
Total run time	t	min	120	120	120
Total sample volume measured by dry gas meter	V _m	acf	84.0	88.0	85.6
Absolute average dry gas meter temp	T _m	°F	96.0	101.8	99.6
Absolute average dry gas meter temp	T _m	°R	555.6	561.4	559.3
Barometric pressure	P _b	inches Hg	28.2	28.2	28.2
Conversion factor (29.92/528)(0.75) ²	---	(in Hg/°R) cfm ²	0.0319	0.0319	0.0319
Average orifice meter differential	Δ h _{avg}	in. H ₂ O	1.62	1.73	1.63
Orifice meter calibration coefficient	Δ H _@	in. H ₂ O	1.95	1.95	1.95
Dry molecular weight of stack gas	M _d	lb/lb-mole	29.09	29.09	29.11
Dry molecular weight of air	---	lb/lb-mole	29.00	29.00	29.00
Specific gravity of mercury	---	Dimensionless	13.60	13.60	13.60
Dry gas meter calibration check value	Y _{qa}	Dimensionless	1.0290	1.0203	1.0144
Dry gas meter calibration factor	Y	Dimensionless	0.9982	0.9982	0.9982
Average of Y _{qa} 's from test run series	1.0213	$Y_{qa} = \frac{t}{V_m} \sqrt{\frac{0.0319 \cdot T_m}{\Delta H_{@} (P_b + \frac{\Delta h_{avg}}{13.6})} \frac{29}{M_d}} \cdot (\sqrt{\Delta h_{avg}})$			
Dry gas meter calibration factor	0.9982				
% difference between average Y _{qa} 's and Y (must be within ± 5%)	-2.31%				



THERMOCOUPLE CALIBRATION

Meter In THERMOCOUPLE ID T-C2-I
Cal Date: 1/13/2015

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS	TRACEABILITY	DATE	LABORATORY
Hart Scientific 9103-A s/n A1B289	Report No. B4116012	1/16/2014	Hart Scientific
Hart Scientific 9140 s/n A1B086	Report No. T10-0105-1	12/18/2013	Hart Scientific
Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	71.0	150.0
Difference (degrees)	1.0	1.0	0.0
TC Meets Method 5 Specifications: (± 5.4 °F)	YES	YES	YES

Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Meter Out

THERMOCOUPLE ID T-C2-O

Cal Date: 1/13/2015

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

1/16/2014

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	70.0	150.0
Difference (degrees)	1.0	0.0	0.0

TC Meets Method 5 Specifications: (± 5.4 °F)	YES	YES	YES
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Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Meter In THERMOCOUPLE ID T-C9-I
Cal Date: 1/13/2015

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

1/16/2014

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	70.0	150.0
Difference (degrees)	1.0	0.0	0.0

TC Meets Method 5 Specifications: (± 5.4 °F)	YES	YES	YES
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Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Meter Out

THERMOCOUPLE ID T-C9-O

Cal Date: 1/13/2015

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

1/16/2014

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	69.0	150.0
Difference (degrees)	1.0	1.0	0.0

TC Meets Method 5 Specifications: (± 5.4 °F)	YES	YES	YES
---	-----	-----	-----

Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Meter In THERMOCOUPLE ID T-C8-I
Cal Date: 12/31/2014

CALIBRATION TECHNICIAN: DAH

REFERENCE STANDARDS	TRACEABILITY		DATE	LABORATORY
Hart Scientific 9103-A s/n A1B289	Report No. B4116012		12/27/2013	Hart Scientific
Hart Scientific 9140 s/n A1B086	Report No. T10-0105-1		12/18/2013	Hart Scientific
Temperature Calibration Points	20	70	150	
Reference Deg F (To)	20	70	150	
Probe Temp (deg F)	22.0	70.0	149.0	
Difference (degrees)	2.0	0.0	1.0	
TC Meets Method 5 Specifications: (± 5.4 °F)				
	YES	YES	YES	

Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Meter Out

THERMOCOUPLE ID T-C8-O

Cal Date: 12/31/2014

CALIBRATION TECHNICIAN: DAH

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

12/27/2013

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	70.0	149.0
Difference (degrees)	1.0	0.0	1.0

TC Meets Method 5 Specifications: (± 5.4 °F)	YES	YES	YES
---	-----	-----	-----

Technician signature

QA signature



PYROMETER CALIBRATION

Pyrometer Number: C-2 Date: 1-19-15
Pyrometer Reference: CL-3512-A Technician: RBS

Reference (°F)	Reference (°C)	Pyrometer ° F	
		Reading	Pass/Fail
1000	538	1002	Pass
950	510	954	Pass
900	482	902	Pass
850	454	853	Pass
800	427	802	Pass
750	399	750	Pass
700	371	702	Pass
650	343	653	Pass
600	316	601	Pass
550	288	551	Pass
500	260	498	Pass
450	232	452	Pass
400	204	397	Pass
350	177	351	Pass
300	149	299	Pass
250	121	253	Pass
200	93	198	Pass
150	67	151	Pass
100	38	96	Pass
50	10	48	Pass
0	-18	-1	Pass
-50	-46	-50	Pass

Pass/Fail based on +/- 0.75% of Renkin value

Technician signature:

QA signature:



PYROMETER CALIBRATION

Pyrometer Number: C-9 Date: 1-19-15
Pyrometer Reference: CL-3512-A Technician: RBS

Reference (°F)	Reference (°C)	Pyrometer ° F	
		Reading	Pass/Fail
1000	538	1003	Pass
950	510	954	Pass
900	482	902	Pass
850	454	854	Pass
800	427	800	Pass
750	399	753	Pass
700	371	703	Pass
650	343	650	Pass
600	316	602	Pass
550	288	550	Pass
500	260	499	Pass
450	232	450	Pass
400	204	399	Pass
350	177	350	Pass
300	149	300	Pass
250	121	250	Pass
200	93	200	Pass
150	67	150	Pass
100	38	98	Pass
50	10	49	Pass
0	-18	0	Pass
-50	-46	-48	Pass

Pass/Fail based on +/- 0.75% of Renkin value

Technician signature:

QA signature:



PYROMETER CALIBRATION

Pyrometer Number: C-8 Date: 12/23/2014
Pyrometer Reference: CL-300-100F Technician: DAH

Reference (°F)	Reference (°C)	Pyrometer ° F	
		Reading	Pass/Fail
1000	538	1002	Pass
950	510	952	Pass
900	482	899	Pass
850	454	851	Pass
800	427	801	Pass
750	399	752	Pass
700	371	699	Pass
650	343	651	Pass
600	316	600	Pass
550	288	549	Pass
500	260	498	Pass
450	232	447	Pass
400	204	398	Pass
350	177	348	Pass
300	149	299	Pass
250	121	250	Pass
200	93	199	Pass
150	67	148	Pass
100	38	97	Pass
50	10	48	Pass
0	-18	0	Pass
-50	-46	-51	Pass

Pass/Fail based on +/- 0.75% of Renkin value

Technician signature *David Herber*
QA signature: *[Signature]*



S-Type Pitot Tube Geometry Check

Pitot Tube Number: 5-3

Length: 5 ft

Function: M-5 Probe / Free

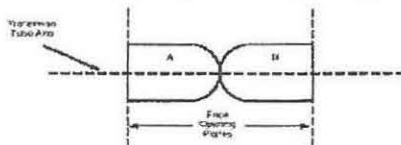
Inspection Date: 1/20/15

Technician: BAW

1. Are face openings perpendicular to tube axis?

☒ YES (go to 2)

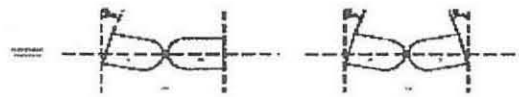
☐ NO (go to 1a)



1a. If NO, is angle less than 10°?

☐ YES (go to 2)

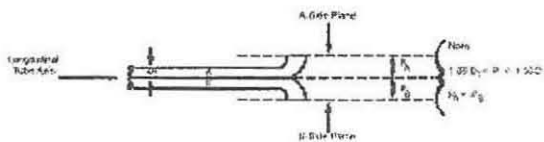
☐ NO (discontinue use)



2. Are face openings parallel to longitudinal axis?

☒ YES (go to 3)

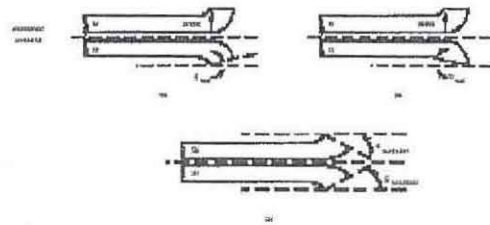
☐ NO (go to 2a)



2a. If NO, is angle less than 5°?

☐ YES (go to 3)

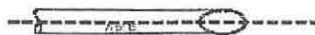
☐ NO (discontinue use)



3. Are legs of equal length?

☒ YES (go to 4)

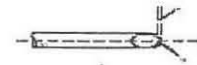
☐ NO (go to 3a)



3a. If NO, is difference less than 1/8 inch?

☐ YES (go to 4)

☐ NO (discontinue use)



4. Are center-lines of legs coincident?

☒ YES (go to 5)

☐ NO (go to 4a)



4a. If NO, are center-lines of face openings less than 1/32 inch?

☐ YES (go to 5)

☐ NO (discontinue use)



5. Does this pitot tube pass all of the above criteria?

☒ YES

☐ NO

Technician Signature: BAW

QA Signature: BAW



S-Type Pitot Tube Geometry Check

Pitot Tube Number: 7-3

Length: 7 ft

Function: M-5 Probe / Free

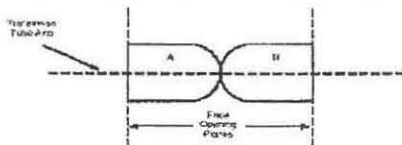
Inspection Date: 1/20/15

Technician: B. W.

1. Are face openings perpendicular to tube axis?

☒ YES (go to 2)

☐ NO (go to 1a)



1a. If NO, is angle less than 10°?

☐ YES (go to 2)

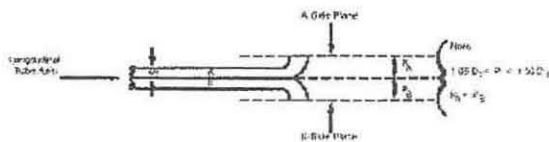
☐ NO (discontinue use)



2. Are face openings parallel to longitudinal axis?

☒ YES (go to 3)

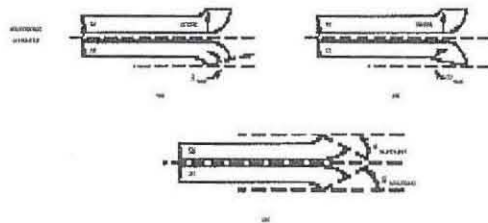
☐ NO (go to 2a)



2a. If NO, is angle less than 5°?

☐ YES (go to 3)

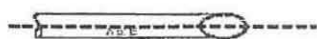
☐ NO (discontinue use)



3. Are legs of equal length?

☒ YES (go to 4)

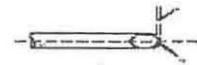
☐ NO (go to 3a)



3a. If NO, is difference less than 1/8 inch?

☐ YES (go to 4)

☐ NO (discontinue use)



4. Are center-lines of legs coincident?

☒ YES (go to 5)

☐ NO (go to 4a)



4a. If NO, are center-lines of face openings less than 1/32 inch?

☐ YES (go to 5)

☐ NO (discontinue use)



5. Does this pitot tube pass all of the above criteria?

☒ YES

☐ NO

Technician Signature: B. W.

QA Signature: D. W.



THERMOCOUPLE CALIBRATION

THERMOCOUPLE ID 5-3

Cal Date: 12/23/2014

Probe

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

1/16/2014

12/18/2013

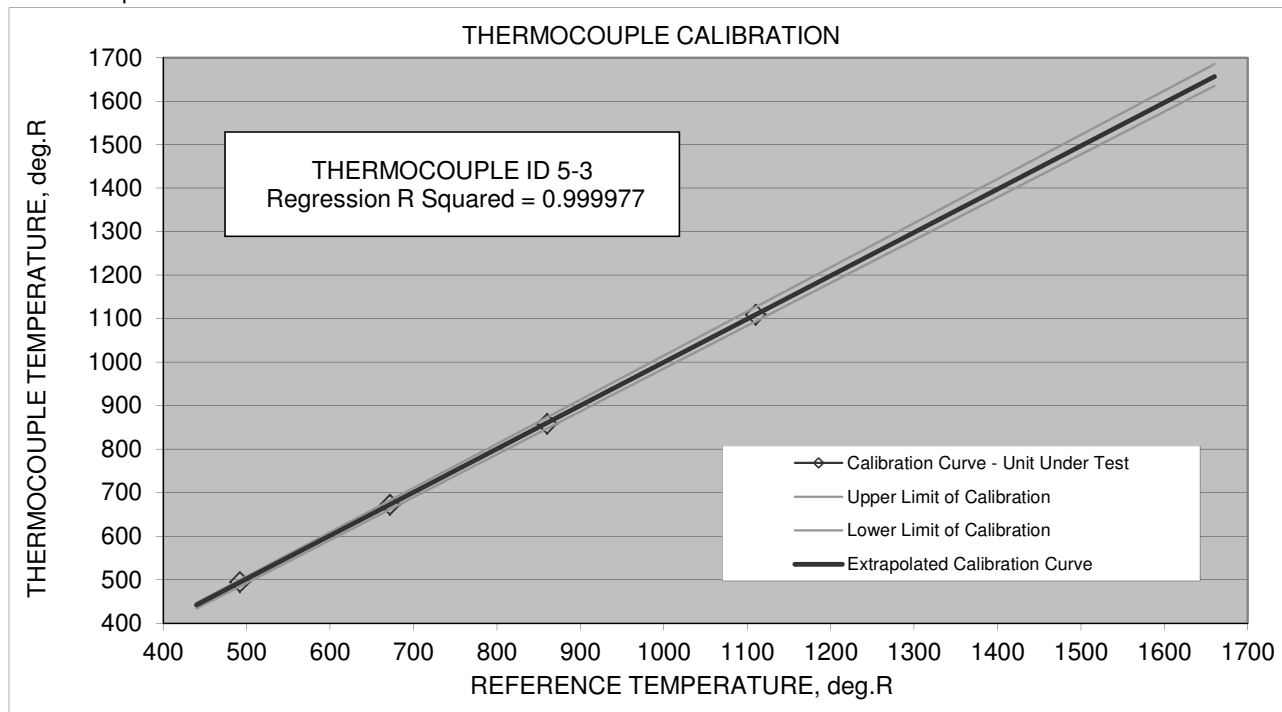
LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points

	32	212	400	650	Ambient
Reference Deg F (To)	32	212	400	650	70
Probe Temp (deg F)	34	212	398	649	71
Reference Temp (deg R) deg F + 460	492	672	860	1110	530
Probe Temp (deg R), deg F + 460	494	672	858	1109	531
Difference (degrees)	-2	0	2	1	-1
% Diff Abs. T	0.4%	0.0%	0.2%	0.1%	0.2%
Is difference less than 1.5% at all measured points?	YES				



Are extrapolated limits less than 1.5%?

YES

**FAHRENHEIT
CALIBRATION RANGE**
-20 1200

If not acceptable, describe corrective action:

Technician signature

QA signature



THERMOCOUPLE CALIBRATION

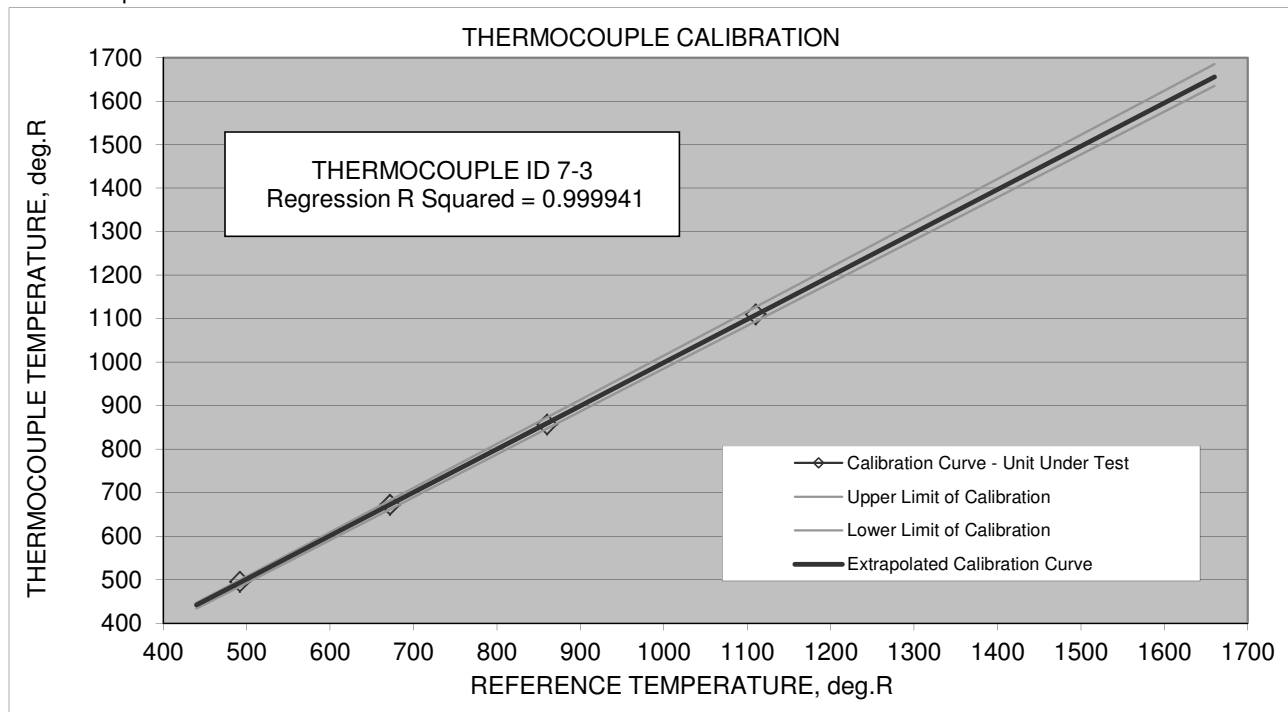
THERMOCOUPLE ID 7-3

Cal Date: 12/23/2014

Probe

CALIBRATION TECHNICIAN: RBS

REFERENCE STANDARDS	TRACEABILITY		DATE	LABORATORY	
Hart Scientific 9103-A s/n A1B289	Report No. B4116012		1/16/2014	Hart Scientific	
Hart Scientific 9140 s/n A1B086	Report No. T10-0105-1		12/18/2013	Hart Scientific	
Temperature Calibration Points	32	212	400	650	Ambient
Reference Deg F (To)	32	212	400	650	70
Probe Temp (deg F)	35	212	397	650	71
Reference Temp (deg R) deg F + 460	492	672	860	1110	530
Probe Temp (deg R), deg F + 460	495	672	857	1110	531
Difference (degrees)	-3	0	3	0	-1
% Diff Abs. T	0.6%	0.0%	0.3%	0.0%	0.2%
Is difference less than 1.5% at all measured points?	YES				



Are extrapolated limits less than 1.5%? YES

FAHRENHEIT
CALIBRATION RANGE
-20 1200

If not acceptable, describe corrective action:

Technician signature

QA signature

U. S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
July 1, 2015

Nozzle Calibration
Line 3 Waste Gas Stack (SV103)

Nozzle Calibration

Nozzle No.

Glass

Used for Runs:

1

 -

3


Point Measurement, inches

1	0.250
2	0.250
3	0.250
Average	0.250

Test Date 5/6/2015

Date Measured: 5/6/2015

Technician: TAK

Signature: 

U. S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
June 21, 2015

Nozzle Calibration
Line 4 Waste Gas Stack (SV118)

Nozzle Calibration

Nozzle No.

Glass

Used for Runs:

1

 -

3

Point Measurement, inches

1	0.214
2	0.215
3	0.214
Average	0.214

Test Date 5/8/2015

Date Measured: 5/8/2015

Technician: TAK

Signature: 

U. S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
July 1, 2015

Nozzle Calibration
Line 6 Waste Gas Stack (SV144)

Nozzle Calibration

Nozzle No.

Glass

Used for Runs:

1

 -

3


Point Measurement, inches

1	0.255
2	0.255
3	0.255
Average	0.255

Test Date 5/21/2015

Date Measured: 5/21/2015

Technician: DJK

Signature: 



Field Barometer Calibration

Calibration to National Weather Service at Chisholm-Hibbing Airport

Station elevation at Barr Hibbing Office 3128 14th Avenue East, Hibbing, MN 1460 ft.

Barometer: BA-23

		NWS Observation		Field Barometer			Barr Office		
Date	Technician	Time	Altimeter	ID	Time	Barometric Pressure	Station Pressure	Condition	Remarks
3/9/15	DJK	8:53	29.82	BA-23	9:54	28.40	28.36	In Calibration	As Found
5/11/15	DJK	10:53	29.72	BA-23	11:46	28.29	28.26	In Calibration	As Found
6/4/15	DJK	13:53	30.03	BA-23	14:46	28.62	28.57	In Calibration	As Found

Report Of Analysis
EPA Protocol Gas Mixtures

BARR01

TO: Barr Engineering Co
Attn: Benjamin Wiltse
5150 West 76th Street
Edina, MN 55439-2900
(952) 832-2885

REPORT NO: 65320-01

REPORT DATE: August 13, 2014

CUSTOMER PO NO: BAW07172014

CYLINDER NUMBER: **CC99473**

CYLINDER SIZE: 150A (141 std cu ft)

CYLINDER PRESSURE: 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD		ANALYZER MAKE, MODEL, S/N, DETECTION	REPLICATE ANALYSIS DATA
Carbon dioxide	4.91 ± 0.05 %	GMIS	SRM 1674b	Varian Model 3400	<u>8/7/2014</u>
			Samp#: 7-H-39	Serial # 10680	4.92 %
			Cyl#: CC116770	Thermal Conductivity	4.91 %
			7.99 ± 0.08 %	Gas Chromotography	4.91 %
			Exp: 3/18/2022	Exp: 6/17/2019	LAST CAL DATE: 8/7/2014 \bar{x} : 4.91 %
Oxygen	22.47 ± 0.28 %	GMIS	SRM 2659a	Varian Model 3800	<u>8/12/2014</u>
			Samp#: 71-D-23	Serial # None	22.55 %
			Cyl#: CC88824	Thermal Conductivity	22.37 %
			24.92 ± 0.25 %	Gas Chromotography	22.50 %
			Exp: 2/25/2021	Exp: 1/1/2016	LAST CAL DATE: 7/16/2014 \bar{x} : 22.47 %
Nitrogen	Balance				

CERTIFICATION DATE: August 7, 2014

EPA EXPIRATION DATE: August 8, 2022

ppm = μ mole/mole

% = mole-%

 \bar{x} = EPA weighted mean

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA600/R-12/531, dated May 2012.

The above analyses should not be used if the cylinder pressure is less than 100 psig.

ANALYST:

M.S. Calhoun

APPROVED:

J. T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

Report Of Analysis
EPA Protocol Gas Mixtures

BARR01

TO: Barr Engineering Co
Attn: Benjamin Wiltse
5150 West 76th Street
Edina, MN 55439-2900
(952) 832-2885

REPORT NO: 65434-01

REPORT DATE: September 9, 2014

CUSTOMER PO NO: BAW08182014

CYLINDER NUMBER: CC102877

CYLINDER SIZE: 150A (141 std cu ft)

CYLINDER PRESSURE: 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD		ANALYZER MAKE, MODEL, S/N, DETECTION	REPLICATE ANALYSIS DATA
Carbon dioxide	9.98 ± 0.1 %	GMIS	SRM 1674b	Varian Model 3400	8/28/2014
			Samp#: 7-H-39	Serial # 10680	9.98 %
			Cyl#: CC116770	Thermal Conductivity	9.99 %
			7.99 ± 0.08 %	Gas Chromotography	9.98 %
			Exp: 3/18/2022	Exp: 6/17/2019	LAST CAL DATE: 8/28/2014 x̄: 9.98 %
Oxygen	10.02 ± 0.08 %	GMIS	SRM 2658a	Varian Model 3800	9/4/2014
			Samp#: 72-D-37	Serial # None	10.08 %
			Cyl#: CC51181	Thermal Conductivity	9.99 %
			10.06 ± 0.05 %	Gas Chromotography	10.00 %
			Exp: 5/6/2021	Exp: 6/1/2017	LAST CAL DATE: 8/19/2014 x̄: 10.02 %
Nitrogen	Balance				

CERTIFICATION DATE: August 28, 2014

EPA EXPIRATION DATE: August 29, 2022

ppm = µmole/mole

% = mole-%

x̄ = EPA weighted mean

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA600/R-12/531, dated May 2012.

The above analyses should not be used if the cylinder pressure is less than 100 psig.

ANALYST:

M.S. Calhoun

APPROVED:

J. T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

Appendix E

Process Operating Data

Air Performance Test Form

Operating Data Summary for Process Sources

Facility Information (please print)

Company Name: U. S. Steel Corporation

Equipment ID No: SV103

Test date(s): 5/6/2015 and 5/7/2015

Equipment and Operating Data

- Process Equipment Description: Line 3 Waste Gas Stack
- Were the process and control equipment operated consistent with normal procedures? ☒ Yes ☐ No If no, explain: _____
- 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.
- Date(s) and procedure(s) of last maintenance/cleaning within 6 months:
☒ Remains unchanged from info. provided in test plan
- 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	Run 4	Average
Greenball Feed Rate, LTPH	300	295	297		297
Fired Pellet Production, LTPH	239	235	238		237
Fuel Input (list units) Wood, MBTUH	25.4	25.0	25.3		25.2
Fuel Input (list units) Gas, MBTUH	149.5	142.0	141.2		144.2
Heat Input (10 ⁶ British thermal units/hour) Total	174.8	167.0	166.5		169.4

- 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): DP (in. w.c.) and feed rate (gpm and psig)
- Baghouse, Cyclone, and Multi-clone: DP (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	Run 4	Average
Scrubber dP, in. H ₂ O	11.8	11.5	11.9		11.7
Scrubber water flow rate, GPM	2,452	2,450	2,448		2450
List pollutant & averaging basis.--should reflect permit	Run 1	Run 2	Run 3	Run 4	Average
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

5/6/2015 & 5/7/2015

Run	Time		Feed Rates LTPH		Prod. Rate	Wood			Gas MBTUH		Total	dP	Water Flow
	Start	End	Green ball	To Grate	LTPH	lbs/min	MMBTU/ton	MBTUH	Grate	Kiln	MBTUH		
1*	16:16	20:22	300.2	284.0	238.5	50	16.9	25.4	44.0	105.5	174.8	11.8	2,452
2	8:07	10:22	295.2	280.2	235.3	49	16.9	25.0	43.5	98.5	167.0	11.5	2,450
3*	10:54	14:13	297.0	283.0	237.7	50	16.9	25.3	42.6	98.7	166.5	11.9	2,448

*data excludes no testing periods

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/6/15 16:10	300.7	17.7	52.0	45.1	104.3	11.7	1098.7	1354.6	2453.3
5/6/15 16:11	297.9	17.8	52.0	45.2	103.6	11.5	1098.6	1354.6	2453.2
5/6/15 16:12	310.1	17.2	52.0	45.3	103.1	11.5	1098.5	1354.6	2453.1
5/6/15 16:13	306.2	18.0	52.0	44.6	103.4	11.4	1098.4	1354.6	2453.0
5/6/15 16:14	301.8	16.9	52.0	44.9	103.3	11.3	1098.3	1354.6	2452.9
5/6/15 16:15	306.8	17.4	52.0	45.1	103.3	11.3	1098.2	1354.6	2452.8
5/6/15 16:16	301.7	17.8	52.0	44.3	103.3	11.3	1098.0	1354.6	2452.7
5/6/15 16:17	290.5	17.2	52.0	45.3	102.0	11.3	1097.9	1354.6	2452.6
5/6/15 16:18	294.4	17.6	52.0	45.5	102.2	11.4	1097.8	1354.6	2452.4
5/6/15 16:19	289.5	16.6	52.0	45.3	102.4	11.5	1097.7	1354.6	2452.3
5/6/15 16:20	298.9	16.3	52.0	45.6	102.6	11.6	1097.6	1354.6	2452.2
5/6/15 16:21	299.6	16.4	52.0	44.8	102.8	11.6	1097.5	1354.6	2452.1
5/6/15 16:22	304.5	16.2	52.0	44.3	103.0	11.5	1097.4	1354.6	2452.0
5/6/15 16:23	306.3	16.7	52.0	45.1	103.0	11.5	1097.3	1354.6	2451.9
5/6/15 16:24	312.6	18.2	52.0	44.9	103.7	11.5	1097.2	1354.6	2451.8
5/6/15 16:25	308.9	16.8	52.0	45.3	103.3	11.6	1097.1	1354.6	2451.7
5/6/15 16:26	305.5	17.1	52.0	44.4	103.0	11.7	1097.0	1354.6	2451.6
5/6/15 16:27	297.0	16.3	52.0	44.5	102.7	11.7	1096.8	1354.6	2451.5
5/6/15 16:28	301.7	16.1	52.0	45.2	102.8	11.8	1096.7	1354.6	2451.4
5/6/15 16:29	303.7	16.6	52.0	44.8	103.2	11.9	1096.6	1354.6	2451.2
5/6/15 16:30	297.6	15.3	52.0	45.2	103.3	11.9	1096.5	1354.6	2451.1
5/6/15 16:31	298.1	15.8	52.0	44.9	103.5	11.9	1096.4	1354.6	2451.0
5/6/15 16:32	296.6	15.6	52.0	45.4	103.9	11.9	1096.3	1354.6	2450.9
5/6/15 16:33	290.6	14.7	52.0	44.6	103.2	11.9	1096.2	1354.6	2450.8
5/6/15 16:34	286.6	15.8	52.0	45.4	103.5	11.9	1096.1	1354.6	2450.7
5/6/15 16:35	283.5	14.5	52.0	44.5	103.7	12.0	1096.0	1354.6	2450.6
5/6/15 16:36	293.3	15.2	52.0	44.8	104.0	12.0	1095.9	1354.6	2450.5
5/6/15 16:37	298.3	16.0	52.0	45.2	103.9	11.9	1095.8	1354.6	2450.4
5/6/15 16:38	305.4	15.8	52.0	44.7	104.2	11.9	1095.7	1354.6	2450.3
5/6/15 16:39	311.5	15.7	52.0	44.8	104.0	11.8	1095.5	1354.6	2450.2
5/6/15 16:40	316.3	16.2	52.0	45.1	103.8	11.7	1095.4	1354.6	2450.0
5/6/15 16:41	310.7	16.2	52.0	44.7	103.2	11.6	1095.3	1354.6	2449.9
5/6/15 16:42	310.6	16.9	52.0	44.8	103.4	11.5	1095.2	1354.6	2449.8
5/6/15 16:43	296.5	17.1	52.0	45.3	103.4	11.6	1095.1	1354.6	2449.7
5/6/15 16:44	290.1	16.2	52.0	44.9	103.0	11.7	1095.0	1354.6	2449.6
5/6/15 16:45	290.5	16.1	52.0	44.7	102.9	11.7	1094.9	1354.6	2449.5
5/6/15 16:46	293.2	15.3	52.0	44.8	103.3	11.9	1094.8	1354.6	2449.4
5/6/15 16:47	295.8	16.0	52.0	44.9	103.7	11.8	1094.7	1354.6	2449.3
5/6/15 16:48	299.8	15.9	52.0	44.6	104.1	11.8	1094.6	1354.6	2449.2
5/6/15 16:49	300.8	15.1	48.6	44.7	104.1	11.8	1094.5	1354.6	2449.1
5/6/15 16:50	308.1	15.7	42.0	44.7	104.1	11.8	1094.3	1354.6	2449.0
5/6/15 16:51	308.3	15.7	35.4	45.0	104.2	11.8	1094.2	1354.6	2448.8
5/6/15 16:52	309.9	15.8	28.8	44.6	103.9	11.7	1094.1	1354.6	2448.7
5/6/15 16:53	304.8	17.3	22.2	45.2	103.9	11.6	1094.0	1354.6	2448.6
5/6/15 16:54	304.1	16.2	15.6	44.5	103.1	11.7	1093.9	1354.6	2448.5
5/6/15 16:55	293.2	16.4	9.0	44.5	103.4	11.9	1093.8	1354.6	2448.4
5/6/15 16:56	289.7	15.5	0.0	44.6	103.2	12.0	1093.7	1354.6	2448.3
5/6/15 16:57	296.2	15.0	0.0	44.7	103.2	12.1	1093.6	1354.6	2448.2
5/6/15 16:58	291.2	15.9	0.0	44.8	104.3	11.9	1093.5	1354.6	2448.1
5/6/15 16:59	18.9	9.5	0.0	0.0	105.4	9.3	1093.4	1354.6	2448.0
5/6/15 17:00	4.3	2.9	0.0	0.0	106.1	2.7	1093.3	1354.6	2447.9
5/6/15 17:01	4.0	4.2	0.0	0.0	105.2	2.4	1093.1	1354.6	2447.8
5/6/15 17:02	3.8	3.4	0.0	0.0	104.8	2.3	1093.0	1354.6	2447.6
5/6/15 17:03	3.5	4.1	0.0	0.0	104.5	2.3	1092.9	1354.6	2447.5
5/6/15 17:04	13.9	3.9	0.0	0.0	104.1	2.3	1092.8	1354.7	2447.5
5/6/15 17:05	122.9	6.7	0.0	0.0	104.8	3.1	1092.8	1356.0	2448.8
5/6/15 17:06	125.6	10.1	19.6	0.0	107.1	4.5	1092.8	1357.4	2450.2
5/6/15 17:07	129.3	8.7	42.7	0.0	110.2	4.3	1092.9	1358.7	2451.6
5/6/15 17:08	133.1	8.3	42.1	0.0	111.6	4.3	1092.9	1360.1	2453.0
5/6/15 17:09	138.7	10.1	27.7	0.0	111.1	3.4	1093.0	1361.4	2454.4
5/6/15 17:10	152.8	8.9	13.4	0.0	108.9	2.8	1093.0	1362.7	2455.8

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/6/15 17:11	173.0	9.9	33.3	0.0	106.0	2.5	1093.1	1364.1	2457.2
5/6/15 17:12	179.0	10.3	52.0	0.0	104.3	2.9	1093.1	1365.4	2458.6
5/6/15 17:13	191.4	9.9	52.0	4.2	103.2	2.1	1093.2	1366.8	2460.0
5/6/15 17:14	192.2	10.8	52.0	7.9	101.0	3.8	1093.2	1366.9	2460.1
5/6/15 17:15	189.9	10.4	52.0	9.2	100.6	4.8	1093.3	1366.0	2459.2
5/6/15 17:16	180.8	10.1	52.0	9.9	101.2	6.9	1093.3	1365.0	2458.3
5/6/15 17:17	169.4	10.6	52.0	9.6	102.3	7.3	1093.3	1364.1	2457.4
5/6/15 17:18	165.9	9.6	52.0	8.6	102.9	8.2	1093.4	1363.1	2456.5
5/6/15 17:19	156.9	10.0	52.0	7.7	103.1	7.3	1093.4	1362.2	2455.6
5/6/15 17:20	157.3	10.2	52.0	6.9	104.6	3.1	1093.5	1361.2	2454.7
5/6/15 17:21	204.5	9.5	52.0	11.0	107.7	2.4	1093.5	1360.3	2453.8
5/6/15 17:22	208.6	11.2	52.0	25.0	104.3	3.0	1093.6	1359.3	2452.9
5/6/15 17:23	206.7	11.1	52.0	26.7	101.3	5.8	1093.6	1358.4	2452.0
5/6/15 17:24	208.6	11.9	52.0	26.9	101.2	8.6	1093.7	1357.4	2451.1
5/6/15 17:25	205.5	12.2	52.0	28.3	104.1	9.7	1093.7	1356.5	2450.2
5/6/15 17:26	209.5	10.8	52.0	28.9	106.0	10.2	1093.8	1355.5	2449.3
5/6/15 17:27	204.2	11.9	52.0	28.9	107.3	10.1	1093.8	1354.6	2448.4
5/6/15 17:28	206.0	11.1	52.0	29.1	105.6	7.6	1093.8	1354.6	2448.4
5/6/15 17:29	206.4	11.4	52.0	28.7	105.0	3.7	1093.9	1354.5	2448.4
5/6/15 17:30	212.3	12.5	52.0	29.2	102.8	2.4	1093.9	1354.5	2448.4
5/6/15 17:31	211.2	11.6	9.4	29.2	97.4	2.4	1094.0	1354.5	2448.5
5/6/15 17:32	211.5	12.0	31.7	29.6	94.2	3.0	1094.0	1354.4	2448.5
5/6/15 17:33	212.9	12.5	52.0	29.7	92.3	7.1	1094.1	1354.4	2448.5
5/6/15 17:34	214.8	11.8	52.0	30.4	97.6	9.4	1094.1	1354.4	2448.5
5/6/15 17:35	223.1	12.4	52.0	30.8	104.1	10.1	1094.2	1354.3	2448.5
5/6/15 17:36	230.5	12.7	52.0	31.1	106.3	10.3	1094.2	1354.3	2448.5
5/6/15 17:37	233.6	12.3	52.0	32.0	106.8	9.7	1094.3	1354.3	2448.5
5/6/15 17:38	235.5	13.4	52.0	32.7	104.9	8.8	1094.3	1354.2	2448.5
5/6/15 17:39	229.1	12.3	52.0	33.5	103.1	8.3	1094.3	1354.2	2448.6
5/6/15 17:40	232.6	13.4	52.0	33.6	102.6	8.0	1094.4	1354.2	2448.6
5/6/15 17:41	235.2	13.4	52.0	34.0	102.7	8.0	1094.4	1354.1	2448.6
5/6/15 17:42	235.8	13.0	52.0	35.0	101.6	7.9	1094.5	1354.1	2448.6
5/6/15 17:43	237.8	13.9	52.0	35.2	102.2	7.9	1094.5	1354.1	2448.6
5/6/15 17:44	238.9	13.2	52.0	34.8	101.2	7.9	1094.6	1354.0	2448.6
5/6/15 17:45	239.1	13.0	52.0	35.0	101.3	7.8	1094.6	1354.0	2448.6
5/6/15 17:46	240.7	13.6	52.0	35.8	101.2	7.9	1094.7	1354.0	2448.6
5/6/15 17:47	242.3	12.9	52.0	35.1	101.8	7.9	1094.7	1353.9	2448.6
5/6/15 17:48	239.6	13.4	52.0	36.0	101.3	8.0	1094.8	1353.9	2448.7
5/6/15 17:49	239.0	13.9	52.0	35.5	101.6	8.2	1094.8	1353.9	2448.7
5/6/15 17:50	243.5	13.3	52.0	35.6	101.8	8.3	1094.8	1353.8	2448.7
5/6/15 17:51	247.5	13.9	52.0	36.8	102.0	8.5	1094.9	1353.8	2448.7
5/6/15 17:52	250.5	13.8	52.0	36.7	102.3	8.7	1094.9	1353.8	2448.7
5/6/15 17:53	254.8	13.8	52.0	37.7	102.5	8.7	1095.0	1353.7	2448.7
5/6/15 17:54	255.0	14.1	52.0	38.2	102.7	8.7	1095.0	1353.7	2448.7
5/6/15 17:55	262.2	13.7	52.0	38.4	102.9	8.8	1095.1	1353.7	2448.7
5/6/15 17:56	260.6	15.0	52.0	39.4	103.2	9.0	1095.1	1353.6	2448.8
5/6/15 17:57	273.8	15.4	52.0	40.4	103.3	9.1	1095.2	1353.6	2448.8
5/6/15 17:58	268.6	15.1	52.0	41.1	103.2	9.1	1095.2	1353.6	2448.8
5/6/15 17:59	268.2	15.5	52.0	41.3	103.5	9.2	1095.2	1353.5	2448.8
5/6/15 18:00	268.8	15.3	52.0	40.9	104.3	9.2	1095.3	1353.5	2448.8
5/6/15 18:01	270.5	15.1	52.0	40.9	104.3	9.3	1095.3	1353.5	2448.8
5/6/15 18:02	276.5	15.6	52.0	41.9	104.3	9.5	1095.4	1353.4	2448.8
5/6/15 18:03	278.4	15.0	52.0	42.4	104.3	9.7	1095.4	1353.4	2448.8
5/6/15 18:04	279.9	15.1	52.0	42.2	104.4	9.9	1095.5	1353.4	2448.9
5/6/15 18:05	286.3	15.3	52.0	43.2	104.4	10.0	1095.5	1353.3	2448.9
5/6/15 18:06	288.4	15.5	52.0	43.7	104.4	10.2	1095.6	1353.3	2448.9
5/6/15 18:07	288.5	16.8	52.0	43.6	105.1	10.4	1095.6	1353.3	2448.9
5/6/15 18:08	291.1	16.4	52.0	43.1	105.7	10.5	1095.7	1353.2	2448.9
5/6/15 18:09	286.4	16.2	52.0	42.6	104.9	10.6	1095.7	1353.2	2448.9
5/6/15 18:10	291.8	16.7	52.0	43.5	105.3	10.8	1095.7	1353.2	2448.9
5/6/15 18:11	290.4	15.9	52.0	43.0	105.8	10.9	1095.8	1353.1	2448.9
5/6/15 18:12	298.0	16.9	52.0	43.2	106.2	11.0	1095.8	1353.1	2448.9

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/6/15 18:13	295.7	17.2	52.0	43.1	106.8	11.0	1095.9	1353.1	2449.0
5/6/15 18:14	296.7	16.7	52.0	43.9	107.6	11.1	1095.9	1353.0	2449.0
5/6/15 18:15	299.6	16.9	52.0	43.4	107.1	11.3	1096.0	1353.0	2449.0
5/6/15 18:16	303.3	16.8	52.0	43.1	107.8	11.5	1096.0	1353.0	2449.0
5/6/15 18:17	306.4	16.9	52.0	42.9	107.8	11.5	1096.1	1352.9	2449.0
5/6/15 18:18	308.0	17.4	52.0	43.0	107.3	11.5	1096.1	1352.9	2449.0
5/6/15 18:19	308.2	17.0	52.0	43.7	106.8	11.5	1096.2	1352.9	2449.0
5/6/15 18:20	302.3	17.0	52.0	42.9	106.3	11.6	1096.2	1352.8	2449.0
5/6/15 18:21	301.0	16.7	52.0	43.5	107.3	11.7	1096.2	1352.8	2449.1
5/6/15 18:22	296.7	16.8	52.0	43.3	108.2	11.8	1096.3	1352.8	2449.1
5/6/15 18:23	295.5	17.2	52.0	43.1	109.1	11.9	1096.3	1352.7	2449.1
5/6/15 18:24	294.7	17.0	52.0	43.8	109.9	11.9	1096.4	1352.7	2449.1
5/6/15 18:25	295.4	17.2	52.0	43.0	110.8	12.1	1096.4	1352.7	2449.1
5/6/15 18:26	299.3	17.0	52.0	43.1	111.5	12.1	1096.5	1352.6	2449.1
5/6/15 18:27	302.8	16.5	52.0	43.3	111.9	12.2	1096.5	1352.6	2449.1
5/6/15 18:28	302.8	17.0	52.0	43.2	112.5	12.2	1096.6	1352.6	2449.1
5/6/15 18:29	303.9	17.4	52.0	43.4	113.3	12.3	1096.6	1352.5	2449.1
5/6/15 18:30	298.1	17.5	52.0	43.6	113.0	12.2	1096.7	1352.5	2449.2
5/6/15 18:31	301.2	17.8	52.0	43.0	112.8	12.2	1096.7	1352.5	2449.2
5/6/15 18:32	299.2	16.6	52.0	43.5	112.5	12.2	1096.7	1352.4	2449.2
5/6/15 18:33	305.5	16.5	52.0	43.1	113.4	12.2	1096.8	1352.4	2449.2
5/6/15 18:34	302.6	17.7	52.0	43.3	113.0	12.2	1096.8	1352.4	2449.2
5/6/15 18:35	294.0	16.7	52.0	44.0	112.7	12.1	1096.9	1352.3	2449.2
5/6/15 18:36	292.6	17.0	52.0	43.2	112.4	12.2	1096.9	1352.3	2449.2
5/6/15 18:37	302.4	16.6	52.0	43.0	112.5	12.2	1097.0	1352.3	2449.2
5/6/15 18:38	300.1	16.7	52.0	43.9	112.2	12.2	1097.0	1352.2	2449.3
5/6/15 18:39	307.3	17.2	52.0	43.3	112.2	12.1	1097.1	1352.2	2449.3
5/6/15 18:40	305.5	16.7	52.0	44.0	112.4	12.0	1097.1	1352.2	2449.3
5/6/15 18:41	299.6	16.6	52.0	43.8	111.4	11.9	1097.2	1352.1	2449.3
5/6/15 18:42	298.7	17.1	52.0	43.7	110.4	11.9	1097.2	1352.1	2449.3
5/6/15 18:43	302.5	16.5	52.0	42.7	110.2	11.9	1097.2	1352.1	2449.3
5/6/15 18:44	301.3	17.0	52.0	43.7	110.4	11.8	1097.3	1352.0	2449.3
5/6/15 18:45	299.4	17.1	52.0	44.5	109.9	11.9	1097.3	1352.0	2449.3
5/6/15 18:46	299.8	16.4	52.0	43.9	110.1	11.9	1097.4	1352.0	2449.4
5/6/15 18:47	299.9	16.8	52.0	43.8	109.5	11.9	1097.4	1351.9	2449.4
5/6/15 18:48	304.4	16.3	52.0	43.6	109.2	11.9	1097.5	1351.9	2449.4
5/6/15 18:49	303.2	16.9	52.0	43.5	109.5	11.8	1097.5	1351.9	2449.4
5/6/15 18:50	297.4	16.7	52.0	43.5	109.6	11.7	1097.6	1351.8	2449.4
5/6/15 18:51	292.9	16.1	52.0	43.8	109.7	11.7	1097.6	1351.8	2449.4
5/6/15 18:52	299.6	16.7	52.0	42.8	108.9	11.8	1097.7	1351.8	2449.4
5/6/15 18:53	295.6	16.1	52.0	43.8	109.3	11.8	1097.7	1351.7	2449.4
5/6/15 18:54	296.7	16.2	52.0	43.2	108.9	11.8	1097.7	1351.7	2449.4
5/6/15 18:55	299.9	16.9	52.0	43.1	108.8	11.9	1097.8	1351.7	2449.5
5/6/15 18:56	298.1	16.2	52.0	43.3	109.4	11.9	1097.8	1351.6	2449.5
5/6/15 18:57	300.7	15.9	52.0	42.9	109.3	11.9	1097.9	1351.6	2449.5
5/6/15 18:58	300.2	17.2	52.0	44.3	109.1	11.9	1097.9	1351.6	2449.5
5/6/15 18:59	300.1	16.4	52.0	44.4	109.0	11.8	1098.0	1351.5	2449.5
5/6/15 19:00	302.5	17.1	52.0	43.7	108.8	11.8	1098.0	1351.5	2449.5
5/6/15 19:01	298.1	17.1	52.0	43.6	108.7	11.8	1098.1	1351.5	2449.5
5/6/15 19:02	297.1	16.5	52.0	43.2	108.5	11.9	1098.1	1351.4	2449.5
5/6/15 19:03	300.4	17.0	52.0	43.3	108.4	11.9	1098.2	1351.4	2449.6
5/6/15 19:04	302.4	16.1	52.0	44.2	108.2	12.0	1098.2	1351.4	2449.6
5/6/15 19:05	299.4	16.7	52.0	43.8	108.1	12.0	1098.2	1351.3	2449.6
5/6/15 19:06	299.8	16.9	52.0	43.7	107.9	12.0	1098.3	1351.3	2449.6
5/6/15 19:07	291.4	16.2	52.0	43.4	107.8	11.9	1098.3	1351.3	2449.6
5/6/15 19:08	301.0	17.2	52.0	43.5	107.6	11.9	1098.4	1351.2	2449.6
5/6/15 19:09	304.8	16.0	52.0	43.2	107.5	11.9	1098.4	1351.2	2449.6
5/6/15 19:10	306.4	16.5	52.0	43.7	107.8	11.8	1098.5	1351.2	2449.6
5/6/15 19:11	300.1	16.9	52.0	43.8	108.0	11.7	1098.5	1351.1	2449.7
5/6/15 19:12	304.2	16.3	52.0	43.1	108.1	11.8	1098.6	1351.1	2449.7
5/6/15 19:13	303.7	16.7	52.0	43.1	107.8	11.8	1098.6	1351.1	2449.7
5/6/15 19:14	299.5	17.3	52.0	43.7	107.6	11.8	1098.7	1351.0	2449.7

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/6/15 19:15	297.3	16.2	52.0	42.9	107.4	11.8	1098.7	1351.0	2449.7
5/6/15 19:16	299.7	16.6	52.0	43.3	107.2	11.8	1098.7	1351.0	2449.7
5/6/15 19:17	297.9	16.4	52.0	43.6	107.1	11.8	1098.8	1351.3	2450.1
5/6/15 19:18	303.0	16.2	52.0	44.4	107.2	11.8	1098.8	1351.9	2450.7
5/6/15 19:19	297.9	17.0	52.0	43.7	107.4	11.7	1098.9	1352.5	2451.4
5/6/15 19:20	305.3	15.8	52.0	43.7	107.5	11.8	1098.9	1353.1	2452.0
5/6/15 19:21	305.1	16.3	52.0	43.6	106.5	11.8	1099.0	1353.7	2452.7
5/6/15 19:22	310.5	16.4	52.0	44.1	106.5	11.8	1099.0	1354.3	2453.3
5/6/15 19:23	299.8	16.0	52.0	43.3	106.6	11.6	1099.1	1354.9	2454.0
5/6/15 19:24	297.5	16.4	52.0	43.5	106.6	11.6	1099.1	1355.5	2454.7
5/6/15 19:25	295.8	15.9	52.0	43.4	106.6	11.6	1099.1	1356.2	2455.3
5/6/15 19:26	297.9	16.4	52.0	44.1	106.6	11.6	1099.2	1356.4	2455.6
5/6/15 19:27	299.4	16.8	52.0	43.8	106.6	11.7	1099.2	1356.4	2455.6
5/6/15 19:28	301.9	15.8	52.0	43.6	106.6	11.8	1099.3	1356.3	2455.6
5/6/15 19:29	297.2	16.0	52.0	43.3	106.6	11.8	1099.3	1356.3	2455.6
5/6/15 19:30	294.3	16.0	52.0	43.8	106.7	11.8	1099.4	1356.3	2455.6
5/6/15 19:31	298.0	15.3	52.0	43.9	106.7	11.7	1099.4	1356.2	2455.7
5/6/15 19:32	302.6	16.7	52.0	43.4	106.7	11.8	1099.5	1356.2	2455.7
5/6/15 19:33	301.8	16.4	52.0	43.1	106.5	11.8	1099.5	1356.2	2455.7
5/6/15 19:34	302.1	16.3	52.0	43.4	106.3	11.7	1099.6	1356.1	2455.7
5/6/15 19:35	297.8	16.6	52.0	43.2	106.1	11.8	1099.6	1356.1	2455.7
5/6/15 19:36	303.9	15.3	52.0	43.5	105.8	11.8	1099.6	1356.0	2455.7
5/6/15 19:37	303.0	16.4	52.0	43.4	106.8	11.9	1099.7	1356.0	2455.7
5/6/15 19:38	298.8	16.4	52.0	43.3	106.4	11.9	1099.7	1356.0	2455.7
5/6/15 19:39	297.7	15.6	52.0	43.4	106.0	11.9	1099.8	1355.9	2455.7
5/6/15 19:40	301.2	15.8	52.0	43.4	105.6	12.0	1099.8	1355.9	2455.7
5/6/15 19:41	299.9	16.2	52.0	43.4	106.1	11.9	1099.9	1355.8	2455.7
5/6/15 19:42	298.6	16.0	52.0	43.3	105.6	11.8	1099.9	1355.8	2455.7
5/6/15 19:43	298.0	16.8	52.0	43.3	105.8	11.8	1100.0	1355.8	2455.7
5/6/15 19:44	304.5	16.1	52.0	43.6	105.2	11.8	1100.0	1355.7	2455.7
5/6/15 19:45	301.0	16.3	52.0	43.4	105.6	11.7	1100.1	1355.7	2455.7
5/6/15 19:46	306.4	16.1	52.0	43.7	106.3	11.7	1100.1	1355.6	2455.7
5/6/15 19:47	302.1	16.1	52.0	43.4	106.3	11.7	1100.0	1355.6	2455.6
5/6/15 19:48	299.3	16.5	52.0	43.8	105.9	11.7	1099.9	1355.6	2455.5
5/6/15 19:49	301.8	15.5	52.0	43.6	105.5	11.8	1099.8	1355.5	2455.3
5/6/15 19:50	295.5	15.7	52.0	43.7	105.6	11.8	1099.7	1355.5	2455.2
5/6/15 19:51	301.8	15.8	52.0	44.0	104.4	11.8	1099.6	1355.5	2455.1
5/6/15 19:52	303.6	15.5	52.0	43.5	105.4	11.8	1099.5	1355.4	2454.9
5/6/15 19:53	303.4	16.5	52.0	43.6	105.3	11.8	1099.4	1355.4	2454.8
5/6/15 19:54	300.6	16.3	52.0	43.5	105.3	11.8	1099.3	1355.3	2454.7
5/6/15 19:55	297.8	15.8	52.0	43.5	105.3	11.9	1099.3	1355.3	2454.5
5/6/15 19:56	293.9	16.4	52.0	43.8	105.3	12.0	1099.2	1355.3	2454.4
5/6/15 19:57	294.4	15.5	52.0	43.7	105.2	12.1	1099.1	1355.2	2454.3
5/6/15 19:58	298.8	16.0	52.0	43.3	105.2	12.0	1099.0	1355.2	2454.2
5/6/15 19:59	297.6	16.8	52.0	43.4	105.2	12.0	1098.9	1355.1	2454.0
5/6/15 20:00	298.9	15.8	52.0	43.4	105.2	12.0	1098.8	1355.1	2453.9
5/6/15 20:01	305.6	16.6	52.0	43.5	105.1	11.9	1098.7	1355.1	2453.8
5/6/15 20:02	302.0	16.2	52.0	43.5	104.9	11.8	1098.6	1355.0	2453.6
5/6/15 20:03	305.1	15.9	52.0	43.5	104.7	11.8	1098.5	1355.0	2453.5
5/6/15 20:04	301.3	17.0	52.0	43.2	104.5	11.8	1098.4	1354.9	2453.4
5/6/15 20:05	299.5	16.4	52.0	44.1	104.6	11.7	1098.3	1354.9	2453.2
5/6/15 20:06	295.2	15.8	52.0	43.1	104.9	11.8	1098.2	1354.9	2453.1
5/6/15 20:07	300.7	16.2	52.0	43.3	104.7	11.7	1098.1	1354.8	2453.0
5/6/15 20:08	299.4	15.6	52.0	43.6	104.5	11.8	1098.0	1354.8	2452.8
5/6/15 20:09	302.9	16.1	52.0	42.9	104.3	11.7	1098.0	1354.7	2452.7
5/6/15 20:10	302.0	15.9	52.0	43.2	104.0	11.7	1097.9	1354.7	2452.6
5/6/15 20:11	303.7	15.4	52.0	43.6	104.2	11.8	1097.8	1354.7	2452.4
5/6/15 20:12	299.4	16.5	52.0	43.7	104.0	11.8	1097.7	1354.6	2452.3
5/6/15 20:13	298.6	16.0	52.0	43.2	104.8	11.9	1097.6	1354.6	2452.2
5/6/15 20:14	293.5	16.0	52.0	44.2	104.6	11.8	1097.5	1354.6	2452.1
5/6/15 20:15	297.1	16.4	52.0	43.7	104.5	11.8	1097.4	1354.6	2452.0
5/6/15 20:16	300.2	15.9	52.0	43.7	104.7	11.8	1097.3	1354.6	2451.9

Line 3 Waste Gas Stack (SV103) Process Data

	AL613151	AI614065	AI617Q01	AI612013	AC614017	AI616019	AI616024	AI616025	
Timestamp	030-03-0 TOTAL TONS TO 031	037-01-1 ROLL FEEDER UNDERSIZE	000-03-0 WOOD FLOW	242-03-1 PH BURNER GAS FLOW	252-03-1 KILN BURNER LINE GAS	247-03-1 Scrubber dP	247-03-1 Upper Flow	247-03-1 Lower Flow	Total Flow
5/6/15 20:17	304.9	16.4	52.0	43.9	104.8	11.8	1097.2	1354.6	2451.8
5/6/15 20:18	301.8	16.1	52.0	43.6	105.0	11.7	1097.1	1354.6	2451.7
5/6/15 20:19	304.8	15.8	52.0	44.2	104.3	11.6	1097.0	1354.6	2451.6
5/6/15 20:20	304.7	16.3	52.0	43.2	104.5	11.7	1096.9	1354.6	2451.5
5/6/15 20:21	300.0	15.4	52.0	43.3	104.0	11.8	1096.8	1354.6	2451.4
5/6/15 20:22	303.7	15.4	52.0	43.7	104.4	11.8	1096.7	1354.6	2451.4
5/6/15 20:23	303.3	16.2	52.0	43.8	103.5	11.9	1096.6	1354.6	2451.3
5/6/15 20:24	302.3	15.7	52.0	44.0	103.5	11.9	1096.6	1354.6	2451.2
5/6/15 20:25	305.1	16.5	52.0	43.1	103.5	11.8	1096.5	1354.6	2451.1
5/6/15 20:26	298.7	16.6	52.0	43.2	103.5	11.9	1096.4	1354.6	2451.0
5/6/15 20:27	303.4	15.8	52.0	43.2	103.5	11.9	1096.3	1354.6	2450.9
5/6/15 20:28	295.1	16.5	52.0	43.5	103.6	11.9	1096.2	1354.6	2450.8
5/6/15 20:29	293.2	15.0	52.0	43.1	101.1	11.9	1096.1	1354.6	2450.7
5/6/15 20:30	293.0	16.5	52.0	43.6	99.9	12.1	1096.0	1354.6	2450.6
5/7/15 8:00	300.1	15.8	48.0	43.5	98.8	11.4	1078.3	1372.3	2450.5
5/7/15 8:01	299.8	16.5	48.0	43.8	98.8	11.4	1078.5	1372.1	2450.6
5/7/15 8:02	295.3	16.5	48.0	43.4	98.8	11.3	1078.7	1372.0	2450.7
5/7/15 8:03	296.9	15.9	48.0	44.0	98.8	11.3	1078.9	1371.8	2450.8
5/7/15 8:04	298.7	16.6	48.0	43.8	98.8	11.4	1079.2	1371.7	2450.8
5/7/15 8:05	298.0	15.9	48.0	43.9	98.7	11.5	1079.4	1371.5	2450.9
5/7/15 8:06	292.6	16.8	47.4	44.0	98.7	11.4	1079.6	1371.3	2451.0
5/7/15 8:07	295.1	16.4	46.6	43.7	98.7	11.4	1079.9	1371.2	2451.0
5/7/15 8:08	293.2	15.7	45.8	43.7	98.4	11.5	1080.1	1371.0	2451.1
5/7/15 8:09	298.2	16.6	45.0	43.9	99.3	11.4	1080.3	1370.9	2451.2
5/7/15 8:10	296.2	16.0	44.2	43.0	99.1	11.4	1080.5	1370.7	2451.3
5/7/15 8:11	290.2	16.1	49.2	44.0	98.9	11.4	1080.8	1370.6	2451.3
5/7/15 8:12	293.6	16.3	50.2	43.6	98.7	11.4	1081.0	1370.4	2451.4
5/7/15 8:13	292.1	15.9	50.6	43.6	98.5	11.5	1081.2	1370.2	2451.5
5/7/15 8:14	297.6	15.7	52.4	43.0	98.3	11.5	1081.5	1370.1	2451.5
5/7/15 8:15	297.0	16.6	52.9	43.3	98.1	11.5	1081.7	1369.9	2451.6
5/7/15 8:16	293.6	15.2	53.4	43.6	98.2	11.5	1081.9	1369.8	2451.7
5/7/15 8:17	294.1	15.8	53.8	43.4	98.3	11.5	1082.1	1369.6	2451.8
5/7/15 8:18	291.7	15.8	54.3	44.1	98.4	11.5	1082.4	1369.5	2451.8
5/7/15 8:19	290.2	15.6	54.7	43.1	98.5	11.5	1082.6	1369.3	2451.9
5/7/15 8:20	294.0	16.0	55.2	43.5	98.6	11.5	1082.8	1369.1	2452.0
5/7/15 8:21	294.9	15.3	55.6	43.0	98.7	11.4	1083.1	1369.0	2452.0
5/7/15 8:22	295.0	15.2	53.5	43.4	98.8	11.4	1083.3	1368.8	2452.1
5/7/15 8:23	294.5	15.8	52.9	43.1	98.9	11.4	1083.5	1368.7	2452.2
5/7/15 8:24	293.7	15.3	54.1	43.5	99.0	11.4	1083.8	1368.5	2452.3
5/7/15 8:25	294.3	16.1	55.2	43.1	99.1	11.4	1084.0	1368.4	2452.3
5/7/15 8:26	296.5	15.1	53.9	43.7	99.0	11.3	1084.2	1368.2	2452.4
5/7/15 8:27	297.0	15.6	52.9	43.3	97.9	11.3	1084.4	1368.0	2452.5
5/7/15 8:28	292.2	16.6	54.2	43.3	98.2	11.3	1084.7	1367.9	2452.5
5/7/15 8:29	291.3	15.8	55.5	43.7	98.5	11.3	1084.9	1367.7	2452.6
5/7/15 8:30	292.9	15.2	50.2	43.5	98.8	11.4	1085.1	1367.6	2452.7
5/7/15 8:31	296.4	16.3	48.0	43.2	98.8	11.4	1085.4	1367.4	2452.8
5/7/15 8:32	291.1	15.1	48.0	43.3	98.7	11.4	1085.6	1367.3	2452.8
5/7/15 8:33	290.9	15.6	48.0	43.7	98.6	11.5	1085.8	1367.1	2452.9
5/7/15 8:34	294.2	15.3	48.0	43.6	98.4	11.5	1086.0	1366.9	2453.0
5/7/15 8:35	297.6	15.2	48.0	43.1	98.3	11.6	1086.3	1366.8	2453.0
5/7/15 8:36	293.7	15.9	48.0	43.2	98.2	11.5	1086.5	1366.6	2453.1
5/7/15 8:37	288.3	14.9	48.0	43.4	98.1	11.5	1086.7	1366.5	2453.2
5/7/15 8:38	289.0	14.8	48.0	43.2	98.0	11.5	1087.0	1366.3	2453.3
5/7/15 8:39	293.6	15.3	47.3	43.8	97.9	11.6	1087.2	1366.1	2453.3
5/7/15 8:40	295.0	14.8	45.7	43.1	98.0	11.6	1084.6	1366.0	2450.6
5/7/15 8:41	295.2	15.2	44.2	43.5	98.2	11.6	1079.9	1365.8	2445.8
5/7/15 8:42	298.6	15.0	46.9	43.7	98.4	11.6	1075.3	1365.7	2440.9
5/7/15 8:43	297.9	14.7	45.6	44.0	98.7	11.5	1070.6	1369.6	2440.2
5/7/15 8:44	298.4	15.4	44.3	43.4	98.9	11.4	1065.9	1377.3	2443.3
5/7/15 8:45	296.6	15.3	48.0	43.8	98.9	11.3	1061.7	1385.1	2446.8
5/7/15 8:46	297.6	15.0	48.0	43.2	98.7	11.2	1062.1	1392.9	2455.0

Line 3 Waste Gas Stack (SV103) Process Data

	AI613151	AI614065	AI617Q01	AI612013	AC614017	AI616019	AI616024	AI616025	
Timestamp	030-03-0 TOTAL TONS TO 031	037-01-1 ROLL FEEDER UNDERSIZE	000-03-0 WOOD FLOW	242-03-1 PH BURNER GAS FLOW	252-03-1 KILN BURNER LINE GAS	247-03-1 Scrubber dP	247-03-1 Upper Flow	247-03-1 Lower Flow	Total Flow
5/7/15 8:47	291.5	15.0	48.1	43.1	98.5	11.3	1062.4	1396.1	2458.5
5/7/15 8:48	292.0	14.9	48.8	43.6	98.9	11.3	1062.8	1394.9	2457.7
5/7/15 8:49	297.8	14.8	49.5	43.4	97.9	11.3	1063.2	1393.7	2456.9
5/7/15 8:50	298.0	14.9	50.2	43.7	98.2	11.4	1063.6	1392.4	2456.0
5/7/15 8:51	295.6	14.5	51.0	43.5	98.5	11.4	1064.0	1391.2	2455.2
5/7/15 8:52	297.2	15.1	51.7	43.7	98.5	11.3	1064.3	1390.0	2454.3
5/7/15 8:53	292.3	14.6	50.3	43.8	98.5	11.4	1064.7	1388.8	2453.5
5/7/15 8:54	291.8	15.5	51.6	43.3	98.5	11.3	1065.1	1387.6	2452.7
5/7/15 8:55	295.3	15.3	48.6	43.5	98.5	11.4	1065.5	1386.3	2451.8
5/7/15 8:56	298.8	15.1	48.5	43.4	98.5	11.5	1065.9	1385.1	2451.0
5/7/15 8:57	294.4	15.1	49.2	43.2	98.5	11.5	1066.2	1383.9	2450.1
5/7/15 8:58	299.1	14.6	49.9	43.5	98.6	11.4	1066.6	1382.7	2449.3
5/7/15 8:59	300.3	15.1	50.5	43.6	98.6	11.5	1067.0	1381.5	2448.5
5/7/15 9:00	303.7	15.7	51.2	43.5	98.6	11.5	1067.4	1380.2	2447.6
5/7/15 9:01	298.3	15.3	51.9	43.8	98.6	11.3	1067.8	1379.0	2446.8
5/7/15 9:02	291.7	15.5	48.0	43.4	98.6	11.5	1068.1	1377.8	2445.9
5/7/15 9:03	294.9	14.9	48.0	43.2	98.6	11.6	1068.5	1376.6	2445.1
5/7/15 9:04	295.2	14.9	49.9	43.6	98.4	11.8	1068.9	1375.4	2444.3
5/7/15 9:05	294.9	15.2	49.7	44.2	98.7	11.8	1069.3	1374.1	2443.4
5/7/15 9:06	296.2	14.9	50.9	43.3	98.7	11.8	1069.7	1372.9	2442.6
5/7/15 9:07	294.7	14.6	48.6	42.9	98.7	11.9	1070.0	1371.7	2441.7
5/7/15 9:08	295.9	15.3	48.2	43.1	98.7	11.9	1070.4	1371.1	2441.5
5/7/15 9:09	296.6	14.0	50.8	43.4	98.6	11.9	1070.8	1371.2	2442.0
5/7/15 9:10	295.9	14.8	52.0	43.5	98.6	11.9	1071.2	1371.2	2442.4
5/7/15 9:11	297.9	15.3	52.0	43.4	98.6	11.9	1071.6	1371.3	2442.9
5/7/15 9:12	297.1	14.3	52.2	43.9	98.6	11.9	1071.9	1371.4	2443.3
5/7/15 9:13	294.7	15.2	53.9	43.5	98.6	11.8	1072.3	1371.4	2443.7
5/7/15 9:14	290.4	14.5	55.6	43.4	98.6	11.8	1072.7	1371.5	2444.2
5/7/15 9:15	290.5	14.7	51.0	43.5	98.5	11.9	1073.1	1371.5	2444.6
5/7/15 9:16	289.7	15.9	49.5	43.7	98.5	11.9	1073.5	1371.6	2445.0
5/7/15 9:17	296.7	14.5	48.0	43.3	98.5	11.8	1073.8	1371.6	2445.5
5/7/15 9:18	299.9	15.5	48.0	43.2	98.5	11.5	1074.2	1371.7	2445.9
5/7/15 9:19	294.6	15.1	48.0	43.7	98.5	11.4	1074.6	1371.8	2446.4
5/7/15 9:20	294.8	14.3	48.0	43.7	98.5	11.3	1075.0	1371.8	2446.8
5/7/15 9:21	291.9	15.3	47.6	43.5	98.4	11.3	1075.4	1371.9	2447.2
5/7/15 9:22	293.9	14.7	47.1	43.7	98.4	11.3	1075.7	1371.9	2447.7
5/7/15 9:23	294.4	14.7	46.6	43.2	98.4	11.3	1076.1	1372.0	2448.1
5/7/15 9:24	292.9	15.1	46.2	43.8	98.4	11.2	1076.5	1372.1	2448.5
5/7/15 9:25	293.2	13.8	45.7	43.2	98.4	11.2	1076.9	1372.1	2449.0
5/7/15 9:26	298.5	15.0	45.2	43.8	98.4	11.2	1077.3	1372.2	2449.4
5/7/15 9:27	297.8	15.6	44.7	42.8	98.3	11.2	1077.6	1372.2	2449.9
5/7/15 9:28	300.9	14.7	44.2	43.3	98.3	11.1	1078.0	1372.3	2450.3
5/7/15 9:29	298.2	16.2	47.1	43.3	98.3	11.2	1078.4	1372.3	2450.7
5/7/15 9:30	295.0	15.0	45.3	43.8	98.3	11.2	1078.8	1372.4	2451.2
5/7/15 9:31	292.2	15.3	48.3	43.1	98.3	11.3	1079.2	1372.5	2451.6
5/7/15 9:32	297.4	15.2	50.2	43.4	98.3	11.4	1079.5	1372.5	2452.1
5/7/15 9:33	295.3	14.2	49.5	43.8	98.2	11.5	1079.9	1372.6	2452.5
5/7/15 9:34	304.6	15.0	50.6	43.3	98.2	11.6	1080.3	1372.6	2452.9
5/7/15 9:35	299.9	14.6	50.5	43.3	98.2	11.6	1080.7	1372.7	2453.4
5/7/15 9:36	294.1	14.5	48.0	43.3	98.2	11.5	1081.1	1372.8	2453.8
5/7/15 9:37	291.8	15.1	49.1	43.5	98.2	11.6	1081.4	1372.8	2454.2
5/7/15 9:38	295.4	14.1	48.0	43.4	98.2	11.7	1081.2	1372.9	2454.0
5/7/15 9:39	294.3	15.0	48.0	43.3	98.1	11.8	1073.2	1373.0	2446.2
5/7/15 9:40	293.0	15.4	48.0	43.2	98.1	11.7	1065.3	1383.1	2448.4
5/7/15 9:41	299.3	14.5	48.0	43.3	98.1	11.7	1058.0	1393.1	2451.1
5/7/15 9:42	296.4	15.6	48.0	43.5	98.3	11.7	1058.6	1392.4	2451.0
5/7/15 9:43	300.4	14.9	48.0	43.0	98.5	11.6	1059.2	1391.6	2450.9
5/7/15 9:44	298.5	14.7	48.0	43.3	98.7	11.6	1059.8	1390.9	2450.8
5/7/15 9:45	292.8	15.4	48.0	43.1	98.8	11.6	1060.4	1390.2	2450.7
5/7/15 9:46	290.5	14.0	45.6	43.5	98.4	11.6	1061.0	1389.5	2450.6
5/7/15 9:47	291.3	14.7	44.4	43.7	98.4	11.6	1061.6	1388.8	2450.5
5/7/15 9:48	295.2	15.5	50.9	43.8	98.4	11.6	1062.2	1388.1	2450.4

Line 3 Waste Gas Stack (SV103) Process Data

	AL613151	AI614065	AI617Q01	AI612013	AC614017	AI616019	AI616024	AI616025	
Timestamp	030-03-0 TOTAL TONS TO 031	037-01-1 ROLL FEEDER UNDERSIZE	000-03-0 WOOD FLOW	242-03-1 PH BURNER GAS FLOW	252-03-1 KILN BURNER LINE GAS	247-03-1 Scrubber dP	247-03-1 Upper Flow	247-03-1 Lower Flow	Total Flow
5/7/15 9:49	295.5	14.3	48.9	43.2	98.4	11.6	1062.9	1387.4	2450.3
5/7/15 9:50	294.9	15.5	50.2	44.1	98.4	11.5	1063.5	1386.7	2450.2
5/7/15 9:51	296.9	14.3	51.5	43.5	98.3	11.5	1064.1	1386.0	2450.1
5/7/15 9:52	300.2	14.5	48.9	43.6	98.3	11.6	1064.7	1385.3	2450.0
5/7/15 9:53	299.3	15.6	49.1	44.1	98.3	11.6	1065.3	1384.6	2449.9
5/7/15 9:54	293.4	15.0	50.4	43.4	98.3	11.5	1065.9	1383.9	2449.7
5/7/15 9:55	290.5	15.0	51.0	43.0	98.3	11.5	1066.5	1383.2	2449.6
5/7/15 9:56	294.1	15.7	49.0	43.8	98.3	11.5	1067.1	1382.5	2449.5
5/7/15 9:57	298.8	14.3	51.0	43.6	98.3	11.6	1067.7	1381.8	2449.4
5/7/15 9:58	296.6	14.8	50.4	43.7	98.3	11.5	1068.3	1381.1	2449.3
5/7/15 9:59	298.6	14.6	49.0	43.3	98.3	11.5	1068.9	1380.4	2449.2
5/7/15 10:00	294.3	14.5	49.2	43.8	98.4	11.5	1069.5	1379.6	2449.1
5/7/15 10:01	294.5	15.2	50.9	43.9	98.4	11.5	1070.1	1378.9	2449.0
5/7/15 10:02	292.3	13.8	47.7	43.9	98.4	11.6	1070.7	1378.2	2448.9
5/7/15 10:03	294.9	14.6	46.9	43.4	98.5	11.6	1071.3	1377.5	2448.8
5/7/15 10:04	295.5	14.6	46.0	43.5	98.5	11.6	1071.9	1376.8	2448.7
5/7/15 10:05	296.8	13.9	45.1	43.0	98.6	11.6	1072.5	1376.1	2448.6
5/7/15 10:06	292.7	15.3	44.3	43.1	98.6	11.6	1073.1	1375.4	2448.5
5/7/15 10:07	292.6	14.3	48.0	43.2	98.7	11.7	1073.7	1374.7	2448.4
5/7/15 10:08	288.7	14.2	48.0	43.2	98.7	11.7	1074.3	1374.0	2448.3
5/7/15 10:09	291.5	15.0	48.0	43.7	98.8	11.9	1074.9	1373.3	2448.2
5/7/15 10:10	302.7	14.3	48.0	43.6	98.8	11.9	1075.5	1372.6	2448.1
5/7/15 10:11	300.1	14.9	50.7	43.5	98.9	11.7	1076.1	1371.9	2448.0
5/7/15 10:12	298.6	14.9	49.9	43.3	98.9	11.6	1076.7	1371.2	2447.9
5/7/15 10:13	298.9	14.4	49.3	43.2	99.0	11.5	1077.3	1370.5	2447.8
5/7/15 10:14	298.3	15.0	51.8	43.5	98.9	11.6	1077.9	1369.8	2447.7
5/7/15 10:15	295.5	14.7	51.0	43.9	98.4	11.7	1078.5	1369.1	2447.6
5/7/15 10:16	290.9	14.5	51.1	43.4	98.5	11.6	1079.1	1368.4	2447.5
5/7/15 10:17	293.1	14.4	50.1	43.7	98.5	11.7	1079.7	1367.6	2447.4
5/7/15 10:18	290.5	13.4	50.4	43.6	98.6	11.7	1080.3	1366.9	2447.3
5/7/15 10:19	293.6	13.7	51.5	42.9	98.6	11.8	1080.9	1366.2	2447.2
5/7/15 10:20	299.2	14.1	50.6	42.9	98.6	11.7	1081.5	1365.5	2447.1
5/7/15 10:21	298.3	13.9	49.7	43.2	98.7	11.6	1081.5	1364.8	2446.3
5/7/15 10:22	294.4	14.9	48.7	43.4	98.7	11.6	1080.9	1364.1	2445.0
5/7/15 10:23	292.2	14.3	51.3	43.1	98.8	11.6	1080.3	1364.1	2444.4
5/7/15 10:24	298.3	14.2	55.6	43.1	98.8	11.5	1079.7	1364.8	2444.5
5/7/15 10:25	298.0	15.2	53.9	43.4	98.9	11.6	1079.1	1365.4	2444.6
5/7/15 10:26	301.3	14.7	50.2	43.3	98.9	11.6	1078.6	1366.1	2444.7
5/7/15 10:27	300.2	14.9	47.8	43.2	98.9	11.6	1078.0	1366.8	2444.8
5/7/15 10:28	293.7	14.3	45.9	42.8	98.9	11.6	1077.4	1367.4	2444.8
5/7/15 10:29	290.0	14.5	44.1	43.3	98.7	11.6	1076.8	1368.1	2444.9
5/7/15 10:30	293.9	14.6	49.8	43.2	98.5	11.7	1076.2	1368.8	2445.0
5/7/15 10:31	289.1	14.4	49.5	43.3	98.4	11.8	1075.7	1369.4	2445.1
5/7/15 10:32	294.7	13.6	50.0	43.9	98.2	11.9	1075.1	1370.1	2445.2
5/7/15 10:33	294.2	15.0	53.8	43.8	98.1	11.9	1074.5	1370.8	2445.3
5/7/15 10:34	296.6	13.5	55.6	43.0	98.3	11.8	1073.9	1371.4	2445.4
5/7/15 10:35	292.4	14.4	51.7	42.9	98.3	11.8	1073.4	1372.1	2445.5
5/7/15 10:36	300.5	14.7	51.1	43.2	98.4	11.7	1072.8	1372.8	2445.5
5/7/15 10:37	298.8	14.2	50.6	43.2	98.5	11.7	1072.2	1373.4	2445.6
5/7/15 10:38	297.5	13.9	50.1	42.7	98.5	11.7	1071.6	1374.1	2445.7
5/7/15 10:39	295.0	14.0	49.5	42.8	98.6	11.6	1071.0	1374.8	2445.9
5/7/15 10:40	291.7	14.0	49.0	43.8	98.6	11.7	1070.8	1384.6	2455.4
5/7/15 10:41	297.2	15.1	48.5	43.3	98.7	11.6	1070.8	1389.2	2460.1
5/7/15 10:42	292.0	14.2	48.8	42.9	98.7	11.6	1070.9	1388.9	2459.8
5/7/15 10:43	294.4	14.2	52.0	42.9	98.8	11.6	1070.9	1388.6	2459.5
5/7/15 10:44	298.5	13.8	50.1	43.2	98.8	11.6	1070.9	1388.3	2459.2
5/7/15 10:45	297.7	14.3	48.0	43.9	98.9	11.6	1071.0	1387.9	2458.9
5/7/15 10:46	302.7	14.9	48.0	43.3	98.9	11.5	1071.0	1387.6	2458.6
5/7/15 10:47	299.3	14.9	48.0	43.0	99.0	11.5	1071.0	1387.3	2458.3
5/7/15 10:48	298.0	14.1	48.0	42.8	99.0	11.4	1071.1	1387.0	2458.0
5/7/15 10:49	303.5	14.4	48.0	42.8	99.1	11.4	1071.1	1386.7	2457.7
5/7/15 10:50	301.4	13.7	48.0	43.3	99.1	11.6	1071.1	1386.3	2457.5

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/7/15 10:51	302.0	14.5	48.0	43.1	99.1	11.5	1071.2	1386.0	2457.2
5/7/15 10:52	302.8	14.9	47.6	43.5	99.0	11.5	1071.2	1385.7	2456.9
5/7/15 10:53	302.3	14.1	44.6	43.2	98.9	11.7	1071.2	1385.4	2456.6
5/7/15 10:54	291.4	14.9	49.3	42.8	98.8	11.8	1071.2	1385.0	2456.3
5/7/15 10:55	295.2	14.0	50.5	42.6	98.8	11.9	1071.3	1384.7	2456.0
5/7/15 10:56	296.5	14.1	53.6	43.4	98.7	11.9	1071.3	1384.4	2455.7
5/7/15 10:57	297.0	14.9	55.3	43.0	98.6	12.0	1071.3	1384.1	2455.4
5/7/15 10:58	297.4	13.7	50.6	43.2	98.5	12.1	1071.4	1383.7	2455.1
5/7/15 10:59	298.9	14.4	52.0	43.4	98.5	12.1	1071.4	1383.4	2454.8
5/7/15 11:00	299.6	14.2	52.0	43.4	98.4	12.1	1071.4	1383.1	2454.5
5/7/15 11:01	299.0	14.2	54.8	43.7	98.3	12.2	1071.5	1382.8	2454.2
5/7/15 11:02	294.0	15.0	50.5	43.5	98.2	12.2	1071.5	1382.5	2453.9
5/7/15 11:03	293.1	14.0	48.4	43.3	98.2	12.3	1071.5	1382.1	2453.6
5/7/15 11:04	302.0	13.9	49.4	43.5	99.1	12.2	1071.5	1381.8	2453.4
5/7/15 11:05	300.0	14.8	50.3	43.2	99.1	12.2	1071.6	1381.5	2453.1
5/7/15 11:06	298.6	14.0	51.3	43.3	99.0	12.2	1071.6	1381.2	2452.8
5/7/15 11:07	299.9	14.6	49.6	43.5	98.9	12.2	1071.6	1380.8	2452.5
5/7/15 11:08	298.0	14.7	50.4	43.8	98.9	12.2	1071.7	1380.5	2452.2
5/7/15 11:09	287.4	13.8	51.7	43.7	98.8	12.1	1071.7	1380.2	2451.9
5/7/15 11:10	291.2	14.4	49.1	43.1	98.8	12.2	1071.7	1379.9	2451.6
5/7/15 11:11	291.8	13.5	49.9	43.3	98.7	12.2	1071.8	1379.5	2451.3
5/7/15 11:12	294.9	14.0	49.5	43.7	98.7	12.2	1071.8	1379.2	2451.0
5/7/15 11:13	296.5	14.5	50.4	42.9	98.6	12.1	1071.8	1378.9	2450.7
5/7/15 11:14	297.2	13.6	49.4	43.2	98.5	12.0	1071.8	1378.6	2450.4
5/7/15 11:15	301.2	14.1	48.3	42.7	98.5	12.0	1071.9	1378.3	2450.1
5/7/15 11:16	294.0	13.5	48.0	43.6	98.4	12.0	1071.9	1377.9	2449.8
5/7/15 11:17	297.1	13.6	48.3	43.2	98.4	11.9	1071.9	1377.6	2449.5
5/7/15 11:18	293.8	14.3	51.0	43.0	98.4	12.0	1072.0	1377.3	2449.3
5/7/15 11:19	298.0	13.4	51.7	43.6	98.6	12.1	1072.0	1377.0	2449.0
5/7/15 11:20	294.1	13.7	50.9	43.6	98.9	12.1	1072.0	1376.6	2448.7
5/7/15 11:21	290.3	14.7	51.7	43.6	99.1	12.0	1072.1	1376.3	2448.4
5/7/15 11:22	292.2	14.0	50.5	43.6	99.1	11.9	1072.1	1376.0	2448.1
5/7/15 11:23	296.4	14.4	49.3	43.8	98.4	11.9	1072.1	1375.7	2447.8
5/7/15 11:24	296.4	14.5	48.1	43.6	98.6	11.9	1072.1	1375.3	2447.5
5/7/15 11:25	299.6	14.2	48.0	43.2	98.7	11.9	1072.2	1375.0	2447.2
5/7/15 11:26	289.1	14.5	47.1	43.2	98.8	11.9	1072.2	1374.7	2446.9
5/7/15 11:27	295.1	13.2	45.9	43.8	99.0	11.9	1072.2	1374.4	2446.6
5/7/15 11:28	295.5	14.2	44.7	43.4	99.1	12.0	1072.3	1374.1	2446.3
5/7/15 11:29	295.2	14.6	47.4	43.3	98.6	12.0	1072.3	1373.7	2446.0
5/7/15 11:30	297.1	13.7	44.4	43.7	98.0	12.0	1072.3	1373.4	2445.7
5/7/15 11:31	292.3	14.8	49.0	43.4	98.8	11.9	1072.4	1373.1	2445.4
5/7/15 11:32	290.7	14.1	50.7	43.2	98.8	11.8	1072.4	1373.4	2445.8
5/7/15 11:33	289.8	13.8	49.6	43.5	98.8	11.9	1072.4	1374.4	2446.9
5/7/15 11:34	290.5	14.8	51.5	43.1	98.8	11.8	1072.5	1375.5	2447.9
5/7/15 11:35	290.2	13.1	50.8	43.6	98.9	11.9	1072.5	1376.5	2449.0
5/7/15 11:36	303.7	13.8	50.0	43.7	98.9	12.0	1072.5	1377.5	2450.0
5/7/15 11:37	296.6	15.4	49.3	44.1	98.9	12.0	1072.5	1378.5	2451.0
5/7/15 11:38	299.6	13.5	48.6	43.6	98.9	11.8	1072.6	1379.5	2452.1
5/7/15 11:39	300.3	14.3	47.1	43.0	98.1	11.7	1072.6	1380.5	2453.1
5/7/15 11:40	293.5	14.5	47.4	43.2	98.3	11.7	1072.5	1381.5	2454.1
5/7/15 11:41	289.6	14.0	54.4	43.5	98.6	11.6	1071.4	1382.5	2453.9
5/7/15 11:42	291.9	14.5	51.3	43.7	98.8	11.6	1070.3	1383.5	2453.8
5/7/15 11:43	297.5	13.6	49.7	43.7	99.0	11.6	1069.1	1384.5	2453.7
5/7/15 11:44	299.8	13.9	48.1	43.8	98.7	11.5	1068.0	1385.6	2453.5
5/7/15 11:45	298.4	14.0	50.3	43.6	98.3	11.5	1066.8	1386.6	2453.4
5/7/15 11:46	301.2	13.6	48.3	43.5	98.6	11.5	1065.7	1387.6	2453.3
5/7/15 11:47	295.5	14.8	52.0	43.3	98.9	11.5	1064.5	1387.1	2451.6
5/7/15 11:48	286.9	13.2	52.0	43.4	99.1	11.6	1063.5	1386.6	2450.1
5/7/15 11:49	298.8	13.8	52.0	43.9	98.9	11.6	1063.6	1386.2	2449.8
5/7/15 11:50	291.1	14.7	52.0	42.6	98.8	11.7	1063.8	1385.7	2449.5
5/7/15 11:51	277.1	13.0	53.0	43.0	99.0	11.7	1063.9	1385.2	2449.1
5/7/15 11:52	293.7	13.3	54.3	43.3	99.3	11.7	1064.0	1384.8	2448.8

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/7/15 11:53	280.8	14.6	55.6	42.7	99.2	11.7	1064.2	1384.3	2448.5
5/7/15 11:54	291.8	14.0	53.4	43.3	98.9	11.7	1064.3	1383.8	2448.2
5/7/15 11:55	290.1	14.0	54.3	43.4	98.9	11.5	1064.4	1383.4	2447.8
5/7/15 11:56	278.3	15.5	55.4	43.2	98.9	11.4	1064.6	1382.9	2447.5
5/7/15 11:57	304.4	14.1	48.0	43.6	98.9	11.4	1064.7	1382.5	2447.2
5/7/15 11:58	307.4	16.3	48.0	43.1	98.9	11.4	1064.9	1382.0	2446.8
5/7/15 11:59	310.1	15.6	47.3	43.2	98.9	11.2	1065.0	1381.5	2446.5
5/7/15 12:00	297.8	15.5	45.8	43.1	98.8	11.0	1065.1	1381.1	2446.2
5/7/15 12:01	295.0	16.4	44.2	42.8	98.8	10.9	1065.3	1380.6	2445.9
5/7/15 12:02	308.7	14.8	49.9	43.8	98.8	10.9	1065.4	1380.1	2445.5
5/7/15 12:03	303.9	15.9	51.5	43.8	99.4	10.9	1065.5	1379.7	2445.2
5/7/15 12:04	306.8	15.1	49.7	43.5	98.9	10.9	1065.7	1379.2	2444.9
5/7/15 12:05	310.8	14.8	49.6	43.3	98.2	10.8	1065.8	1378.7	2444.5
5/7/15 12:06	311.1	15.2	52.0	42.7	98.2	10.8	1066.0	1378.3	2444.2
5/7/15 12:07	301.2	14.5	52.0	43.2	98.2	11.0	1066.1	1377.8	2443.9
5/7/15 12:08	303.9	14.6	52.0	43.7	98.3	11.3	1066.2	1377.3	2443.6
5/7/15 12:09	300.2	14.5	52.0	43.1	98.3	11.5	1066.4	1376.9	2443.2
5/7/15 12:10	306.6	14.2	52.0	43.4	99.5	11.6	1066.5	1376.4	2442.9
5/7/15 12:11	306.5	14.2	52.0	43.3	99.2	11.8	1066.6	1375.9	2442.6
5/7/15 12:12	301.8	14.8	52.0	0.0	98.8	11.8	1066.8	1375.5	2442.3
5/7/15 12:13	298.2	13.4	52.0	0.0	98.4	12.0	1066.9	1375.0	2441.9
5/7/15 12:14	299.6	14.2	52.0	4.7	98.4	12.2	1067.0	1374.5	2441.6
5/7/15 12:15	293.1	13.0	52.0	21.8	98.4	12.3	1067.2	1374.1	2441.3
5/7/15 12:16	292.3	13.7	51.5	25.0	98.5	12.3	1067.3	1373.6	2440.9
5/7/15 12:17	294.7	13.7	51.5	25.3	98.6	12.3	1067.5	1373.2	2440.6
5/7/15 12:18	293.4	13.4	50.9	33.1	98.7	12.3	1067.6	1373.2	2440.8
5/7/15 12:19	297.1	12.7	49.8	41.6	98.8	12.4	1067.7	1373.8	2441.6
5/7/15 12:20	300.7	12.9	50.5	44.4	98.9	12.4	1067.9	1374.4	2442.3
5/7/15 12:21	300.2	12.8	51.8	43.9	99.0	12.4	1068.0	1375.0	2443.0
5/7/15 12:22	296.2	13.9	50.0	44.6	99.0	12.4	1068.1	1375.6	2443.8
5/7/15 12:23	297.1	13.5	49.5	44.0	99.1	12.4	1068.3	1376.2	2444.5
5/7/15 12:24	298.3	13.9	52.0	44.8	99.2	12.4	1068.4	1376.8	2445.2
5/7/15 12:25	295.5	13.5	52.0	44.5	99.0	12.3	1068.6	1377.4	2446.0
5/7/15 12:26	294.9	13.2	52.0	44.4	98.4	12.4	1068.7	1378.0	2446.7
5/7/15 12:27	297.9	14.2	52.0	44.8	98.6	12.4	1068.8	1378.6	2447.4
5/7/15 12:28	294.4	13.6	52.0	44.9	98.9	12.4	1069.0	1379.2	2448.2
5/7/15 12:29	293.7	13.1	52.0	44.0	98.7	12.5	1069.1	1379.8	2448.9
5/7/15 12:30	289.5	13.6	52.0	44.7	98.8	12.5	1069.2	1380.4	2449.6
5/7/15 12:31	297.5	12.7	52.0	44.1	99.1	12.5	1069.4	1381.0	2450.4
5/7/15 12:32	293.0	13.5	51.8	45.1	98.8	12.4	1069.5	1381.6	2451.1
5/7/15 12:33	292.4	13.8	50.3	44.3	98.7	12.4	1069.6	1382.2	2451.8
5/7/15 12:34	295.5	12.8	48.7	45.1	98.5	12.5	1069.8	1382.8	2452.6
5/7/15 12:35	287.5	14.2	52.0	44.3	98.7	12.4	1069.9	1383.4	2453.3
5/7/15 12:36	290.3	12.5	52.0	44.1	98.8	12.4	1070.1	1384.0	2454.0
5/7/15 12:37	295.6	13.4	52.0	44.8	98.9	12.4	1070.2	1384.6	2454.8
5/7/15 12:38	296.9	13.9	52.0	45.3	98.9	12.4	1070.3	1385.2	2455.5
5/7/15 12:39	301.2	13.0	52.0	44.5	99.0	12.3	1070.5	1385.8	2456.3
5/7/15 12:40	302.1	13.7	52.0	44.4	98.9	12.3	1070.6	1386.4	2457.0
5/7/15 12:41	301.3	13.4	52.0	44.5	98.9	12.1	1070.7	1387.0	2457.7
5/7/15 12:42	302.0	12.9	52.0	44.3	98.9	11.9	1070.3	1387.6	2457.8
5/7/15 12:43	303.7	14.0	52.0	44.3	98.9	11.9	1069.4	1387.4	2456.7
5/7/15 12:44	298.7	13.2	52.0	44.6	98.9	11.9	1068.4	1387.2	2455.6
5/7/15 12:45	293.3	13.0	52.0	44.6	98.9	11.7	1067.5	1387.0	2454.5
5/7/15 12:46	296.1	13.1	52.0	44.6	98.8	11.7	1066.6	1386.8	2453.4
5/7/15 12:47	300.2	13.0	52.0	44.6	98.8	11.6	1065.7	1386.6	2452.3
5/7/15 12:48	296.9	13.5	52.0	44.5	98.8	11.6	1064.8	1386.4	2451.1
5/7/15 12:49	295.8	13.4	51.8	44.9	98.8	11.5	1063.9	1386.1	2450.0
5/7/15 12:50	297.9	12.7	51.3	44.5	98.8	11.5	1063.0	1385.9	2448.9
5/7/15 12:51	299.1	13.6	50.7	44.3	98.8	11.6	1062.0	1385.7	2447.8
5/7/15 12:52	297.5	13.1	50.2	44.4	98.9	11.7	1061.7	1385.5	2447.3
5/7/15 12:53	296.5	13.5	49.7	45.2	98.9	11.7	1061.9	1385.3	2447.2
5/7/15 12:54	296.9	13.3	49.2	44.4	99.0	11.7	1062.0	1385.1	2447.1

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/7/15 12:55	291.0	12.8	48.7	45.0	99.1	11.8	1062.2	1384.9	2447.1
5/7/15 12:56	296.5	13.4	48.2	44.1	99.1	11.9	1062.3	1384.7	2447.0
5/7/15 12:57	297.3	13.2	51.2	44.3	99.2	12.0	1062.4	1384.5	2447.0
5/7/15 12:58	294.7	13.0	50.4	44.5	99.3	11.9	1062.6	1384.3	2446.9
5/7/15 12:59	296.1	13.7	51.4	44.9	99.3	11.9	1062.7	1384.1	2446.8
5/7/15 13:00	296.0	12.6	49.2	44.3	99.2	11.9	1062.9	1383.9	2446.8
5/7/15 13:01	293.1	13.5	50.7	44.6	98.6	12.0	1063.0	1383.7	2446.7
5/7/15 13:02	297.4	13.8	50.6	44.6	98.6	12.0	1063.1	1383.5	2446.7
5/7/15 13:03	301.9	13.3	51.4	44.5	98.6	12.0	1063.3	1383.3	2446.6
5/7/15 13:04	295.9	13.9	48.0	45.0	98.6	12.0	1063.4	1383.1	2446.5
5/7/15 13:05	290.9	13.6	48.0	44.9	98.6	12.0	1063.6	1382.9	2446.5
5/7/15 13:06	296.2	12.1	49.0	44.5	98.6	12.0	1063.7	1382.7	2446.4
5/7/15 13:07	298.0	13.4	50.2	44.4	98.6	12.0	1063.9	1382.5	2446.3
5/7/15 13:08	301.8	12.5	51.4	44.9	98.5	12.0	1064.0	1382.3	2446.3
5/7/15 13:09	299.6	13.8	50.8	44.2	98.5	11.9	1064.1	1382.1	2446.2
5/7/15 13:10	301.8	14.0	48.2	44.7	98.5	11.8	1064.3	1381.9	2446.2
5/7/15 13:11	294.6	13.2	50.8	44.4	98.5	11.8	1064.4	1381.7	2446.1
5/7/15 13:12	298.7	13.6	49.0	44.8	98.5	11.9	1064.6	1381.5	2446.0
5/7/15 13:13	293.4	12.6	48.2	44.9	98.5	11.9	1064.7	1381.3	2446.0
5/7/15 13:14	298.3	12.3	50.5	44.1	98.6	11.9	1064.9	1381.1	2445.9
5/7/15 13:15	299.9	12.9	49.4	45.0	98.6	11.9	1065.0	1380.9	2445.9
5/7/15 13:16	300.6	12.7	50.5	44.5	98.6	11.9	1065.1	1380.7	2445.8
5/7/15 13:17	299.7	13.1	49.8	44.4	98.6	11.8	1065.3	1380.5	2445.7
5/7/15 13:18	302.4	13.9	48.0	44.7	98.6	11.8	1065.4	1380.2	2445.7
5/7/15 13:19	298.0	12.6	48.0	44.7	98.6	11.9	1065.6	1380.0	2445.6
5/7/15 13:20	302.9	13.5	48.0	44.6	98.6	12.1	1065.7	1379.8	2445.6
5/7/15 13:21	300.9	13.3	48.0	43.9	98.6	12.2	1065.9	1379.6	2445.5
5/7/15 13:22	299.9	13.4	47.9	44.4	98.7	12.1	1066.0	1379.4	2445.4
5/7/15 13:23	289.6	14.0	46.9	44.3	98.7	12.0	1066.1	1379.2	2445.4
5/7/15 13:24	280.4	13.6	45.8	44.2	98.7	12.1	1066.3	1379.0	2445.3
5/7/15 13:25	292.8	13.8	44.8	44.3	98.7	12.1	1066.4	1378.8	2445.2
5/7/15 13:26	290.9	15.3	47.8	44.8	98.7	12.1	1066.6	1378.6	2445.2
5/7/15 13:27	289.3	13.6	46.3	44.3	98.7	11.9	1066.7	1378.4	2445.1
5/7/15 13:28	287.8	15.3	44.8	44.4	98.7	11.8	1066.8	1378.2	2445.1
5/7/15 13:29	287.2	14.3	47.7	44.2	98.8	11.8	1067.0	1378.0	2445.0
5/7/15 13:30	293.8	14.1	52.0	45.2	98.8	11.9	1067.1	1377.8	2444.9
5/7/15 13:31	298.1	15.1	51.5	44.8	98.8	11.8	1067.3	1377.6	2444.9
5/7/15 13:32	285.3	15.8	49.8	44.2	98.8	11.6	1067.4	1377.4	2444.8
5/7/15 13:33	300.6	14.5	49.4	44.9	98.8	11.5	1067.6	1377.2	2444.8
5/7/15 13:34	283.6	15.3	51.1	44.8	98.8	11.4	1067.7	1377.0	2444.7
5/7/15 13:35	298.5	14.1	49.4	44.6	98.8	11.4	1067.8	1376.8	2444.6
5/7/15 13:36	303.1	15.3	50.7	44.6	98.6	11.4	1068.0	1376.6	2444.6
5/7/15 13:37	291.4	15.1	48.0	44.4	98.4	11.4	1068.1	1378.7	2446.8
5/7/15 13:38	296.8	14.2	48.0	44.6	98.3	11.4	1068.3	1380.7	2449.0
5/7/15 13:39	290.3	15.2	51.2	44.8	98.4	11.5	1068.4	1382.8	2451.2
5/7/15 13:40	297.0	14.0	51.5	44.5	98.6	11.4	1068.6	1384.8	2453.4
5/7/15 13:41	281.0	13.6	50.7	44.6	98.7	11.5	1068.7	1386.9	2455.6
5/7/15 13:42	294.0	14.9	50.0	45.0	98.5	11.6	1068.8	1389.0	2457.8
5/7/15 13:43	297.8	13.6	49.3	44.9	98.3	11.8	1068.7	1391.0	2459.7
5/7/15 13:44	289.9	13.7	48.5	44.6	98.0	11.8	1065.0	1393.1	2458.1
5/7/15 13:45	290.8	14.1	48.0	44.6	97.8	11.6	1061.4	1392.7	2454.0
5/7/15 13:46	301.8	14.1	48.0	44.2	98.2	11.7	1057.7	1392.3	2450.0
5/7/15 13:47	296.8	14.5	48.3	44.5	98.8	11.8	1054.3	1391.8	2446.2
5/7/15 13:48	288.4	13.9	50.6	44.6	98.7	11.8	1054.7	1391.4	2446.1
5/7/15 13:49	297.5	14.8	51.9	44.2	98.5	11.7	1055.0	1391.1	2446.1
5/7/15 13:50	295.0	14.3	50.0	44.2	98.5	11.8	1055.3	1390.8	2446.1
5/7/15 13:51	287.3	14.3	48.1	44.7	98.5	11.8	1055.7	1390.5	2446.2
5/7/15 13:52	299.2	14.6	49.2	45.0	98.5	11.8	1056.0	1390.3	2446.3
5/7/15 13:53	312.1	14.8	49.2	44.0	98.5	11.8	1056.3	1390.0	2446.3
5/7/15 13:54	315.6	14.4	48.0	44.7	98.5	11.9	1056.6	1389.7	2446.4
5/7/15 13:55	303.8	15.5	48.0	44.5	98.6	11.9	1057.0	1389.5	2446.4
5/7/15 13:56	290.8	14.2	48.9	44.3	98.6	11.8	1057.3	1389.2	2446.5

Line 3 Waste Gas Stack (SV103) Process Data

Timestamp	AL613151 030-03-0 TOTAL TONS TO 031	AI614065 037-01-1 ROLL FEEDER UNDERSIZE	AI617Q01 000-03-0 WOOD FLOW	AI612013 242-03-1 PH BURNER GAS FLOW	AC614017 252-03-1 KILN BURNER LINE GAS	AI616019 247-03-1 Scrubber dP	AI616024 247-03-1 Upper Flow	AI616025 247-03-1 Lower Flow	Total Flow
5/7/15 13:57	295.8	13.9	50.0	44.2	98.6	11.8	1057.6	1388.9	2446.5
5/7/15 13:58	295.3	14.4	51.2	44.3	98.6	11.9	1057.9	1388.6	2446.6
5/7/15 13:59	302.9	13.8	51.2	44.4	98.6	12.0	1058.3	1388.4	2446.6
5/7/15 14:00	297.7	13.6	49.5	44.5	98.6	12.1	1058.6	1388.1	2446.7
5/7/15 14:01	287.4	13.7	52.0	44.7	98.7	12.1	1058.9	1387.8	2446.7
5/7/15 14:02	293.8	13.2	52.0	44.9	98.7	12.2	1059.2	1387.5	2446.8
5/7/15 14:03	301.1	14.4	52.0	44.1	98.7	12.2	1059.6	1387.3	2446.8
5/7/15 14:04	302.9	12.9	50.9	44.5	98.7	12.2	1059.9	1387.0	2446.9
5/7/15 14:05	295.0	13.8	48.5	45.3	98.4	12.2	1060.2	1386.7	2446.9
5/7/15 14:06	297.7	13.5	50.5	44.5	98.5	12.2	1060.6	1386.4	2447.0
5/7/15 14:07	299.3	13.8	48.1	45.1	98.6	12.3	1060.9	1386.2	2447.1
5/7/15 14:08	304.7	14.0	49.3	44.2	98.7	12.2	1061.2	1385.9	2447.1
5/7/15 14:09	301.2	13.7	51.4	44.6	98.7	12.1	1061.5	1385.6	2447.2
5/7/15 14:10	292.9	13.3	49.9	43.9	98.7	12.1	1061.9	1385.3	2447.2
5/7/15 14:11	289.2	14.1	48.4	44.5	98.7	12.2	1062.2	1385.1	2447.3
5/7/15 14:12	290.8	13.1	52.3	44.0	98.7	12.4	1062.5	1384.8	2447.3
5/7/15 14:13	293.1	13.0	53.4	45.0	98.8	12.3	1062.8	1384.5	2447.4
5/7/15 14:14	282.4	14.4	54.5	44.9	99.0	12.4	1063.2	1384.3	2447.4
5/7/15 14:15	287.7	14.0	55.7	44.6	99.0	12.4	1063.5	1384.0	2447.5
5/7/15 14:16	298.2	13.7	53.3	45.1	98.3	12.3	1063.8	1383.7	2447.5
5/7/15 14:17	288.1	13.2	50.7	44.8	98.4	12.1	1064.2	1383.4	2447.6
5/7/15 14:18	283.6	13.7	50.5	44.8	98.9	11.9	1064.5	1383.2	2447.6
5/7/15 14:19	298.6	14.4	52.0	45.0	99.2	11.9	1064.8	1382.9	2447.7
5/7/15 14:20	293.8	12.2	52.0	44.7	99.2	11.9	1065.1	1382.6	2447.7

Air Performance Test Form

Operating Data Summary for Process Sources

Facility Information (please print)

Company Name: U. S. Steel Corporation

Equipment ID No: SV118

Test date(s): 05/08/15

Equipment and Operating Data

- Process Equipment Description: Line 4 Waste Gas Stack
- Were the process and control equipment operated consistent with normal procedures? ☒ Yes ☐ No If no, explain: _____
- 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.
- Date(s) and procedure(s) of last maintenance/cleaning within 6 months:
☒ Remains unchanged from info. provided in test plan
- 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	Run 4	Average
Greenball Feed Rate, LTPH	518	516	518	--	517
Fired Pellet Production, LTPH	393	391	391	--	391
Fuel Input (list units) Wood, MBTUH	103.2	103.3	103.2	--	103.2
Fuel Input (list units) Gas, MBTUH	178.9	178.3	177.7	--	178.3
Heat Input (10 ⁶ British thermal units/hour) Total	282.0	281.6	280.9	--	281.5

- 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): DP (in. w.c.) and feed rate (gpm and psig)			· Baghouse, Cyclone, and Multi-clone: DP (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	Run 4	Average
Scrubber dP, in. H2O	10.6	10.7	10.7	--	10.7
Scrubber water flow rate, GPM	2,901	2,896	2,897	--	2898

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

U. S. Steel Corporation
 Minntac
 Mountain Iron, Minnesota

Line 4 Waste Gas Stack (SV118)
 Process Data Summary

Barr Engineering Co.
 June 18, 2015

5/8/2015

Run	Start Time	End Time	Feed Rates LTPH		Prod. Rate LTPH	Wood							
			Green ball	To Grate		Wood lb/min	Wood MMBTU/ton	Wood MBTUH	Gas MBTUH		Total MBTUH	dP	Water Flow
					Grate				Kiln				
1	7:57	10:06	518	473	393	204	16.9	103.2	91.9	87.0	282.0	10.6	2,901
2	10:38	12:50	516	471	391	204	16.9	103.3	91.6	86.7	281.6	10.7	2,896
3	13:18	15:30	518	471	391	204	16.9	103.2	91.2	86.4	280.9	10.7	2,897

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 7:50	527.1	46.1	205.9	91.8	87.4	712.8	2899.5	9.4
5/8/15 7:51	521.0	46.8	200.4	91.8	87.2	712.5	2902.2	10.4
5/8/15 7:52	504.2	46.1	206.9	91.8	87.2	712.2	2894.4	11.0
5/8/15 7:53	502.5	46.0	200.9	91.8	86.8	721.3	2895.1	10.7
5/8/15 7:54	515.9	45.6	201.2	91.8	86.0	730.6	2895.5	10.7
5/8/15 7:55	512.5	43.7	207.8	91.8	85.9	723.2	2889.9	9.9
5/8/15 7:56	525.5	45.5	206.7	91.8	85.8	717.6	2890.0	9.6
5/8/15 7:57	511.1	44.6	201.8	91.8	86.1	714.8	2896.9	10.0
5/8/15 7:58	515.4	46.7	203.3	91.9	86.3	714.9	2895.5	11.0
5/8/15 7:59	512.7	45.9	197.4	91.9	86.3	715.0	2892.9	11.3
5/8/15 8:00	518.8	46.1	203.8	91.9	87.1	715.2	2877.4	11.2
5/8/15 8:01	521.5	45.6	202.6	91.9	87.3	715.3	2868.0	10.5
5/8/15 8:02	523.1	45.8	201.4	91.9	87.1	715.4	2875.0	9.5
5/8/15 8:03	529.0	44.9	201.6	91.9	87.0	715.5	2911.5	8.9
5/8/15 8:04	522.1	45.9	201.5	91.9	86.8	715.6	2935.8	9.3
5/8/15 8:05	509.1	45.0	202.6	91.9	87.3	715.7	2927.0	9.6
5/8/15 8:06	515.2	44.9	200.4	91.9	87.4	715.8	2863.1	9.9
5/8/15 8:07	513.8	45.2	203.7	91.9	87.4	715.9	2927.9	10.7
5/8/15 8:08	524.0	44.8	203.6	91.9	86.8	716.0	2909.7	10.6
5/8/15 8:09	537.9	43.9	201.2	91.9	87.1	716.2	2856.1	10.2
5/8/15 8:10	530.2	44.9	207.2	91.9	87.1	716.3	2894.0	9.8
5/8/15 8:11	515.1	46.3	206.8	91.9	87.3	716.4	2890.9	9.7
5/8/15 8:12	511.6	46.5	203.7	91.9	87.3	716.5	2900.3	10.3
5/8/15 8:13	529.4	44.1	206.6	91.9	87.3	716.6	2946.9	10.9
5/8/15 8:14	513.7	45.1	206.9	91.9	87.4	716.7	2898.8	11.2
5/8/15 8:15	509.6	45.1	207.7	91.9	87.2	716.8	2905.9	10.9
5/8/15 8:16	518.3	44.5	205.6	91.9	87.1	716.9	2916.9	10.6
5/8/15 8:17	523.0	45.2	201.3	91.9	87.2	717.0	2930.7	9.8
5/8/15 8:18	526.6	45.4	200.3	91.9	87.2	717.1	2911.5	9.6
5/8/15 8:19	519.7	44.9	205.5	91.9	87.3	717.3	2926.9	9.8
5/8/15 8:20	519.7	46.0	201.0	91.9	87.2	717.4	2915.1	10.4
5/8/15 8:21	522.9	46.2	206.7	91.9	87.3	717.5	2911.7	11.1
5/8/15 8:22	519.2	45.7	202.3	91.9	87.5	717.6	2902.2	11.1
5/8/15 8:23	525.2	44.0	204.0	91.9	87.2	717.7	2902.2	10.9
5/8/15 8:24	513.7	44.9	204.3	91.9	87.3	717.8	2901.2	10.7
5/8/15 8:25	511.2	46.0	200.4	91.9	87.1	717.9	2900.3	10.2
5/8/15 8:26	516.3	45.9	203.1	91.9	86.9	717.9	2897.7	10.4
5/8/15 8:27	509.7	45.9	200.4	91.9	86.7	717.7	2890.2	10.7
5/8/15 8:28	508.0	45.5	203.8	91.9	86.2	717.6	2885.3	11.2
5/8/15 8:29	514.2	45.2	205.3	92.0	86.6	717.4	2902.2	11.4
5/8/15 8:30	520.2	45.1	202.2	92.0	86.3	717.2	2898.3	11.3
5/8/15 8:31	514.1	45.5	203.0	92.0	86.6	717.0	2891.9	10.5
5/8/15 8:32	518.4	46.8	203.5	92.0	86.7	716.9	2900.1	9.7
5/8/15 8:33	519.9	45.8	207.4	92.0	86.7	716.7	2903.1	9.7
5/8/15 8:34	515.5	45.7	207.0	92.0	86.5	716.5	2885.2	9.7
5/8/15 8:35	518.2	45.3	206.5	92.0	86.7	716.3	2909.6	10.4
5/8/15 8:36	507.9	45.1	204.3	92.0	86.6	716.2	2904.3	10.8
5/8/15 8:37	516.0	46.3	200.9	92.0	86.8	716.0	2893.8	10.7
5/8/15 8:38	525.5	45.7	204.3	92.0	86.6	715.8	2894.1	10.5
5/8/15 8:39	526.5	45.8	202.6	92.0	87.2	715.7	2901.4	10.0
5/8/15 8:40	534.7	47.3	207.6	92.0	87.1	715.5	2906.3	9.8
5/8/15 8:41	512.5	46.9	200.4	92.0	87.5	715.3	2898.6	10.3
5/8/15 8:42	513.8	46.9	200.3	92.0	87.2	715.1	2907.8	11.0
5/8/15 8:43	522.2	45.5	207.2	92.0	87.3	715.0	2928.4	11.2
5/8/15 8:44	519.2	45.4	200.7	92.0	87.2	714.8	2914.7	11.2

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 8:45	513.6	46.2	204.2	92.0	87.3	714.6	2899.9	11.1
5/8/15 8:46	518.5	45.6	206.9	92.0	87.3	714.4	2907.1	10.0
5/8/15 8:47	526.3	45.4	204.1	92.0	87.3	714.3	2901.4	9.3
5/8/15 8:48	521.0	45.0	206.6	92.0	87.4	714.1	2898.7	9.9
5/8/15 8:49	523.7	44.3	201.3	92.0	87.4	713.9	2906.6	10.4
5/8/15 8:50	524.6	45.1	204.6	92.0	87.3	713.8	2904.2	11.1
5/8/15 8:51	509.4	45.6	206.5	92.0	87.0	713.6	2902.1	11.2
5/8/15 8:52	518.7	44.8	202.9	92.0	87.2	713.4	2904.6	11.2
5/8/15 8:53	512.7	44.4	200.2	92.0	87.2	713.2	2907.6	10.7
5/8/15 8:54	507.5	44.8	202.2	92.0	87.3	713.1	2907.5	10.1
5/8/15 8:55	505.0	45.1	205.8	92.0	86.3	712.9	2898.8	10.1
5/8/15 8:56	520.6	44.0	202.5	92.0	86.0	712.7	2901.9	10.9
5/8/15 8:57	513.8	44.2	203.6	92.0	86.5	712.5	2901.1	11.3
5/8/15 8:58	513.6	45.9	203.8	92.0	86.3	712.4	2895.5	11.4
5/8/15 8:59	515.7	45.7	200.8	92.0	86.6	712.2	2908.2	11.4
5/8/15 9:00	516.1	44.9	200.1	92.1	86.4	712.0	2894.3	10.5
5/8/15 9:01	516.7	44.1	202.2	92.1	86.3	718.0	2902.9	9.8
5/8/15 9:02	511.8	44.6	196.4	92.1	86.5	718.0	2902.9	9.6
5/8/15 9:03	525.9	43.7	200.6	92.1	86.5	717.9	2865.5	9.9
5/8/15 9:04	527.6	43.2	207.8	92.1	87.3	717.9	2859.0	10.1
5/8/15 9:05	516.1	45.3	200.1	92.1	87.1	717.9	2862.5	10.4
5/8/15 9:06	529.1	44.6	203.4	92.1	87.6	717.9	2878.2	10.6
5/8/15 9:07	519.6	44.7	203.9	92.1	87.6	717.9	2920.1	10.5
5/8/15 9:08	519.0	46.3	203.5	92.1	87.2	717.9	2919.6	10.1
5/8/15 9:09	516.5	44.8	202.9	92.1	87.2	717.8	2918.5	9.8
5/8/15 9:10	518.7	44.6	203.4	92.1	87.4	717.8	2921.1	9.9
5/8/15 9:11	510.9	45.5	202.2	92.1	87.5	717.8	2901.1	10.8
5/8/15 9:12	517.9	44.4	207.3	92.1	87.5	717.8	2910.8	11.3
5/8/15 9:13	520.3	45.3	207.3	92.1	87.4	717.8	2908.9	11.4
5/8/15 9:14	511.8	44.8	207.1	92.1	87.3	717.8	2903.4	11.0
5/8/15 9:15	512.7	44.9	207.0	92.0	86.9	721.9	2905.2	10.7
5/8/15 9:16	521.5	44.6	207.3	91.8	86.5	720.7	2909.3	10.2
5/8/15 9:17	523.6	44.0	205.6	91.6	87.2	719.5	2906.5	10.0
5/8/15 9:18	526.3	45.0	203.9	91.5	87.2	718.3	2909.2	10.8
5/8/15 9:19	511.2	45.1	203.7	91.5	87.2	717.0	2891.0	11.2
5/8/15 9:20	513.9	45.2	201.0	91.5	87.4	715.8	2895.0	11.6
5/8/15 9:21	514.7	45.0	207.9	91.5	87.0	714.6	2900.1	11.3
5/8/15 9:22	512.9	44.0	203.2	91.5	86.9	713.3	2898.5	11.3
5/8/15 9:23	510.3	46.0	204.5	91.5	86.7	712.1	2906.7	10.4
5/8/15 9:24	513.0	44.5	206.4	91.5	86.9	710.9	2898.9	10.4
5/8/15 9:25	523.0	45.4	202.4	91.5	86.6	709.7	2900.4	10.9
5/8/15 9:26	515.3	45.2	206.8	91.5	86.6	708.4	2889.7	11.3
5/8/15 9:27	519.3	45.4	203.3	91.5	86.6	707.2	2889.0	11.4
5/8/15 9:28	521.7	44.6	197.8	91.5	86.6	706.0	2905.2	11.5
5/8/15 9:29	514.7	44.5	201.4	91.6	86.6	704.8	2907.4	11.1
5/8/15 9:30	517.2	44.0	200.7	91.7	86.6	703.5	2890.7	9.9
5/8/15 9:31	514.6	44.0	206.5	91.8	86.8	702.3	2904.2	9.7
5/8/15 9:32	526.0	44.9	203.0	91.8	87.2	701.1	2898.5	9.9
5/8/15 9:33	520.3	44.5	205.1	91.8	87.6	701.3	2904.8	10.4
5/8/15 9:34	526.7	45.5	202.9	91.8	87.5	701.5	2905.2	11.1
5/8/15 9:35	524.3	45.7	202.3	91.8	87.2	701.7	2887.9	10.9
5/8/15 9:36	511.9	45.1	206.8	91.8	87.2	701.9	2908.6	10.9
5/8/15 9:37	514.8	45.2	202.8	91.8	87.0	702.1	2909.3	10.6
5/8/15 9:38	517.9	44.9	196.8	91.8	87.0	702.3	2886.3	9.9
5/8/15 9:39	514.0	45.1	196.9	91.8	87.2	702.5	2897.3	10.2

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 9:40	519.1	46.0	201.4	91.8	86.8	702.7	2897.2	10.8
5/8/15 9:41	523.6	44.5	211.3	91.8	87.1	703.0	2894.1	11.6
5/8/15 9:42	510.9	45.2	205.3	91.8	87.2	703.2	2901.6	11.4
5/8/15 9:43	496.1	45.2	203.6	91.8	86.8	703.4	2889.0	11.3
5/8/15 9:44	517.3	44.4	198.3	91.8	86.1	703.6	2901.7	11.1
5/8/15 9:45	521.8	44.0	205.7	91.8	86.4	703.8	2899.4	10.1
5/8/15 9:46	516.6	45.0	203.0	91.8	86.8	704.0	2895.6	9.9
5/8/15 9:47	515.2	45.9	205.1	91.8	86.2	704.2	2891.8	10.5
5/8/15 9:48	523.6	43.8	205.1	91.8	85.8	704.4	2904.4	10.8
5/8/15 9:49	526.1	45.0	203.5	91.8	86.4	704.6	2906.1	11.2
5/8/15 9:50	507.3	44.9	203.7	91.8	86.6	704.8	2894.3	11.1
5/8/15 9:51	512.7	45.6	202.5	91.8	86.7	705.0	2905.2	10.9
5/8/15 9:52	542.6	45.2	203.5	91.8	87.0	705.2	2909.0	10.6
5/8/15 9:53	523.2	44.2	202.3	91.8	87.5	705.2	2905.0	10.2
5/8/15 9:54	530.2	46.6	205.5	91.8	87.2	705.1	2911.2	10.7
5/8/15 9:55	525.3	45.0	206.5	91.8	87.1	705.0	2905.3	11.2
5/8/15 9:56	526.0	44.2	205.7	91.8	87.3	705.0	2902.5	11.3
5/8/15 9:57	512.6	44.4	198.3	91.8	87.5	704.9	2900.2	11.2
5/8/15 9:58	522.6	44.7	206.1	91.8	87.4	704.8	2897.1	11.1
5/8/15 9:59	505.0	43.7	202.3	91.8	87.2	704.8	2906.0	10.5
5/8/15 10:00	519.4	45.5	205.6	91.8	86.5	704.7	2904.3	10.1
5/8/15 10:01	520.5	44.3	202.4	91.8	86.5	704.7	2900.1	10.4
5/8/15 10:02	519.1	45.5	202.4	91.8	87.1	704.6	2909.2	10.7
5/8/15 10:03	509.4	43.9	200.4	91.8	87.0	704.5	2894.8	11.4
5/8/15 10:04	531.2	44.7	201.9	91.8	87.4	704.5	2919.8	11.7
5/8/15 10:05	528.7	44.9	205.5	91.8	87.6	704.4	2905.6	11.6
5/8/15 10:06	517.8	46.2	206.3	91.8	87.1	704.3	2905.9	11.5
5/8/15 10:07	520.1	45.3	204.7	91.8	87.3	704.3	2909.1	10.8
5/8/15 10:08	510.4	45.7	200.6	91.8	87.2	704.2	2903.9	10.5
5/8/15 10:09	498.2	44.7	201.4	91.8	87.0	704.1	2891.4	11.1
5/8/15 10:10	506.9	44.2	205.5	91.8	85.7	704.1	2900.6	11.7
5/8/15 10:11	512.3	42.6	201.7	91.8	85.6	704.0	2908.0	11.5
5/8/15 10:12	500.6	43.4	203.8	91.8	85.9	703.9	2897.3	11.5
5/8/15 10:13	513.0	44.3	206.8	91.8	85.8	703.9	2914.0	11.4
5/8/15 10:14	529.0	43.8	203.9	91.8	85.8	703.8	2898.8	10.9
5/8/15 10:15	532.5	44.2	200.4	91.8	86.4	703.7	2897.2	10.1
5/8/15 10:16	518.4	44.8	204.4	91.8	87.4	703.9	2912.1	10.6
5/8/15 10:17	515.1	45.7	204.7	91.8	87.3	704.4	2915.4	10.9
5/8/15 10:18	517.7	44.9	206.2	91.8	87.6	704.8	2917.2	11.3
5/8/15 10:19	512.9	43.6	203.8	91.8	87.4	705.3	2927.4	11.2
5/8/15 10:20	529.2	44.3	204.0	91.8	87.2	705.7	2911.9	10.6
5/8/15 10:21	522.4	44.2	200.1	91.8	87.2	706.2	2905.7	10.1
5/8/15 10:22	510.2	45.4	203.7	91.8	87.4	706.7	2905.7	9.8
5/8/15 10:23	509.7	43.5	202.1	91.8	86.2	707.1	2898.2	9.9
5/8/15 10:24	524.3	42.8	203.4	91.8	86.7	707.6	2905.5	10.9
5/8/15 10:25	519.3	43.3	200.1	91.8	86.8	708.1	2900.0	11.2
5/8/15 10:26	513.9	43.7	207.1	91.8	86.7	708.5	2901.7	11.4
5/8/15 10:27	504.5	43.6	203.8	91.8	86.6	709.0	2899.8	11.0
5/8/15 10:28	507.3	44.5	201.1	91.8	86.5	709.4	2904.8	10.6
5/8/15 10:29	519.8	43.8	203.3	91.8	86.5	709.9	2907.9	10.2
5/8/15 10:30	530.9	43.7	207.1	91.8	86.9	710.4	2902.4	9.9
5/8/15 10:31	529.8	45.5	204.2	91.8	87.4	710.8	2907.8	10.3
5/8/15 10:32	525.5	45.4	205.9	91.8	87.7	711.3	2899.0	11.0
5/8/15 10:33	523.4	45.8	205.7	91.8	87.5	711.7	2913.4	11.5
5/8/15 10:34	517.6	45.1	205.3	91.8	87.4	712.2	2903.3	11.4

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 10:35	522.2	44.2	205.5	91.8	87.4	712.7	2903.6	10.9
5/8/15 10:36	518.9	44.2	203.6	91.8	87.1	713.1	2901.5	10.3
5/8/15 10:37	501.3	45.7	207.4	91.8	87.2	713.6	2912.9	10.1
5/8/15 10:38	505.2	44.7	200.3	91.8	86.0	714.0	2906.1	10.4
5/8/15 10:39	517.3	44.1	207.8	91.8	86.0	714.5	2919.6	11.3
5/8/15 10:40	514.8	45.0	203.3	91.8	86.5	715.0	2920.5	11.7
5/8/15 10:41	511.3	45.4	206.2	91.8	85.8	715.2	2907.8	11.2
5/8/15 10:42	521.8	45.0	206.5	91.8	86.6	715.1	2897.2	11.2
5/8/15 10:43	519.9	44.1	201.6	91.8	86.9	715.1	2909.7	10.8
5/8/15 10:44	518.8	44.3	203.2	91.8	87.1	715.0	2901.8	10.1
5/8/15 10:45	517.8	42.6	196.8	91.8	86.9	715.0	2893.0	10.4
5/8/15 10:46	521.1	43.6	199.2	91.8	86.7	714.9	2905.1	10.5
5/8/15 10:47	525.1	44.3	197.6	91.8	87.5	714.9	2892.4	11.1
5/8/15 10:48	511.8	45.3	211.2	91.8	87.2	714.8	2897.6	11.4
5/8/15 10:49	512.6	46.0	204.8	91.8	87.2	714.8	2897.3	11.1
5/8/15 10:50	518.1	43.3	202.1	91.8	86.7	714.7	2900.9	10.6
5/8/15 10:51	524.8	44.1	201.6	91.8	86.7	714.7	2888.7	9.8
5/8/15 10:52	507.7	44.3	204.1	91.8	87.0	714.7	2898.7	9.9
5/8/15 10:53	506.4	46.2	199.1	91.8	86.7	714.6	2883.7	10.9
5/8/15 10:54	512.9	44.4	206.5	91.8	86.4	714.6	2894.1	11.4
5/8/15 10:55	506.3	43.3	200.5	91.8	86.3	714.5	2894.2	11.4
5/8/15 10:56	519.2	43.7	207.3	91.8	86.6	714.5	2889.2	11.1
5/8/15 10:57	505.7	45.0	206.5	91.8	86.9	714.4	2889.0	10.6
5/8/15 10:58	511.4	45.2	205.3	91.8	86.1	714.4	2891.0	9.8
5/8/15 10:59	523.8	44.0	206.3	91.8	86.5	714.3	2886.4	9.9
5/8/15 11:00	523.4	44.6	200.6	91.8	86.7	714.3	2899.7	9.9
5/8/15 11:01	530.6	45.1	200.8	91.8	86.9	714.2	2884.2	10.7
5/8/15 11:02	524.0	46.1	203.0	91.8	87.3	714.2	2902.5	11.2
5/8/15 11:03	527.7	46.7	200.6	91.8	87.4	714.1	2893.1	11.3
5/8/15 11:04	526.2	46.8	206.8	91.8	87.1	714.1	2906.1	11.1
5/8/15 11:05	521.7	45.8	203.1	91.8	87.4	714.0	2903.6	10.5
5/8/15 11:06	518.9	45.9	205.2	91.8	87.5	714.0	2893.7	9.9
5/8/15 11:07	510.5	46.1	204.6	91.8	87.2	713.9	2894.6	10.3
5/8/15 11:08	509.8	45.7	202.9	91.8	87.3	713.9	2895.3	11.1
5/8/15 11:09	535.0	43.8	203.5	91.8	86.8	713.8	2891.9	11.6
5/8/15 11:10	531.7	44.2	200.4	91.8	87.6	713.8	2893.4	11.4
5/8/15 11:11	513.1	47.1	205.1	91.8	87.5	713.7	2882.9	11.4
5/8/15 11:12	509.1	46.8	207.5	91.8	87.3	713.7	2891.5	10.7
5/8/15 11:13	502.1	45.2	202.5	91.8	86.7	713.6	2888.0	10.3
5/8/15 11:14	514.1	45.6	206.4	91.7	86.8	713.6	2898.3	10.2
5/8/15 11:15	521.5	45.1	205.6	91.7	86.8	713.5	2898.7	10.6
5/8/15 11:16	513.9	44.5	200.8	91.7	86.9	713.5	2892.9	11.2
5/8/15 11:17	506.7	46.3	200.4	91.7	86.7	713.4	2887.9	11.4
5/8/15 11:18	512.7	45.4	200.8	91.7	85.9	713.4	2888.7	11.4
5/8/15 11:19	510.5	44.6	207.3	91.6	85.7	713.3	2882.5	11.4
5/8/15 11:20	514.0	45.6	204.7	91.6	85.9	713.3	2880.6	10.3
5/8/15 11:21	513.9	44.8	203.4	91.6	86.2	713.3	2878.6	10.1
5/8/15 11:22	516.4	44.6	207.3	91.6	86.5	713.2	2869.4	10.8
5/8/15 11:23	516.7	44.6	196.3	91.6	86.3	713.2	2886.4	11.3
5/8/15 11:24	514.7	45.8	205.2	91.6	86.2	713.1	2885.1	11.4
5/8/15 11:25	503.3	44.6	205.5	91.5	86.0	713.1	2876.2	11.1
5/8/15 11:26	495.0	44.4	203.5	91.5	85.3	713.0	2878.1	10.3
5/8/15 11:27	510.9	44.1	200.3	91.5	85.1	713.0	2881.6	9.2
5/8/15 11:28	518.3	43.8	200.9	91.5	85.6	712.9	2892.3	9.3
5/8/15 11:29	511.1	45.3	203.9	91.5	86.0	712.9	2891.5	9.7

Line 4 Waste Gas Stack (SV118) Process Data

	AL601152	AI604048	AI617Q03	AC604017	AI604024	AD600035	AI617012	AI617000
Timestamp	030-04-0 TOTAL TONS TO 031	037-04-1 REJECT TONS	000-04-0 WOOD FLOW	252-04-1 KILN BURNER LINE GAS	242-04-1 PH BURNER GAS FLOW	LINE 4 MBTUS PER TON	247-04-1 Scrubber Flow	247-04-1 Scrubber dP
5/8/15 11:30	518.2	46.2	206.1	91.4	85.9	712.8	2878.1	10.3
5/8/15 11:31	520.1	45.5	207.8	91.4	86.5	712.8	2890.7	10.9
5/8/15 11:32	517.4	46.6	205.8	91.4	87.1	712.7	2877.9	10.9
5/8/15 11:33	530.6	47.3	207.1	91.4	87.0	712.7	2885.3	10.8
5/8/15 11:34	523.2	46.8	207.6	91.4	87.3	712.6	2887.6	9.9
5/8/15 11:35	523.5	46.8	204.0	91.4	87.3	712.6	2884.4	9.6
5/8/15 11:36	520.0	47.4	201.9	91.4	87.1	712.5	2872.0	9.8
5/8/15 11:37	512.9	46.9	201.5	91.5	87.6	712.5	2875.8	10.3
5/8/15 11:38	516.2	46.6	207.0	91.6	87.0	712.4	2881.3	11.1
5/8/15 11:39	510.8	45.2	205.2	91.6	87.1	712.4	2890.5	11.1
5/8/15 11:40	525.3	47.0	201.8	91.7	86.5	712.3	2881.8	10.7
5/8/15 11:41	526.3	46.2	201.0	91.7	86.5	712.3	2883.3	10.4
5/8/15 11:42	511.0	46.0	200.5	91.7	87.0	712.2	2888.1	10.1
5/8/15 11:43	513.2	46.1	197.0	91.7	86.8	712.2	2911.1	10.3
5/8/15 11:44	527.0	45.7	202.1	91.7	86.9	712.1	2909.3	10.5
5/8/15 11:45	518.5	46.5	201.2	91.7	86.9	712.1	2915.9	11.2
5/8/15 11:46	520.1	46.5	204.0	91.7	87.2	712.0	2911.1	11.5
5/8/15 11:47	514.2	45.6	212.0	91.7	87.4	712.0	2920.2	11.4
5/8/15 11:48	524.5	46.5	205.3	91.7	87.3	712.0	2915.2	11.3
5/8/15 11:49	523.2	46.8	206.0	91.7	86.8	711.9	2923.6	10.8
5/8/15 11:50	520.4	45.9	207.3	91.7	87.0	711.9	2899.6	10.2
5/8/15 11:51	503.2	45.8	200.0	91.7	87.4	711.8	2918.3	10.7
5/8/15 11:52	512.8	45.6	203.9	91.7	86.6	711.8	2913.9	11.2
5/8/15 11:53	515.4	44.9	204.2	91.7	87.0	711.7	2908.4	11.4
5/8/15 11:54	518.4	45.6	202.0	91.7	87.0	711.7	2923.2	11.1
5/8/15 11:55	517.8	45.3	201.4	91.7	86.6	711.6	2911.4	11.2
5/8/15 11:56	519.2	45.9	200.8	91.7	86.7	711.6	2908.4	10.3
5/8/15 11:57	526.6	46.6	202.1	91.7	86.8	711.5	2919.8	9.8
5/8/15 11:58	527.6	46.0	200.0	91.6	86.9	711.5	2891.2	10.0
5/8/15 11:59	516.3	46.8	201.3	91.6	87.2	711.4	2885.6	10.3
5/8/15 12:00	521.0	46.6	202.6	91.6	87.2	711.4	2901.6	10.9
5/8/15 12:01	506.4	44.8	200.6	91.6	86.8	711.3	2897.3	11.2
5/8/15 12:02	523.6	44.7	208.0	91.6	86.3	711.3	2903.6	10.9
5/8/15 12:03	510.1	43.8	204.6	91.6	87.3	711.2	2901.9	10.5
5/8/15 12:04	519.9	46.0	207.9	91.6	86.6	711.2	2898.0	9.9
5/8/15 12:05	509.5	44.7	208.0	91.6	87.0	711.1	2891.3	9.9
5/8/15 12:06	521.6	46.1	201.2	91.6	86.1	711.1	2898.3	10.7
5/8/15 12:07	517.3	45.4	204.8	91.6	86.4	711.0	2909.5	11.2
5/8/15 12:08	503.7	46.3	207.2	91.6	86.5	711.0	2894.7	11.4
5/8/15 12:09	510.0	45.8	205.8	91.6	86.0	710.9	2893.4	11.0
5/8/15 12:10	518.7	43.6	201.6	91.6	85.4	710.9	2892.8	10.3
5/8/15 12:11	526.8	43.7	204.0	91.6	86.7	710.8	2893.9	9.5
5/8/15 12:12	512.6	45.0	204.0	91.6	87.2	710.8	2896.7	9.4
5/8/15 12:13	510.6	46.4	196.1	91.6	87.0	710.7	2894.0	10.2
5/8/15 12:14	518.0	45.1	203.2	91.6	86.7	710.7	2893.6	10.8
5/8/15 12:15	525.4	45.3	205.4	91.6	86.8	710.6	2888.3	10.9
5/8/15 12:16	519.7	45.3	206.0	91.5	87.2	710.6	2898.7	11.0
5/8/15 12:17	517.4	45.3	208.1	91.5	86.9	710.6	2887.1	10.9
5/8/15 12:18	510.7	45.9	215.0	91.5	87.1	710.5	2893.3	10.5
5/8/15 12:19	528.4	45.2	207.4	91.5	86.9	710.5	2897.5	9.8
5/8/15 12:20	520.4	45.3	205.4	91.5	87.0	710.4	2885.0	10.5
5/8/15 12:21	510.3	47.3	204.3	91.5	87.2	710.4	2889.7	11.3
5/8/15 12:22	519.7	46.7	207.9	91.5	87.2	710.3	2893.0	11.7
5/8/15 12:23	520.6	46.3	204.3	91.5	87.3	710.3	2872.6	11.3
5/8/15 12:24	523.0	47.4	207.9	91.5	87.3	710.2	2905.2	11.1

Line 4 Waste Gas Stack (SV118) Process Data

	AL601152	AI604048	AI617Q03	AC604017	AI604024	AD600035	AI617012	AI617000
Timestamp	030-04-0 TOTAL TONS TO 031	037-04-1 REJECT TONS	000-04-0 WOOD FLOW	252-04-1 KILN BURNER LINE GAS	242-04-1 PH BURNER GAS FLOW	LINE 4 MBTUS PER TON	247-04-1 Scrubber Flow	247-04-1 Scrubber dP
5/8/15 12:25	513.7	46.1	207.7	91.5	87.0	710.2	2903.4	10.8
5/8/15 12:26	503.2	46.3	207.9	91.5	86.7	710.1	2896.4	10.0
5/8/15 12:27	513.5	46.4	203.7	91.5	86.4	710.1	2897.1	10.2
5/8/15 12:28	508.7	44.7	202.0	91.5	86.3	710.0	2903.1	10.3
5/8/15 12:29	511.7	45.5	203.1	91.5	86.0	710.0	2904.2	10.7
5/8/15 12:30	517.3	45.9	196.4	91.5	85.9	709.9	2905.8	11.4
5/8/15 12:31	515.3	46.5	202.8	91.5	85.8	709.9	2889.2	11.4
5/8/15 12:32	505.0	47.0	203.6	91.5	85.9	709.8	2895.5	11.3
5/8/15 12:33	504.0	46.7	205.2	91.5	85.3	709.8	2890.4	10.5
5/8/15 12:34	511.4	46.5	206.8	91.4	85.1	709.7	2894.5	10.2
5/8/15 12:35	519.9	45.9	201.7	91.4	85.9	709.7	2891.3	10.9
5/8/15 12:36	531.0	46.7	204.1	91.4	86.2	709.6	2893.2	11.2
5/8/15 12:37	522.0	47.8	206.5	91.4	87.1	709.6	2900.1	11.5
5/8/15 12:38	511.3	48.7	202.5	91.4	87.0	709.8	2906.9	11.4
5/8/15 12:39	523.3	47.8	200.3	91.4	87.0	710.0	2904.8	11.0
5/8/15 12:40	515.8	47.9	205.7	91.4	87.5	710.2	2917.5	9.7
5/8/15 12:41	508.5	47.0	204.1	91.4	87.0	710.5	2901.6	9.5
5/8/15 12:42	518.3	45.5	201.5	91.4	87.0	710.7	2910.7	9.6
5/8/15 12:43	513.6	46.1	204.4	91.4	87.2	710.9	2902.1	10.0
5/8/15 12:44	520.4	46.6	203.7	91.4	87.1	711.1	2909.5	11.0
5/8/15 12:45	507.5	45.5	200.7	91.4	87.1	711.3	2902.6	11.2
5/8/15 12:46	512.5	45.6	201.7	91.4	86.3	711.6	2914.7	11.1
5/8/15 12:47	510.9	45.6	202.3	91.4	86.0	711.8	2900.9	10.4
5/8/15 12:48	502.6	45.3	202.8	91.4	85.3	712.0	2896.4	9.9
5/8/15 12:49	518.5	45.5	207.1	91.4	85.3	712.2	2895.3	9.9
5/8/15 12:50	508.3	45.0	207.6	91.4	85.3	712.4	2905.3	11.0
5/8/15 12:51	512.3	45.2	207.5	91.4	85.6	712.6	2903.2	11.2
5/8/15 12:52	525.1	44.5	206.5	91.3	86.6	712.9	2893.3	11.4
5/8/15 12:53	515.7	45.6	205.1	91.3	86.7	713.1	2899.2	10.9
5/8/15 12:54	523.8	44.8	204.4	91.3	86.8	713.3	2894.2	10.0
5/8/15 12:55	520.8	44.6	203.6	91.3	86.7	713.5	2889.9	9.4
5/8/15 12:56	522.3	45.9	201.2	91.3	86.7	713.7	2893.7	9.3
5/8/15 12:57	514.0	46.2	200.1	91.3	86.2	713.8	2896.8	9.9
5/8/15 12:58	520.2	46.2	203.9	91.3	86.3	713.8	2911.2	10.4
5/8/15 12:59	526.7	46.1	201.2	91.3	86.3	713.7	2910.5	11.1
5/8/15 13:00	511.3	46.4	205.4	91.3	86.4	713.7	2897.3	11.0
5/8/15 13:01	525.9	46.7	201.8	91.3	86.5	713.6	2906.9	10.6
5/8/15 13:02	522.4	46.9	200.1	91.3	87.3	713.6	2905.2	10.1
5/8/15 13:03	525.8	47.3	202.2	91.3	87.2	713.5	2909.8	10.1
5/8/15 13:04	519.6	46.6	204.0	91.3	87.1	713.5	2907.1	10.4
5/8/15 13:05	511.0	46.8	202.7	91.3	86.9	713.4	2903.9	11.0
5/8/15 13:06	513.7	46.6	204.0	91.3	86.7	713.4	2900.9	11.2
5/8/15 13:07	512.3	44.9	204.0	91.3	86.2	713.4	2911.8	10.9
5/8/15 13:08	514.9	45.5	204.0	91.3	86.1	713.3	2915.4	10.6
5/8/15 13:09	519.2	46.1	208.0	91.3	86.0	713.3	2910.9	9.8
5/8/15 13:10	505.5	46.2	207.3	91.2	86.9	713.2	2907.0	9.7
5/8/15 13:11	503.5	47.9	205.3	91.2	86.1	713.2	2912.6	10.2
5/8/15 13:12	518.7	46.9	206.0	91.2	85.5	713.1	2908.9	10.6
5/8/15 13:13	514.1	46.0	208.0	91.2	85.3	713.1	2927.8	11.3
5/8/15 13:14	507.6	47.7	201.3	91.2	85.6	713.0	2886.7	11.5
5/8/15 13:15	517.4	48.2	200.0	91.2	86.3	713.0	2900.4	11.4
5/8/15 13:16	511.8	47.3	205.3	91.2	86.0	713.5	2902.8	11.0
5/8/15 13:17	508.0	48.1	203.0	91.2	85.9	714.0	2896.2	10.6
5/8/15 13:18	512.8	47.4	207.9	91.2	85.7	714.6	2896.9	10.5
5/8/15 13:19	521.1	47.5	207.1	91.2	86.0	715.1	2893.4	11.1

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 13:20	524.0	47.0	202.1	91.2	86.5	715.7	2895.9	11.5
5/8/15 13:21	541.1	47.8	203.9	91.2	86.9	716.2	2882.7	11.6
5/8/15 13:22	515.8	48.3	201.4	91.2	86.9	716.7	2898.0	11.5
5/8/15 13:23	512.9	48.9	204.0	91.2	87.3	717.3	2901.4	11.3
5/8/15 13:24	525.2	47.8	206.0	91.2	86.8	717.8	2878.5	10.2
5/8/15 13:25	524.3	47.6	204.1	91.2	87.1	718.4	2907.5	9.6
5/8/15 13:26	506.7	48.3	205.2	91.2	87.2	718.9	2902.0	10.1
5/8/15 13:27	513.9	47.9	205.3	91.2	87.0	719.4	2900.0	10.8
5/8/15 13:28	532.9	46.3	205.4	91.1	86.7	720.0	2900.4	11.3
5/8/15 13:29	524.4	47.0	204.8	91.1	87.0	720.5	2903.1	11.5
5/8/15 13:30	513.7	48.1	202.4	91.1	87.0	721.1	2894.5	11.4
5/8/15 13:31	518.7	46.5	200.2	91.1	87.1	721.6	2905.1	11.0
5/8/15 13:32	508.7	45.1	204.0	91.1	86.9	722.1	2900.6	10.3
5/8/15 13:33	502.2	46.8	204.0	91.1	86.2	722.7	2904.6	10.4
5/8/15 13:34	511.4	45.8	202.1	91.1	86.1	723.1	2904.4	11.3
5/8/15 13:35	500.3	45.4	204.2	91.1	85.3	722.1	2900.3	11.5
5/8/15 13:36	510.8	46.2	202.0	91.1	84.9	721.0	2903.1	11.3
5/8/15 13:37	511.0	45.4	204.0	91.1	84.9	719.9	2908.7	11.4
5/8/15 13:38	518.8	46.1	204.0	91.1	84.9	718.8	2900.6	10.5
5/8/15 13:39	514.2	47.2	202.0	91.1	85.3	717.7	2908.7	10.1
5/8/15 13:40	515.3	47.8	202.0	91.1	85.4	716.7	2907.7	9.9
5/8/15 13:41	522.5	47.9	197.5	91.1	85.9	715.6	2904.2	10.5
5/8/15 13:42	523.1	47.3	198.4	91.1	86.7	714.5	2903.4	11.0
5/8/15 13:43	520.6	47.1	203.1	91.1	86.8	713.4	2907.5	11.3
5/8/15 13:44	529.6	47.4	199.2	91.1	86.7	712.3	2900.4	11.3
5/8/15 13:45	530.5	47.5	198.3	91.1	87.0	711.3	2886.7	10.9
5/8/15 13:46	521.2	48.1	202.5	91.0	87.0	710.2	2890.0	9.7
5/8/15 13:47	512.3	48.4	202.7	91.0	86.8	709.1	2884.2	10.0
5/8/15 13:48	525.2	47.7	203.0	91.0	86.8	708.0	2938.0	10.5
5/8/15 13:49	518.5	46.2	201.3	91.0	86.9	706.9	2907.9	10.9
5/8/15 13:50	504.7	45.6	201.3	91.0	87.0	710.6	2912.6	11.4
5/8/15 13:51	501.3	45.2	207.3	91.0	85.6	714.5	2911.5	11.5
5/8/15 13:52	512.8	44.4	202.8	91.0	85.4	718.3	2908.0	10.7
5/8/15 13:53	511.8	45.3	206.1	91.0	86.0	720.1	2920.0	9.9
5/8/15 13:54	517.8	46.4	200.7	91.0	85.8	719.7	2904.4	9.6
5/8/15 13:55	525.7	47.1	206.4	91.0	85.9	719.3	2902.8	10.4
5/8/15 13:56	510.0	47.4	207.6	90.9	86.3	718.9	2897.4	10.9
5/8/15 13:57	526.5	47.7	207.9	90.9	86.4	718.5	2905.5	11.3
5/8/15 13:58	515.6	45.3	203.1	90.9	86.8	718.0	2904.6	11.2
5/8/15 13:59	513.6	46.9	205.1	90.9	86.8	717.6	2902.7	11.1
5/8/15 14:00	520.9	46.4	205.8	90.9	86.6	717.2	2899.7	10.8
5/8/15 14:01	523.8	47.1	203.9	90.9	86.7	716.8	2914.9	9.8
5/8/15 14:02	515.5	47.5	206.4	90.9	87.0	716.4	2887.3	10.2
5/8/15 14:03	517.9	46.6	205.0	90.8	86.9	716.0	2898.9	10.9
5/8/15 14:04	510.1	46.8	207.9	90.8	87.2	715.6	2911.8	11.1
5/8/15 14:05	518.4	46.3	204.4	90.8	86.5	715.2	2896.5	11.3
5/8/15 14:06	526.0	46.3	207.5	90.8	86.7	714.7	2894.3	11.4
5/8/15 14:07	518.7	46.7	206.5	90.8	86.8	714.3	2896.9	10.4
5/8/15 14:08	521.4	45.9	204.1	90.8	87.1	713.9	2896.7	9.7
5/8/15 14:09	521.7	45.8	206.8	90.8	86.7	713.5	2885.7	9.9
5/8/15 14:10	516.8	46.3	211.8	90.7	86.9	713.1	2894.9	10.0
5/8/15 14:11	511.4	45.5	206.9	91.1	86.7	712.7	2888.7	10.7
5/8/15 14:12	516.4	45.8	202.5	91.4	86.8	712.3	2913.3	11.0
5/8/15 14:13	509.3	44.6	200.1	91.0	86.5	711.8	2874.9	11.2
5/8/15 14:14	510.3	45.2	204.1	90.9	85.9	711.4	2921.9	11.0

Line 4 Waste Gas Stack (SV118) Process Data

	AL601152	AI604048	AI617Q03	AC604017	AI604024	AD600035	AI617012	AI617000
Timestamp	030-04-0 TOTAL TONS TO 031	037-04-1 REJECT TONS	000-04-0 WOOD FLOW	252-04-1 KILN BURNER LINE GAS	242-04-1 PH BURNER GAS FLOW	LINE 4 MBTUS PER TON	247-04-1 Scrubber Flow	247-04-1 Scrubber dP
5/8/15 14:15	507.5	44.7	202.1	90.9	85.1	711.0	2868.7	10.5
5/8/15 14:16	514.5	44.5	203.9	90.9	85.8	710.6	2925.7	10.0
5/8/15 14:17	520.9	44.4	204.1	91.0	85.7	710.2	2869.7	10.5
5/8/15 14:18	536.9	46.1	200.0	91.0	86.8	709.8	2941.0	11.3
5/8/15 14:19	530.2	46.5	204.0	91.0	87.1	709.4	2853.3	11.9
5/8/15 14:20	523.2	47.8	200.0	91.0	87.0	708.9	2914.3	11.6
5/8/15 14:21	519.8	46.7	208.0	91.1	86.8	708.5	2828.7	11.3
5/8/15 14:22	520.2	46.8	204.0	91.1	86.9	708.1	2859.3	10.5
5/8/15 14:23	517.5	46.1	200.7	91.1	87.1	709.3	2910.4	9.8
5/8/15 14:24	513.3	46.5	200.0	91.1	87.1	710.5	2915.7	9.9
5/8/15 14:25	516.7	46.8	198.0	91.2	86.9	711.8	2902.1	10.5
5/8/15 14:26	526.0	46.8	205.1	91.2	86.6	713.0	2914.2	11.3
5/8/15 14:27	517.7	46.4	202.7	91.2	86.9	714.3	2921.7	11.7
5/8/15 14:28	507.4	47.0	204.1	91.2	86.7	715.5	2899.3	11.3
5/8/15 14:29	514.1	46.4	202.1	91.3	86.3	716.7	2888.2	11.1
5/8/15 14:30	505.1	46.1	205.9	91.3	86.3	718.0	2901.9	10.3
5/8/15 14:31	514.2	46.6	208.2	91.3	85.4	719.2	2885.3	10.0
5/8/15 14:32	512.6	45.4	207.8	91.3	85.4	720.4	2891.3	11.1
5/8/15 14:33	534.7	46.2	200.1	91.4	86.7	720.6	2888.4	11.1
5/8/15 14:34	526.7	48.8	200.1	91.4	87.0	719.9	2891.1	11.3
5/8/15 14:35	509.2	48.1	200.1	91.4	87.1	719.2	2894.6	11.2
5/8/15 14:36	523.9	47.8	207.9	91.4	87.0	718.6	2901.9	10.4
5/8/15 14:37	525.5	47.0	207.5	91.4	86.8	717.9	2892.4	9.7
5/8/15 14:38	517.7	48.2	202.5	91.4	87.1	717.2	2891.8	9.6
5/8/15 14:39	520.8	47.6	206.6	91.4	87.1	716.5	2890.3	10.0
5/8/15 14:40	515.4	46.9	200.1	91.5	86.9	715.8	2882.1	10.4
5/8/15 14:41	502.3	47.7	203.4	91.5	86.1	715.7	2895.6	11.0
5/8/15 14:42	508.3	46.2	199.3	91.5	85.9	715.6	2891.4	11.1
5/8/15 14:43	519.2	46.7	203.6	91.5	86.0	715.5	2894.8	11.0
5/8/15 14:44	519.9	46.3	200.1	91.5	86.0	715.4	2886.4	10.4
5/8/15 14:45	517.5	47.4	208.0	91.5	86.4	715.3	2887.5	10.0
5/8/15 14:46	514.9	47.3	201.2	91.5	86.2	715.2	2904.2	10.4
5/8/15 14:47	509.2	47.3	204.4	91.5	86.8	715.1	2890.7	11.0
5/8/15 14:48	522.4	48.7	202.2	91.5	86.5	715.0	2898.0	11.2
5/8/15 14:49	522.6	47.3	206.6	91.5	86.6	714.9	2903.7	11.4
5/8/15 14:50	522.1	47.1	200.9	91.5	86.6	714.8	2889.8	10.6
5/8/15 14:51	518.0	48.4	203.7	91.5	87.1	714.7	2893.9	9.7
5/8/15 14:52	514.6	48.2	200.3	91.5	86.8	714.6	2897.4	9.6
5/8/15 14:53	512.7	47.2	199.9	91.5	86.7	714.5	2886.0	9.8
5/8/15 14:54	521.6	47.2	204.8	91.5	86.6	714.4	2891.0	9.7
5/8/15 14:55	511.5	46.8	207.8	91.5	86.9	714.3	2884.3	10.4
5/8/15 14:56	510.0	47.6	205.1	91.5	85.6	714.2	2887.3	10.8
5/8/15 14:57	510.2	46.3	201.4	91.5	85.3	714.1	2891.2	10.9
5/8/15 14:58	510.5	46.5	204.1	91.5	85.8	714.0	2879.4	10.7
5/8/15 14:59	515.0	46.8	202.0	91.5	85.8	713.9	2889.1	10.0
5/8/15 15:00	506.5	46.7	200.1	91.5	85.4	713.8	2887.3	9.9
5/8/15 15:01	515.1	46.2	205.8	91.5	85.0	713.7	2893.2	10.6
5/8/15 15:02	523.7	46.9	202.6	91.5	85.9	713.6	2882.7	11.2
5/8/15 15:03	517.8	47.4	208.0	91.5	86.5	713.5	2876.0	11.4
5/8/15 15:04	519.4	46.9	200.0	91.5	82.7	713.4	2870.9	11.3
5/8/15 15:05	523.0	46.0	202.3	91.5	85.6	713.3	2884.5	10.8
5/8/15 15:06	524.6	47.6	200.0	91.5	86.6	713.2	2896.3	9.5
5/8/15 15:07	528.6	47.2	208.0	91.5	87.0	713.1	2909.1	9.5
5/8/15 15:08	518.8	47.4	208.0	91.5	86.6	713.0	2907.8	9.6
5/8/15 15:09	517.2	47.4	202.0	91.5	86.5	712.9	2900.8	10.3

Line 4 Waste Gas Stack (SV118) Process Data

Timestamp	AL601152 030-04-0 TOTAL TONS TO 031	AI604048 037-04-1 REJECT TONS	AI617Q03 000-04-0 WOOD FLOW	AC604017 252-04-1 KILN BURNER LINE GAS	AI604024 242-04-1 PH BURNER GAS FLOW	AD600035 LINE 4 MBTUS PER TON	AI617012 247-04-1 Scrubber Flow	AI617000 247-04-1 Scrubber dP
5/8/15 15:10	525.6	46.5	202.0	91.5	86.8	712.8	2912.5	10.8
5/8/15 15:11	534.7	47.1	196.1	91.5	87.1	712.7	2911.2	10.6
5/8/15 15:12	518.3	47.5	208.1	91.5	86.8	712.6	2889.4	11.0
5/8/15 15:13	519.2	47.0	208.0	91.5	86.7	712.5	2894.0	10.9
5/8/15 15:14	519.9	46.3	201.3	91.5	86.7	712.4	2899.7	10.5
5/8/15 15:15	517.6	46.2	204.6	91.5	86.8	712.3	2883.2	10.4
5/8/15 15:16	501.5	45.4	205.3	91.5	86.5	712.2	2895.6	11.2
5/8/15 15:17	507.8	45.4	208.1	91.5	84.4	712.3	2908.6	11.8
5/8/15 15:18	521.2	43.9	199.4	91.5	85.0	712.4	2893.6	11.4
5/8/15 15:19	524.8	44.8	207.9	91.5	86.1	712.5	2898.2	11.4
5/8/15 15:20	528.1	46.1	200.7	91.5	86.9	712.5	2898.6	11.3
5/8/15 15:21	519.1	45.8	198.9	91.5	86.7	712.6	2908.8	10.8
5/8/15 15:22	520.7	45.4	204.2	91.6	87.0	712.7	2902.0	10.7
5/8/15 15:23	514.7	45.3	201.8	91.6	86.5	712.7	2901.5	10.9
5/8/15 15:24	503.0	44.8	200.3	91.6	86.5	712.8	2898.3	11.0
5/8/15 15:25	515.8	44.1	197.8	91.6	85.8	712.9	2897.0	11.3
5/8/15 15:26	525.8	44.2	207.1	91.6	86.4	713.0	2896.6	11.3
5/8/15 15:27	520.6	44.9	206.1	91.5	86.7	713.0	2893.6	11.3
5/8/15 15:28	513.3	44.8	203.9	91.5	86.8	713.1	2892.0	10.9
5/8/15 15:29	522.4	44.2	203.7	91.5	86.6	713.2	2905.5	10.2
5/8/15 15:30	517.3	43.9	201.7	91.5	86.6	713.2	2892.2	10.5
5/8/15 15:31	518.3	44.0	202.0	91.5	86.8	713.3	2894.9	11.2
5/8/15 15:32	522.2	45.2	202.3	91.5	86.6	713.4	2899.8	11.6
5/8/15 15:33	513.0	44.9	201.6	91.5	86.8	713.5	2885.7	11.3
5/8/15 15:34	513.0	44.7	207.9	91.5	86.5	713.5	2895.1	11.0
5/8/15 15:35	521.4	44.7	200.9	91.5	85.8	713.6	2901.4	10.5
5/8/15 15:36	507.2	43.9	200.7	91.4	85.8	713.7	2891.7	9.8
5/8/15 15:37	512.2	44.6	200.0	91.4	84.4	713.8	2892.5	9.9
5/8/15 15:38	511.0	43.6	204.0	91.4	83.6	713.8	2899.2	10.5
5/8/15 15:39	516.8	44.1	203.0	91.4	85.2	713.9	2895.8	11.0
5/8/15 15:40	508.8	44.7	200.0	91.4	85.1	714.0	2898.9	11.3

Air Performance Test Form

Operating Data Summary for Process Sources

Facility Information (please print)

Company Name: U. S. Steel Corporation

Equipment ID No: SV144

Test date(s): 05/21/15

Equipment and Operating Data

- Process Equipment Description: Line 6 Waste Gas Stack
- Were the process and control equipment operated consistent with normal procedures? ☒ Yes ☐ No If no, explain: _____
- 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.
- Date(s) and procedure(s) of last maintenance/cleaning within 6 months:
☒ Remains unchanged from info. provided in test plan
- 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	Run 4	Average
Greenball Feed Rate, LTPH	520	519	516		518
Fired Pellet Production, LTPH	389	394	386		390
Fuel Input (list units) Gas, MBTUH	203.4	192.5	197.9		197.9
Heat Input (10 ⁶ British thermal units/hour)	203.4	192.5	197.9		197.9

- 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): DP (in. w.c.) and feed rate (gpm and psig)
- Baghouse, Cyclone, and Multi-clone: DP (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	Run 4	Average
Scrubber dP, in. H2O	9.1	9.4	9.2		9.2
Scrubber water flow rate, GPM	2999	2990	3000		2996.5
List pollutant & averaging basis.--should reflect permit	Run 1	Run 2	Run 3	Run 4	Average
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

5/21/15

Run	Time		Feed Rates LTPH		Prod. Rate LTPH	Gas MBTUH		Total	Scrubber Pressure	Scrubber Water
	Start	End	Green ball	To Grate		Grate	Kiln	MBTUH	inches WC	gpm
1	8:15-8:46, 10:57-12:36		520	458	389	84.2	119.2	203.4	9.1	2999
2	13:16	15:34	519	464	394	83.9	108.7	192.5	9.4	2990
3	16:13	18:26	516	455	386	83.2	114.7	197.9	9.2	3000

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 08:00:00	514.4	63.9		118.6	83.2	9.0	3007.5
21-May-15 08:01:00	515.9	62.2		120.0	83.2	9.1	3015.4
21-May-15 08:02:00	516.6	63.0		120.1	84.7	9.1	3002.2
21-May-15 08:03:00	508.3	63.4		118.0	84.7	9.0	3007.0
21-May-15 08:04:00	515.0	62.9		117.8	83.0	9.1	2980.9
21-May-15 08:05:00	508.5	63.9		119.4	82.7	8.8	2999.3
21-May-15 08:06:00	526.9	62.8		116.8	83.4	8.8	2981.6
21-May-15 08:07:00	517.9	62.9		119.1	84.6	8.8	3019.8
21-May-15 08:08:00	519.6	65.0		117.2	84.5	9.0	2997.0
21-May-15 08:09:00	516.4	65.2		117.2	84.6	9.1	2939.3
21-May-15 08:10:00	518.8	64.4		118.8	84.3	9.0	2940.9
21-May-15 08:11:00	511.7	64.0		117.3	84.1	8.8	2997.7
21-May-15 08:12:00	513.7	63.9		116.2	83.9	8.8	2954.7
21-May-15 08:13:00	511.8	65.0		118.1	82.7	8.9	2946.9
21-May-15 08:14:00	517.6	65.8		113.9	83.4	9.0	3013.8
21-May-15 08:15:00	508.8	64.7		116.9	83.1	9.0	2955.8
21-May-15 08:16:00	514.6	65.3		117.1	82.6	8.9	2948.3
21-May-15 08:17:00	521.9	67.2		115.1	83.5	8.8	3002.5
21-May-15 08:18:00	511.4	64.7		116.0	84.3	8.8	2995.8
21-May-15 08:19:00	517.1	66.2		114.9	83.3	8.8	2982.3
21-May-15 08:20:00	526.2	64.1		116.2	83.5	8.7	3004.0
21-May-15 08:21:00	517.9	64.1		113.9	84.9	8.7	3013.3
21-May-15 08:22:00	515.0	64.2		113.7	84.7	8.8	3005.5
21-May-15 08:23:00	525.1	64.0		114.2	84.6	8.8	2989.1
21-May-15 08:24:00	517.9	64.8		114.0	85.2	8.9	3015.4
21-May-15 08:25:00	520.8	65.2		114.8	85.3	9.0	2984.2
21-May-15 08:26:00	520.0	65.9		114.5	84.0	9.0	2975.5
21-May-15 08:27:00	528.4	65.2		114.0	85.6	9.0	2979.9
21-May-15 08:28:00	526.7	63.3		117.0	85.8	9.0	2992.0
21-May-15 08:29:00	522.0	64.3		114.1	85.9	9.2	2991.1
21-May-15 08:30:00	514.0	64.1		116.2	84.7	9.1	2980.8
21-May-15 08:31:00	512.2	63.9		114.8	83.9	9.2	2993.2
21-May-15 08:32:00	506.0	64.7		115.5	82.3	9.2	2997.1
21-May-15 08:33:00	513.8	63.8		116.1	81.9	9.2	3021.2
21-May-15 08:34:00	515.8	63.9		116.9	83.0	8.9	3009.4
21-May-15 08:35:00	528.5	63.2		116.7	84.2	8.8	2986.5
21-May-15 08:36:00	535.7	63.4		116.5	86.1	8.8	3006.0
21-May-15 08:37:00	529.1	63.4		117.0	86.3	8.8	2948.0
21-May-15 08:38:00	526.3	64.1		117.1	86.0	8.9	2969.4
21-May-15 08:39:00	522.0	60.8		117.2	86.1	8.9	2959.2
21-May-15 08:40:00	519.3	62.3		118.6	85.5	8.9	2967.7
21-May-15 08:41:00	505.6	60.9		118.7	84.5	8.9	2989.9
21-May-15 08:42:00	517.5	61.7		118.8	82.8	9.0	2667.1
21-May-15 08:43:00	514.9	58.4		117.1	83.6	9.3	3009.6
21-May-15 08:44:00	522.7	3.7		119.0	83.6	9.5	3023.9
21-May-15 08:45:00	531.8	0.2		119.3	85.9	8.8	3015.3
21-May-15 08:46:00	532.5	0.9		119.5	86.3	7.5	3010.9
21-May-15 08:47:00	529.3	1.8		119.2	86.4	5.9	3007.6
21-May-15 08:48:00	73.9	0.1		120.6	57.2	5.2	3012.5
21-May-15 08:49:00	3.5	0.0		125.3	2.3	4.2	3018.7
21-May-15 08:50:00	0.1	18.7		145.0	6.7	3.6	2997.3
21-May-15 08:51:00	0.0	55.9		160.2	11.0	3.7	3003.0
21-May-15 08:52:00	-0.1	0.1		175.8	15.4	5.1	2983.7
21-May-15 08:53:00	-0.1	-1.3		193.6	19.7	4.8	2991.2
21-May-15 08:54:00	110.0	-1.2		213.6	24.1	4.5	3013.6
21-May-15 08:55:00	319.2	-1.7		235.5	28.4	4.3	3000.8

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 08:56:00	324.6	-1.6	255.3	32.8	4.2	3006.7
21-May-15 08:57:00	415.7	38.5	267.3	37.1	4.8	3011.6
21-May-15 08:58:00	405.8	36.5	267.8	40.9	3.1	2995.1
21-May-15 08:59:00	390.5	42.6	258.0	44.7	2.7	3020.9
21-May-15 09:00:00	384.2	44.9	247.2	44.7	4.0	3001.9
21-May-15 09:01:00	381.1	43.8	244.0	44.7	6.0	2983.4
21-May-15 09:02:00	379.3	43.6	239.6	44.7	7.1	3001.0
21-May-15 09:03:00	381.0	42.7	234.0	44.7	8.1	2993.6
21-May-15 09:04:00	378.7	42.3	232.9	44.7	8.9	2997.3
21-May-15 09:05:00	389.7	44.4	233.7	44.6	9.6	3024.2
21-May-15 09:06:00	392.9	43.2	233.1	44.6	9.7	3022.1
21-May-15 09:07:00	387.2	43.5	232.0	44.6	9.7	3024.7
21-May-15 09:08:00	385.5	43.4	231.8	44.5	9.6	3021.6
21-May-15 09:09:00	398.6	43.2	229.0	44.4	9.6	3024.7
21-May-15 09:10:00	412.4	43.3	220.8	44.3	9.5	3033.0
21-May-15 09:11:00	415.1	46.5	215.2	44.5	9.3	3019.4
21-May-15 09:12:00	418.9	51.9	210.8	44.8	8.7	3031.4
21-May-15 09:13:00	425.7	50.8	205.3	44.7	8.3	3031.3
21-May-15 09:14:00	445.5	51.8	198.6	44.6	8.5	3042.1
21-May-15 09:15:00	460.8	50.9	191.5	44.5	8.5	3024.7
21-May-15 09:16:00	459.3	50.7	186.5	44.4	8.7	3021.2
21-May-15 09:17:00	459.3	51.6	180.2	44.3	8.9	3043.4
21-May-15 09:18:00	453.5	49.2	175.8	44.5	9.1	3027.6
21-May-15 09:19:00	429.6	51.1	171.7	44.4	9.2	3031.7
21-May-15 09:20:00	432.6	50.6	167.5	44.3	9.3	3010.7
21-May-15 09:21:00	430.0	50.2	164.9	44.7	9.4	2996.7
21-May-15 09:22:00	442.2	53.1	164.4	44.1	9.2	2982.5
21-May-15 09:23:00	455.1	53.2	163.4	44.2	8.7	2989.4
21-May-15 09:24:00	472.2	57.6	163.6	44.3	8.7	2999.1
21-May-15 09:25:00	481.3	58.4	162.6	44.4	9.3	2991.0
21-May-15 09:26:00	501.1	55.8	161.7	44.5	9.4	3000.7
21-May-15 09:27:00	507.4	56.4	160.1	44.5	9.5	3041.8
21-May-15 09:28:00	515.6	58.0	159.8	44.4	9.3	3014.3
21-May-15 09:29:00	501.1	57.6	160.7	44.4	9.4	3025.1
21-May-15 09:30:00	490.5	58.7	160.9	44.3	9.1	3023.7
21-May-15 09:31:00	475.5	56.3	160.0	44.3	8.4	3039.0
21-May-15 09:32:00	476.2	57.7	159.4	44.2	8.4	3023.0
21-May-15 09:33:00	475.5	57.8	156.9	44.3	8.8	2942.2
21-May-15 09:34:00	485.0	58.0	158.6	44.4	9.3	2954.5
21-May-15 09:35:00	494.7	61.1	159.8	44.5	9.8	3025.4
21-May-15 09:36:00	507.4	59.5	161.2	44.5	9.9	2941.9
21-May-15 09:37:00	500.7	59.6	163.4	44.5	9.8	2940.8
21-May-15 09:38:00	516.7	60.2	166.0	44.5	9.7	3034.8
21-May-15 09:39:00	512.0	61.0	171.2	44.5	9.7	3034.5
21-May-15 09:40:00	508.5	60.4	169.9	44.5	9.5	3027.6
21-May-15 09:41:00	510.6	61.2	170.5	44.5	9.5	3038.9
21-May-15 09:42:00	511.6	61.8	171.2	44.5	9.4	2948.8
21-May-15 09:43:00	520.1	63.4	170.9	44.5	9.1	2939.3
21-May-15 09:44:00	515.2	63.2	168.1	44.5	9.1	3031.7
21-May-15 09:45:00	523.8	63.7	169.4	44.5	9.3	2731.1
21-May-15 09:46:00	517.8	64.2	171.4	44.5	9.6	2938.2
21-May-15 09:47:00	520.2	64.0	170.8	44.5	9.8	3044.9
21-May-15 09:48:00	524.7	63.7	171.2	44.5	9.9	2969.3
21-May-15 09:49:00	519.2	63.1	172.1	44.5	9.8	2966.3
21-May-15 09:50:00	511.2	65.1	173.1	47.4	9.8	3042.7
21-May-15 09:51:00	508.1	64.5	172.5	54.4	9.8	3027.0

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 09:52:00	505.1	65.2		173.8	78.2	9.7	3038.1
21-May-15 09:53:00	512.1	65.0		171.8	80.0	9.7	3021.8
21-May-15 09:54:00	517.1	66.2		170.7	80.9	9.7	3050.9
21-May-15 09:55:00	519.7	66.5		167.9	81.8	9.6	3031.8
21-May-15 09:56:00	528.1	66.1		162.8	83.4	9.5	3013.2
21-May-15 09:57:00	532.0	63.9		159.4	85.0	9.5	3017.3
21-May-15 09:58:00	526.0	65.7		153.6	85.1	9.5	3021.5
21-May-15 09:59:00	522.3	65.5		150.2	85.1	9.4	3011.3
21-May-15 10:00:00	514.5	65.9		144.1	84.0	9.2	3018.7
21-May-15 10:01:00	516.0	65.4		139.6	83.2	8.9	3018.1
21-May-15 10:02:00	522.7	63.8		132.8	83.3	8.8	3026.0
21-May-15 10:03:00	520.2	65.7		129.2	83.7	8.9	3021.9
21-May-15 10:04:00	515.6	65.9		126.1	84.2	9.0	3022.1
21-May-15 10:05:00	517.3	66.2		121.0	83.5	9.3	2982.5
21-May-15 10:06:00	531.7	63.7		119.8	84.2	9.7	2984.0
21-May-15 10:07:00	522.9	62.4		116.6	84.9	9.6	2997.2
21-May-15 10:08:00	525.2	64.5		117.5	84.8	9.5	2994.8
21-May-15 10:09:00	514.2	64.6		116.9	83.9	9.4	2941.3
21-May-15 10:10:00	502.0	63.8		116.4	82.7	9.3	2924.2
21-May-15 10:11:00	504.1	65.2		116.3	80.4	9.3	2986.9
21-May-15 10:12:00	509.4	65.0		113.5	79.2	9.1	2971.5
21-May-15 10:13:00	512.6	65.3		114.8	80.1	9.0	2975.4
21-May-15 10:14:00	524.7	66.6		115.6	81.8	9.0	3029.7
21-May-15 10:15:00	536.6	66.7		113.2	84.3	9.1	2971.7
21-May-15 10:16:00	534.5	66.9		112.7	85.9	9.1	2962.4
21-May-15 10:17:00	530.1	68.3		110.9	86.4	9.2	3040.1
21-May-15 10:18:00	526.6	65.6		110.0	86.1	9.0	3034.4
21-May-15 10:19:00	531.3	64.4		109.3	85.9	8.6	3042.2
21-May-15 10:20:00	527.9	63.7		106.7	86.2	8.3	3023.6
21-May-15 10:21:00	511.9	64.0		104.0	85.4	8.3	3033.4
21-May-15 10:22:00	504.9	64.4		100.5	83.5	8.6	3028.3
21-May-15 10:23:00	503.6	64.9		99.2	81.0	8.9	3042.3
21-May-15 10:24:00	500.3	65.1		98.9	78.8	9.3	3035.2
21-May-15 10:25:00	492.6	67.6		99.2	76.9	9.5	3040.5
21-May-15 10:26:00	503.3	67.1		99.4	76.1	9.4	3026.2
21-May-15 10:27:00	511.9	68.8		102.1	78.1	9.4	3017.6
21-May-15 10:28:00	522.2	68.7		102.4	80.3	9.3	3027.2
21-May-15 10:29:00	524.5	69.0		102.3	84.0	9.2	3017.4
21-May-15 10:30:00	534.3	67.9		101.4	84.9	8.8	3025.7
21-May-15 10:31:00	530.7	66.8		100.6	85.1	8.3	3039.2
21-May-15 10:32:00	522.0	69.1		99.3	85.3	7.9	3039.8
21-May-15 10:33:00	519.9	69.7		96.8	84.8	7.8	3028.3
21-May-15 10:34:00	520.8	68.8		93.0	84.7	7.9	3033.0
21-May-15 10:35:00	529.3	69.6		90.2	84.6	8.0	3029.4
21-May-15 10:36:00	515.7	67.8		87.9	85.1	8.5	3016.6
21-May-15 10:37:00	518.2	69.2		89.6	84.5	9.1	3029.7
21-May-15 10:38:00	523.4	67.1		89.9	84.7	9.4	3012.5
21-May-15 10:39:00	521.5	67.3		92.6	84.8	9.6	3031.7
21-May-15 10:40:00	514.5	68.2		95.2	84.3	9.6	3006.7
21-May-15 10:41:00	517.9	65.9		97.6	83.9	9.7	3006.0
21-May-15 10:42:00	515.9	67.9		96.8	83.7	9.7	3021.9
21-May-15 10:43:00	519.9	69.0		98.1	84.0	9.4	3017.1
21-May-15 10:44:00	527.8	68.5		98.3	84.4	9.0	3009.8
21-May-15 10:45:00	525.1	69.4		99.1	85.6	8.8	3037.7
21-May-15 10:46:00	521.5	69.5		99.6	86.1	8.7	3030.3
21-May-15 10:47:00	521.0	69.0		99.7	85.5	8.7	2794.8

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 10:48:00	503.6	71.4		99.8	83.6	8.6	2996.7
21-May-15 10:49:00	500.2	70.6		99.3	80.5	8.7	3001.7
21-May-15 10:50:00	502.2	70.3		101.2	77.6	8.6	3015.4
21-May-15 10:51:00	508.9	70.5		100.7	78.3	8.6	2997.7
21-May-15 10:52:00	516.0	70.8		101.1	81.0	8.6	3012.1
21-May-15 10:53:00	524.5	69.9		103.1	83.7	8.8	3015.5
21-May-15 10:54:00	533.8	71.1		103.3	85.3	9.0	2994.5
21-May-15 10:55:00	541.2	70.1		104.7	86.7	9.1	2989.4
21-May-15 10:56:00	537.9	69.0		104.3	86.0	8.9	2985.5
21-May-15 10:57:00	532.6	68.6		104.0	86.0	8.8	2974.9
21-May-15 10:58:00	529.7	69.5		105.0	86.2	8.3	2982.6
21-May-15 10:59:00	523.1	68.6		106.2	86.0	8.3	2982.7
21-May-15 11:00:00	514.4	69.0		105.0	84.6	8.4	2963.5
21-May-15 11:01:00	504.7	68.1		103.6	83.2	8.7	3019.7
21-May-15 11:02:00	509.0	69.5		103.1	79.9	9.1	3012.7
21-May-15 11:03:00	515.8	70.5		104.5	81.4	9.4	3014.5
21-May-15 11:04:00	518.0	69.6		106.1	82.8	9.6	3016.5
21-May-15 11:05:00	516.5	71.7		109.3	83.2	9.6	2992.1
21-May-15 11:06:00	524.2	69.6		111.7	84.4	9.6	2999.4
21-May-15 11:07:00	536.0	70.5		111.7	85.5	9.6	3011.5
21-May-15 11:08:00	525.3	70.7		115.6	86.0	9.2	3005.1
21-May-15 11:09:00	527.9	71.0		115.2	85.9	9.0	3022.4
21-May-15 11:10:00	521.1	68.5		112.7	85.9	8.7	3014.8
21-May-15 11:11:00	513.9	69.6		114.2	84.8	8.5	3016.9
21-May-15 11:12:00	507.6	67.7		113.4	84.2	8.3	3059.8
21-May-15 11:13:00	515.1	67.3		115.5	83.0	8.3	3038.2
21-May-15 11:14:00	514.6	68.7		114.2	83.2	8.4	3018.8
21-May-15 11:15:00	516.9	69.1		112.4	83.4	8.8	3020.4
21-May-15 11:16:00	523.5	68.9		112.2	83.6	9.2	3021.4
21-May-15 11:17:00	533.8	66.9		113.9	85.0	9.5	3016.5
21-May-15 11:18:00	524.7	68.0		114.8	85.7	9.4	3024.7
21-May-15 11:19:00	529.5	68.9		115.4	85.9	9.5	2998.9
21-May-15 11:20:00	531.8	68.2		116.5	86.2	9.4	3021.0
21-May-15 11:21:00	525.3	67.7		115.5	85.4	9.2	3051.5
21-May-15 11:22:00	528.2	67.9		115.6	85.6	8.8	3017.8
21-May-15 11:23:00	524.6	65.8		114.7	85.7	8.8	3026.8
21-May-15 11:24:00	520.4	66.3		115.0	85.3	8.8	3008.0
21-May-15 11:25:00	512.2	64.8		115.3	84.4	8.9	3009.4
21-May-15 11:26:00	510.6	65.1		116.2	81.2	9.2	3031.5
21-May-15 11:27:00	522.1	64.8		117.7	82.8	9.3	3010.5
21-May-15 11:28:00	515.9	58.8		118.5	84.0	9.4	3021.3
21-May-15 11:29:00	522.0	61.5		119.3	83.9	9.5	3025.2
21-May-15 11:30:00	528.9	61.8		118.8	84.6	9.5	3029.8
21-May-15 11:31:00	529.2	60.6		118.8	85.7	9.5	3021.2
21-May-15 11:32:00	523.9	61.7		120.4	85.9	9.4	3024.4
21-May-15 11:33:00	514.5	61.6		121.4	85.5	9.3	2931.0
21-May-15 11:34:00	516.2	61.4		122.3	84.0	9.1	2969.9
21-May-15 11:35:00	518.4	60.2		122.4	84.1	8.9	3015.8
21-May-15 11:36:00	516.5	59.7		119.3	84.0	9.0	2943.9
21-May-15 11:37:00	519.6	60.0		120.2	84.1	9.0	2938.7
21-May-15 11:38:00	518.1	59.3		121.2	84.0	9.1	3014.5
21-May-15 11:39:00	538.1	59.9		122.3	84.3	9.2	3037.3
21-May-15 11:40:00	532.1	58.7		120.5	86.2	9.4	2997.9
21-May-15 11:41:00	527.7	58.9		121.2	86.0	9.4	2995.9
21-May-15 11:42:00	527.2	60.0		121.8	85.9	9.4	2898.8
21-May-15 11:43:00	520.2	58.4		123.1	85.7	9.4	2916.6

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 11:44:00	517.7	59.6	123.0	85.3	9.4	2987.2
21-May-15 11:45:00	515.9	57.7	122.9	84.2	9.2	2911.6
21-May-15 11:46:00	512.9	59.8	120.9	83.5	9.3	2915.5
21-May-15 11:47:00	507.9	59.5	118.5	81.3	9.4	3019.6
21-May-15 11:48:00	514.0	60.8	119.0	81.8	9.5	2955.9
21-May-15 11:49:00	518.9	58.4	120.5	82.7	9.5	2935.9
21-May-15 11:50:00	516.4	60.4	118.9	83.6	9.1	2786.9
21-May-15 11:51:00	528.8	60.1	118.0	84.5	9.2	3014.7
21-May-15 11:52:00	521.9	58.6	118.2	85.2	9.2	3027.5
21-May-15 11:53:00	532.6	59.9	118.8	85.0	9.3	3029.4
21-May-15 11:54:00	523.9	58.8	117.1	85.9	9.3	3052.1
21-May-15 11:55:00	517.7	60.7	120.5	84.5	9.1	3019.2
21-May-15 11:56:00	518.9	59.4	120.8	85.0	8.9	3017.7
21-May-15 11:57:00	515.8	58.5	121.1	84.8	8.9	3030.2
21-May-15 11:58:00	514.6	59.5	121.7	84.5	9.0	3004.3
21-May-15 11:59:00	510.3	60.6	122.0	83.0	9.1	3027.0
21-May-15 12:00:00	512.1	60.0	119.8	82.4	9.3	3034.5
21-May-15 12:01:00	508.9	59.8	122.9	82.9	9.4	3016.0
21-May-15 12:02:00	513.0	60.9	123.7	81.8	9.4	3024.3
21-May-15 12:03:00	517.6	60.7	122.4	82.4	9.5	3032.5
21-May-15 12:04:00	519.1	60.3	123.3	83.9	9.3	3036.1
21-May-15 12:05:00	534.6	60.9	123.6	84.9	9.4	3042.4
21-May-15 12:06:00	534.1	60.4	124.3	85.8	9.3	3025.4
21-May-15 12:07:00	533.3	61.7	126.3	86.1	9.1	3039.1
21-May-15 12:08:00	523.2	62.5	124.1	85.8	8.9	3040.2
21-May-15 12:09:00	518.4	61.5	126.5	84.9	8.9	2963.5
21-May-15 12:10:00	508.6	60.7	126.0	83.9	8.8	2977.8
21-May-15 12:11:00	507.3	60.8	125.1	81.2	8.8	3026.7
21-May-15 12:12:00	511.5	61.4	123.4	80.8	9.0	2989.5
21-May-15 12:13:00	512.4	60.6	125.5	82.2	9.2	2982.7
21-May-15 12:14:00	517.7	61.3	125.7	83.6	9.4	3037.5
21-May-15 12:15:00	520.2	62.4	125.6	83.6	9.6	2966.6
21-May-15 12:16:00	516.6	63.1	126.9	84.1	9.6	2984.3
21-May-15 12:17:00	528.1	62.5	128.9	84.7	9.6	3045.5
21-May-15 12:18:00	521.6	63.6	128.7	86.4	9.4	3039.6
21-May-15 12:19:00	525.2	64.3	128.3	86.0	9.0	3041.2
21-May-15 12:20:00	523.5	62.8	128.4	85.2	8.9	3044.5
21-May-15 12:21:00	515.5	62.8	128.5	85.0	8.8	3024.2
21-May-15 12:22:00	512.8	61.6	127.5	83.4	8.9	3031.7
21-May-15 12:23:00	515.3	60.3	126.8	83.0	8.9	3027.4
21-May-15 12:24:00	513.1	60.1	127.1	82.7	8.9	3034.5
21-May-15 12:25:00	521.3	60.1	128.4	83.3	8.9	3033.9
21-May-15 12:26:00	520.7	60.3	129.6	83.8	9.0	3008.5
21-May-15 12:27:00	523.8	61.4	129.0	85.2	9.2	3028.7
21-May-15 12:28:00	532.0	60.0	130.2	85.8	9.4	3004.3
21-May-15 12:29:00	527.7	60.4	127.9	86.0	9.4	2996.5
21-May-15 12:30:00	517.5	60.7	129.2	85.4	9.4	3004.4
21-May-15 12:31:00	511.0	61.6	129.6	84.8	9.3	2990.4
21-May-15 12:32:00	503.6	62.7	129.0	81.8	9.0	2988.1
21-May-15 12:33:00	506.4	63.0	128.2	79.6	8.8	2984.8
21-May-15 12:34:00	511.3	60.5	130.9	80.4	8.9	2997.9
21-May-15 12:35:00	518.2	62.0	128.9	81.1	8.9	3056.1
21-May-15 12:36:00	534.3	61.4	128.5	84.7	9.0	3018.3
21-May-15 12:37:00	529.0	60.0	128.8	86.0	9.0	3035.8
21-May-15 12:38:00	520.6	61.9	130.1	86.3	9.1	3033.2
21-May-15 12:39:00	521.4	61.8	130.3	85.5	9.2	3040.1

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 12:40:00	517.3	61.1		130.3	85.2	9.1	3027.0
21-May-15 12:41:00	513.5	61.0		127.1	83.8	8.8	3029.9
21-May-15 12:42:00	511.3	62.3		129.1	82.7	8.7	3048.8
21-May-15 12:43:00	520.4	63.2		127.1	83.2	8.7	3031.8
21-May-15 12:44:00	521.4	61.0		126.4	83.2	8.6	3035.3
21-May-15 12:45:00	522.0	63.3		127.5	84.5	9.0	3037.2
21-May-15 12:46:00	526.2	60.6		126.3	85.3	9.4	3035.2
21-May-15 12:47:00	522.3	61.6		125.8	86.0	9.4	3035.7
21-May-15 12:48:00	524.0	59.1		127.2	86.1	9.5	3031.7
21-May-15 12:49:00	517.8	60.0		126.6	86.0	9.3	3022.0
21-May-15 12:50:00	510.6	60.0		127.0	84.1	9.1	3016.2
21-May-15 12:51:00	512.8	60.5		127.6	82.3	9.1	3041.8
21-May-15 12:52:00	515.7	58.4		124.3	82.9	9.0	2752.4
21-May-15 12:53:00	512.7	59.8		128.3	82.1	9.1	3037.4
21-May-15 12:54:00	515.9	62.1		126.4	83.1	9.2	3045.1
21-May-15 12:55:00	516.1	58.6		126.5	82.9	9.2	3019.6
21-May-15 12:56:00	526.8	60.0		126.2	83.7	9.3	3035.6
21-May-15 12:57:00	534.9	58.3		125.1	84.5	9.2	3035.9
21-May-15 12:58:00	527.0	59.6		125.2	86.2	9.2	3045.6
21-May-15 12:59:00	530.0	59.8		123.6	85.8	9.1	3050.1
21-May-15 13:00:00	520.6	58.1		124.7	85.8	9.1	3031.9
21-May-15 13:01:00	525.9	56.5		126.1	86.0	8.9	3037.9
21-May-15 13:02:00	519.8	56.6		124.0	84.6	8.8	3023.9
21-May-15 13:03:00	507.3	55.9		125.4	83.2	8.9	3044.3
21-May-15 13:04:00	514.1	54.9		124.9	83.3	9.1	3024.9
21-May-15 13:05:00	509.4	54.0		125.3	82.9	9.3	3012.2
21-May-15 13:06:00	515.0	54.5		124.6	81.4	9.5	2996.1
21-May-15 13:07:00	523.2	54.3		123.8	83.3	9.6	3015.4
21-May-15 13:08:00	528.0	56.3		123.9	84.0	9.5	3014.9
21-May-15 13:09:00	528.9	55.3		126.4	85.0	9.5	3012.6
21-May-15 13:10:00	522.2	55.0		126.1	86.0	9.6	3013.3
21-May-15 13:11:00	519.8	54.6		125.0	85.4	9.4	2996.3
21-May-15 13:12:00	522.4	55.2		124.4	84.8	9.3	3017.3
21-May-15 13:13:00	515.3	53.4		125.7	84.5	9.0	2993.3
21-May-15 13:14:00	513.7	54.8		125.4	83.2	8.9	2993.4
21-May-15 13:15:00	518.1	54.6		125.6	83.3	9.1	2984.8
21-May-15 13:16:00	523.7	55.5		124.6	83.9	9.2	2992.7
21-May-15 13:17:00	517.2	55.3		123.7	84.0	9.2	2940.5
21-May-15 13:18:00	519.2	56.4		122.8	83.6	9.4	2950.6
21-May-15 13:19:00	524.9	53.6		124.5	84.4	9.3	2963.8
21-May-15 13:20:00	526.7	53.4		124.0	85.1	9.2	2953.9
21-May-15 13:21:00	521.3	55.4		126.3	84.9	9.3	2966.0
21-May-15 13:22:00	522.2	55.1		127.5	84.8	9.3	2962.3
21-May-15 13:23:00	517.3	54.0		123.9	84.6	9.3	2929.7
21-May-15 13:24:00	514.0	54.4		125.2	84.0	9.2	2979.9
21-May-15 13:25:00	516.1	54.7		123.0	82.9	9.2	2979.8
21-May-15 13:26:00	518.6	53.5		123.7	82.6	9.2	2982.4
21-May-15 13:27:00	510.2	54.7		123.9	83.3	9.2	2994.7
21-May-15 13:28:00	513.1	55.1		123.0	81.7	9.3	2969.6
21-May-15 13:29:00	513.1	55.9		125.6	81.7	9.4	2986.3
21-May-15 13:30:00	514.7	55.3		125.7	83.2	9.3	2987.7
21-May-15 13:31:00	514.8	54.3		128.5	83.8	9.3	2976.1
21-May-15 13:32:00	519.8	56.7		126.6	84.0	9.3	2984.7
21-May-15 13:33:00	516.1	57.8		126.1	84.0	9.3	2908.9
21-May-15 13:34:00	512.3	59.6		127.7	84.4	9.1	2924.8
21-May-15 13:35:00	523.3	57.9		127.0	84.0	9.1	2992.5

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AL811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 13:36:00	532.1	52.9		124.7	84.9	8.9	2887.7
21-May-15 13:37:00	525.9	53.8		126.7	85.6	8.8	2894.6
21-May-15 13:38:00	515.5	53.2		124.9	85.2	8.9	2992.5
21-May-15 13:39:00	520.0	53.0		125.6	83.9	9.1	2991.3
21-May-15 13:40:00	520.7	51.7		124.7	84.2	9.2	2994.4
21-May-15 13:41:00	522.8	52.0		123.7	84.4	9.4	2991.5
21-May-15 13:42:00	514.5	52.5		126.2	84.4	9.4	2910.3
21-May-15 13:43:00	519.0	54.0		125.3	83.6	9.3	2907.0
21-May-15 13:44:00	525.7	53.2		126.1	84.3	9.5	2984.5
21-May-15 13:45:00	519.5	53.6		126.6	84.6	9.4	2907.6
21-May-15 13:46:00	521.1	54.2		124.6	84.5	9.5	2891.7
21-May-15 13:47:00	526.0	53.9		124.8	84.5	9.4	2923.3
21-May-15 13:48:00	515.7	54.0		124.9	84.4	9.4	2922.6
21-May-15 13:49:00	511.7	55.0		125.9	84.1	9.4	2919.4
21-May-15 13:50:00	516.5	54.4		126.7	84.1	9.3	2988.5
21-May-15 13:51:00	512.8	54.3		126.0	83.7	9.2	2994.0
21-May-15 13:52:00	520.4	56.3		125.7	83.8	9.2	2998.1
21-May-15 13:53:00	526.6	54.3		127.0	84.6	9.1	3005.8
21-May-15 13:54:00	521.1	57.1		125.7	84.0	9.0	2867.8
21-May-15 13:55:00	524.5	56.0		126.0	84.1	9.0	2916.8
21-May-15 13:56:00	517.9	55.6		126.3	84.8	9.1	2996.7
21-May-15 13:57:00	507.5	56.0		125.9	83.0	9.2	2992.1
21-May-15 13:58:00	509.5	55.4		126.2	81.1	9.2	3027.1
21-May-15 13:59:00	501.4	52.4		126.7	81.1	9.1	2994.0
21-May-15 14:00:00	498.9	53.4		127.2	77.9	9.1	2986.2
21-May-15 14:01:00	496.2	55.2		126.0	77.9	9.1	3008.3
21-May-15 14:02:00	513.1	54.3		125.2	79.3	9.2	2990.8
21-May-15 14:03:00	518.4	54.8		126.7	81.9	9.2	3011.9
21-May-15 14:04:00	525.6	56.5		128.1	83.6	9.1	2967.4
21-May-15 14:05:00	527.7	56.4		125.0	84.9	9.1	2985.2
21-May-15 14:06:00	529.8	57.2		126.6	86.0	8.9	2983.1
21-May-15 14:07:00	513.6	57.5		125.8	86.1	8.9	2955.8
21-May-15 14:08:00	522.9	58.8		126.0	85.0	8.8	2925.3
21-May-15 14:09:00	518.5	57.6		123.3	85.0	8.8	2928.7
21-May-15 14:10:00	521.5	58.4		124.8	84.5	8.7	2911.8
21-May-15 14:11:00	518.5	57.0		125.1	84.0	8.9	2897.4
21-May-15 14:12:00	527.5	56.4		124.0	84.7	8.9	2960.6
21-May-15 14:13:00	518.3	57.0		118.5	85.3	9.0	2958.6
21-May-15 14:14:00	524.4	60.2		120.3	84.0	9.2	2892.3
21-May-15 14:15:00	522.5	58.8		123.9	85.3	9.4	2941.6
21-May-15 14:16:00	520.7	56.9		124.0	84.9	9.3	2957.6
21-May-15 14:17:00	527.5	57.5		121.8	85.2	9.4	3006.7
21-May-15 14:18:00	508.9	56.7		121.9	84.6	9.3	2983.0
21-May-15 14:19:00	514.7	58.0		119.5	84.4	9.3	3014.5
21-May-15 14:20:00	519.3	56.8		115.8	83.9	9.1	3006.7
21-May-15 14:21:00	517.4	57.9		114.3	84.2	9.2	3015.0
21-May-15 14:22:00	522.6	57.6		110.0	84.1	9.1	3001.1
21-May-15 14:23:00	523.7	56.7		105.4	84.9	9.0	2988.5
21-May-15 14:24:00	519.3	57.2		100.7	84.8	9.1	2995.0
21-May-15 14:25:00	525.8	56.5		95.5	84.2	9.2	3002.1
21-May-15 14:26:00	525.6	57.5		91.7	85.3	9.2	2998.6
21-May-15 14:27:00	518.5	55.3		88.6	85.2	9.1	3016.2
21-May-15 14:28:00	514.1	56.9		86.7	84.6	9.0	3016.1
21-May-15 14:29:00	508.8	56.5		84.5	83.8	9.0	3008.9
21-May-15 14:30:00	505.0	56.8		81.2	82.3	8.9	3019.2
21-May-15 14:31:00	510.3	56.1		78.4	80.9	9.0	3013.8

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AL811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 14:32:00	513.1	56.4		77.9	80.5	9.1	3020.4
21-May-15 14:33:00	511.3	58.4		77.3	80.6	9.2	3022.4
21-May-15 14:34:00	521.0	58.6		76.8	82.1	9.4	3026.7
21-May-15 14:35:00	524.3	58.2		76.5	84.3	9.5	3033.7
21-May-15 14:36:00	531.4	56.4		76.9	85.6	9.4	3031.3
21-May-15 14:37:00	527.5	56.9		77.8	85.6	9.4	3009.2
21-May-15 14:38:00	533.3	57.1		79.1	85.5	9.3	3018.9
21-May-15 14:39:00	524.0	54.3		78.6	85.5	9.2	3029.1
21-May-15 14:40:00	520.3	55.1		79.3	85.6	9.1	3047.3
21-May-15 14:41:00	525.3	53.9		78.5	85.0	9.0	3026.1
21-May-15 14:42:00	519.1	52.9		78.8	84.8	9.1	3038.4
21-May-15 14:43:00	530.3	53.4		79.2	84.9	9.2	3019.4
21-May-15 14:44:00	537.9	51.9		77.8	86.2	9.6	3033.3
21-May-15 14:45:00	530.2	53.2		77.8	86.3	9.7	3028.5
21-May-15 14:46:00	525.7	52.6		79.7	86.0	9.7	3033.2
21-May-15 14:47:00	528.2	52.1		81.2	85.7	9.8	3041.9
21-May-15 14:48:00	514.0	52.8		83.9	85.4	9.9	3026.7
21-May-15 14:49:00	509.3	54.6		87.4	83.7	9.8	3031.2
21-May-15 14:50:00	510.2	51.8		88.2	82.4	9.8	3023.2
21-May-15 14:51:00	502.9	51.6		90.4	81.5	9.9	2995.6
21-May-15 14:52:00	508.0	52.0		93.3	79.7	9.8	3001.1
21-May-15 14:53:00	513.6	52.2		95.7	81.0	9.8	2991.6
21-May-15 14:54:00	523.1	51.9		100.9	83.3	9.8	2999.6
21-May-15 14:55:00	525.4	52.7		102.6	84.7	9.7	2996.3
21-May-15 14:56:00	519.0	52.7		103.0	85.5	9.7	2976.7
21-May-15 14:57:00	526.6	52.9		104.7	84.8	9.6	2812.0
21-May-15 14:58:00	520.7	51.2		106.0	85.1	9.4	3027.0
21-May-15 14:59:00	514.4	52.6		105.9	84.3	9.3	3020.6
21-May-15 15:00:00	513.2	52.2		102.9	83.0	9.3	3053.4
21-May-15 15:01:00	518.0	54.0		102.9	83.5	9.5	3027.5
21-May-15 15:02:00	505.8	53.7		102.6	83.0	9.4	3027.3
21-May-15 15:03:00	508.2	55.1		100.7	80.7	9.5	3014.9
21-May-15 15:04:00	516.7	54.7		102.1	81.5	9.6	3020.4
21-May-15 15:05:00	528.5	54.3		101.1	83.4	9.6	3020.9
21-May-15 15:06:00	522.3	56.3		99.1	85.2	9.6	3010.5
21-May-15 15:07:00	517.4	58.1		100.1	84.5	9.6	3021.1
21-May-15 15:08:00	519.9	57.5		99.9	84.5	9.6	3021.1
21-May-15 15:09:00	520.5	56.6		99.7	84.4	9.7	3034.8
21-May-15 15:10:00	511.0	54.1		101.3	84.0	9.6	3020.3
21-May-15 15:11:00	520.8	52.4		100.3	84.0	9.6	3035.3
21-May-15 15:12:00	520.5	50.4		99.4	84.5	9.6	3017.4
21-May-15 15:13:00	514.7	53.3		98.5	84.1	9.7	3021.1
21-May-15 15:14:00	501.6	53.2		99.5	82.2	9.7	3014.5
21-May-15 15:15:00	514.3	54.8		98.5	80.6	9.8	3050.5
21-May-15 15:16:00	516.0	52.5		98.8	81.8	9.8	3020.9
21-May-15 15:17:00	513.4	55.6		99.4	83.2	9.7	3020.1
21-May-15 15:18:00	516.8	55.1		98.4	82.9	9.7	3045.9
21-May-15 15:19:00	518.3	55.5		99.3	83.5	9.7	3031.2
21-May-15 15:20:00	524.9	53.5		99.2	84.1	9.7	3026.1
21-May-15 15:21:00	521.5	54.8		101.2	85.0	9.8	3026.4
21-May-15 15:22:00	523.2	53.5		101.4	84.7	9.7	3016.0
21-May-15 15:23:00	526.3	53.1		100.9	84.6	9.6	3036.4
21-May-15 15:24:00	523.4	52.3		100.0	85.7	9.5	3040.4
21-May-15 15:25:00	517.8	53.8		101.0	84.5	9.6	3043.2
21-May-15 15:26:00	522.2	53.0		102.1	85.0	9.6	3019.5
21-May-15 15:27:00	511.6	52.3		102.7	84.9	9.8	3035.9

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 15:28:00	514.1	52.7	101.1	83.0	9.8	3009.7
21-May-15 15:29:00	524.8	53.3	103.0	82.7	9.9	3039.6
21-May-15 15:30:00	514.8	51.8	101.4	84.2	10.0	3015.4
21-May-15 15:31:00	511.6	53.3	102.6	83.2	9.9	3003.6
21-May-15 15:32:00	513.9	53.2	102.7	83.0	10.0	2975.1
21-May-15 15:33:00	516.1	52.0	105.5	83.3	10.0	2942.4
21-May-15 15:34:00	521.4	52.8	105.1	83.6	9.8	2959.2
21-May-15 15:35:00	516.4	53.0	106.3	84.3	9.8	2949.3
21-May-15 15:36:00	510.8	53.0	105.4	84.0	9.8	2945.5
21-May-15 15:37:00	512.1	53.5	106.9	82.0	9.8	2899.7
21-May-15 15:38:00	511.5	54.0	106.0	82.6	9.8	2983.1
21-May-15 15:39:00	514.2	53.7	106.2	83.1	9.7	3007.1
21-May-15 15:40:00	513.7	54.4	107.3	83.4	9.3	2981.5
21-May-15 15:41:00	521.3	54.5	106.0	83.4	9.4	2790.7
21-May-15 15:42:00	530.7	54.0	104.5	84.1	9.5	2897.1
21-May-15 15:43:00	522.7	54.1	106.5	85.3	9.6	2912.7
21-May-15 15:44:00	527.2	55.6	105.2	85.4	9.6	2816.5
21-May-15 15:45:00	512.6	54.6	104.4	84.4	9.7	2942.1
21-May-15 15:46:00	508.8	55.1	103.9	82.6	9.6	2945.9
21-May-15 15:47:00	513.4	55.3	104.1	82.0	9.6	2979.0
21-May-15 15:48:00	517.8	54.2	104.0	81.7	9.6	2947.4
21-May-15 15:49:00	513.3	54.5	105.0	83.6	9.7	2968.6
21-May-15 15:50:00	514.9	55.1	103.7	83.5	9.7	3030.6
21-May-15 15:51:00	520.9	55.8	104.9	84.2	10.0	3023.5
21-May-15 15:52:00	511.2	55.1	104.9	83.9	10.0	3031.3
21-May-15 15:53:00	504.2	55.5	105.9	82.6	9.9	3018.3
21-May-15 15:54:00	513.5	57.0	104.9	81.3	10.0	3013.2
21-May-15 15:55:00	519.5	55.3	105.4	83.4	10.0	3029.8
21-May-15 15:56:00	515.7	55.2	107.0	83.3	9.7	3020.0
21-May-15 15:57:00	520.5	55.2	108.3	83.3	9.7	3001.5
21-May-15 15:58:00	522.3	54.8	105.9	84.3	9.7	3021.9
21-May-15 15:59:00	515.2	56.7	106.0	84.9	9.6	2726.0
21-May-15 16:00:00	515.8	55.4	106.2	83.9	9.6	3020.7
21-May-15 16:01:00	517.0	55.9	107.9	83.4	9.6	3011.0
21-May-15 16:02:00	517.3	55.8	106.7	83.4	9.6	3021.2
21-May-15 16:03:00	504.5	57.5	105.8	83.2	9.5	3023.0
21-May-15 16:04:00	504.5	57.8	105.6	80.3	9.5	3025.0
21-May-15 16:05:00	499.4	59.4	106.3	78.4	9.4	3024.3
21-May-15 16:06:00	514.1	59.4	103.5	78.2	9.6	3053.8
21-May-15 16:07:00	517.4	59.1	105.0	81.7	9.5	3022.7
21-May-15 16:08:00	522.7	59.2	105.2	83.6	9.5	2982.5
21-May-15 16:09:00	526.2	59.5	106.3	84.5	9.5	2980.6
21-May-15 16:10:00	524.6	60.1	103.9	84.6	9.5	3018.5
21-May-15 16:11:00	528.9	59.5	103.0	85.1	9.5	2994.2
21-May-15 16:12:00	520.7	58.2	104.3	85.8	9.3	2992.9
21-May-15 16:13:00	512.3	59.4	102.9	84.5	9.2	3080.8
21-May-15 16:14:00	516.3	60.4	103.2	83.9	9.2	2964.0
21-May-15 16:15:00	513.9	57.9	101.9	83.8	9.2	2969.4
21-May-15 16:16:00	514.1	57.7	101.5	82.6	9.1	3054.5
21-May-15 16:17:00	525.8	59.0	100.1	83.5	9.3	3023.0
21-May-15 16:18:00	514.0	58.3	100.1	84.4	9.6	3036.8
21-May-15 16:19:00	515.0	57.6	99.6	84.1	9.6	3029.5
21-May-15 16:20:00	509.4	57.4	98.6	83.5	9.8	3033.2
21-May-15 16:21:00	514.7	56.0	97.0	82.1	9.8	3026.6
21-May-15 16:22:00	505.0	55.8	99.0	81.7	9.6	3020.2
21-May-15 16:23:00	506.8	56.0	99.5	81.2	9.5	3008.9

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 16:24:00	507.9	58.8		98.6	80.8	9.3	3032.7
21-May-15 16:25:00	522.6	57.4		100.1	82.5	9.4	3013.3
21-May-15 16:26:00	517.6	59.0		100.8	83.6	9.3	3016.5
21-May-15 16:27:00	526.5	59.4		99.2	84.6	9.3	2994.1
21-May-15 16:28:00	520.2	58.9		98.5	85.1	9.4	2975.8
21-May-15 16:29:00	533.2	59.5		99.3	84.9	9.4	2983.1
21-May-15 16:30:00	511.0	58.4		100.5	85.3	9.4	2999.6
21-May-15 16:31:00	509.8	58.9		99.0	83.2	9.4	3001.8
21-May-15 16:32:00	513.2	57.9		98.2	82.0	9.3	3005.5
21-May-15 16:33:00	509.7	57.8		98.1	83.1	9.1	2996.8
21-May-15 16:34:00	514.7	60.0		97.6	81.9	9.3	3021.4
21-May-15 16:35:00	515.6	59.0		96.5	82.3	9.5	3021.9
21-May-15 16:36:00	530.7	59.6		97.8	84.1	9.6	3027.2
21-May-15 16:37:00	526.8	59.3		97.9	85.8	9.7	3028.2
21-May-15 16:38:00	523.3	59.2		96.2	85.9	9.7	3033.0
21-May-15 16:39:00	531.9	59.4		98.0	85.3	9.8	3027.8
21-May-15 16:40:00	519.4	58.7		97.6	85.8	9.8	3041.3
21-May-15 16:41:00	518.1	58.8		97.1	85.2	9.6	3027.1
21-May-15 16:42:00	517.9	57.9		98.3	84.6	9.4	3036.5
21-May-15 16:43:00	514.9	59.0		99.6	84.0	9.3	3034.8
21-May-15 16:44:00	509.8	59.0		98.3	83.4	9.4	3016.7
21-May-15 16:45:00	515.5	59.3		98.5	81.3	9.5	3019.7
21-May-15 16:46:00	521.0	57.8		97.2	82.9	9.7	3026.2
21-May-15 16:47:00	524.5	57.9		99.3	84.3	9.7	3007.8
21-May-15 16:48:00	519.3	57.0		99.3	84.5	9.8	3028.9
21-May-15 16:49:00	508.1	59.2		99.4	84.1	9.7	3037.4
21-May-15 16:50:00	509.0	60.2		98.8	83.0	9.6	3011.4
21-May-15 16:51:00	503.9	58.4		100.1	80.4	9.4	3039.7
21-May-15 16:52:00	517.1	58.7		99.5	81.7	9.3	3028.8
21-May-15 16:53:00	515.5	59.3		101.7	81.8	9.2	3031.7
21-May-15 16:54:00	520.7	59.9		100.2	83.3	9.2	3030.7
21-May-15 16:55:00	521.4	59.3		100.2	84.0	9.4	3030.2
21-May-15 16:56:00	521.9	58.7		99.9	84.4	9.6	3021.2
21-May-15 16:57:00	521.4	60.2		98.6	85.1	9.5	3028.8
21-May-15 16:58:00	517.1	60.2		100.1	85.0	9.4	3026.2
21-May-15 16:59:00	522.1	61.0		98.6	84.3	9.3	3017.7
21-May-15 17:00:00	520.7	59.7		97.0	83.9	9.3	3017.6
21-May-15 17:01:00	523.5	60.3		96.4	84.0	9.1	2735.2
21-May-15 17:02:00	521.8	60.4		96.3	84.2	9.3	3010.5
21-May-15 17:03:00	512.1	59.8		96.0	84.1	9.4	3006.4
21-May-15 17:04:00	514.5	62.4		96.9	83.7	9.5	3007.9
21-May-15 17:05:00	503.1	60.5		95.5	82.5	9.6	3014.2
21-May-15 17:06:00	503.5	61.6		96.5	79.0	9.5	3017.5
21-May-15 17:07:00	500.0	61.4		96.0	78.5	9.5	3018.4
21-May-15 17:08:00	502.6	60.6		95.5	78.3	9.4	3004.6
21-May-15 17:09:00	510.8	62.3		95.5	78.3	9.3	3008.3
21-May-15 17:10:00	523.4	61.9		97.8	82.7	9.3	3031.8
21-May-15 17:11:00	524.2	63.3		96.7	84.3	9.3	3012.9
21-May-15 17:12:00	527.7	65.6		97.7	84.9	9.2	3015.4
21-May-15 17:13:00	528.3	64.6		97.4	85.0	9.2	3029.2
21-May-15 17:14:00	532.2	63.0		100.1	84.9	9.1	3021.2
21-May-15 17:15:00	517.8	62.8		100.9	86.1	8.9	3037.2
21-May-15 17:16:00	517.5	63.2		104.7	85.0	8.9	3004.2
21-May-15 17:17:00	516.5	63.8		106.4	83.9	8.9	2995.0
21-May-15 17:18:00	509.7	63.2		111.7	83.2	9.0	2960.0
21-May-15 17:19:00	510.0	63.4		114.5	82.0	9.4	2957.0

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 17:20:00	517.5	62.7		118.3	82.6	9.7	2954.3
21-May-15 17:21:00	521.8	62.4		121.3	83.8	9.7	2968.8
21-May-15 17:22:00	524.1	63.6		126.8	84.8	9.6	2978.3
21-May-15 17:23:00	525.5	63.6		128.6	85.2	9.6	2975.1
21-May-15 17:24:00	524.9	64.6		131.2	85.1	9.6	2977.4
21-May-15 17:25:00	522.7	62.1		133.8	84.4	9.6	2974.8
21-May-15 17:26:00	505.2	62.8		134.2	83.7	9.4	3007.9
21-May-15 17:27:00	508.8	63.0		134.6	81.0	9.1	3009.2
21-May-15 17:28:00	502.6	62.7		136.9	80.8	8.7	3011.3
21-May-15 17:29:00	515.6	61.6		135.4	79.9	8.6	3008.0
21-May-15 17:30:00	509.3	62.7		137.1	82.2	8.6	2995.6
21-May-15 17:31:00	514.4	63.4		136.3	82.0	9.0	3003.2
21-May-15 17:32:00	519.0	62.7		135.7	83.3	9.2	2954.9
21-May-15 17:33:00	522.8	60.9		137.2	83.4	9.2	2951.9
21-May-15 17:34:00	535.2	60.4		137.6	84.6	9.2	2971.2
21-May-15 17:35:00	517.0	61.1		137.5	85.8	9.1	2971.4
21-May-15 17:36:00	502.7	65.9		136.1	83.3	9.1	2917.3
21-May-15 17:37:00	508.7	63.2		135.0	78.8	8.9	3068.0
21-May-15 17:38:00	495.6	64.6		137.5	79.9	8.9	3012.2
21-May-15 17:39:00	507.0	64.4		137.0	79.9	8.8	3004.9
21-May-15 17:40:00	515.9	65.0		136.4	80.0	8.9	3023.8
21-May-15 17:41:00	528.8	65.1		138.1	84.0	9.1	2934.3
21-May-15 17:42:00	528.2	63.3		136.8	86.0	9.2	2926.9
21-May-15 17:43:00	529.3	65.4		137.2	85.9	9.4	3056.0
21-May-15 17:44:00	513.4	65.4		136.0	84.9	9.2	2919.8
21-May-15 17:45:00	504.6	67.2		136.4	83.3	8.9	2916.4
21-May-15 17:46:00	504.4	66.2		136.9	81.7	8.5	3031.7
21-May-15 17:47:00	499.9	66.8		135.6	79.2	8.2	2935.3
21-May-15 17:48:00	497.4	66.6		134.7	78.3	8.2	2930.4
21-May-15 17:49:00	501.5	69.0		135.0	77.0	8.6	2993.0
21-May-15 17:50:00	516.1	69.1		133.5	79.3	9.2	3008.4
21-May-15 17:51:00	524.8	69.5		136.1	81.8	9.6	2990.4
21-May-15 17:52:00	531.1	68.2		136.3	85.1	9.6	2999.1
21-May-15 17:53:00	525.2	69.5		135.9	85.3	9.4	3016.5
21-May-15 17:54:00	523.9	69.8		135.9	85.8	9.1	2994.9
21-May-15 17:55:00	526.8	67.2		134.2	85.2	8.6	3008.7
21-May-15 17:56:00	523.5	67.0		132.5	85.7	8.2	3016.7
21-May-15 17:57:00	519.9	66.9		132.8	84.6	8.2	2999.0
21-May-15 17:58:00	509.6	66.7		130.0	84.0	8.3	2999.2
21-May-15 17:59:00	505.7	66.7		130.5	82.0	8.5	2982.6
21-May-15 18:00:00	517.4	66.2		127.2	82.1	8.8	2992.2
21-May-15 18:01:00	516.9	63.7		126.5	82.7	9.1	2990.4
21-May-15 18:02:00	520.1	63.1		125.0	83.3	9.2	3003.4
21-May-15 18:03:00	520.4	63.8		126.8	83.5	9.1	2852.5
21-May-15 18:04:00	520.2	65.3		127.9	84.0	9.0	2944.2
21-May-15 18:05:00	521.5	61.4		125.7	83.8	9.0	2985.9
21-May-15 18:06:00	523.0	63.2		127.0	84.0	8.9	2981.1
21-May-15 18:07:00	514.3	63.2		126.1	84.1	8.6	3006.8
21-May-15 18:08:00	520.1	63.2		126.8	83.6	8.5	2954.7
21-May-15 18:09:00	522.7	63.0		123.5	84.3	8.5	2918.0
21-May-15 18:10:00	521.0	62.8		123.1	84.2	8.4	2971.0
21-May-15 18:11:00	513.1	60.8		122.9	84.2	8.5	2914.9
21-May-15 18:12:00	511.5	64.1		123.8	83.6	8.6	2898.1
21-May-15 18:13:00	501.5	62.3		122.8	82.3	8.7	2996.5
21-May-15 18:14:00	508.4	64.8		122.8	79.5	8.8	2933.4
21-May-15 18:15:00	509.5	63.6		123.4	79.9	8.8	2931.7

Line 6 Waste Gas Stack (SV144) Process Data

Timestamp	AL811100 030-06 GREEN BALL TOTAL	AI811005 037-06-2 REJECT SCALE	LINE-6	AC811200 252-06-1 Kiln Gas MMBTU/HR	AC811201 242-06-2 PH Gas MMBTU/HR	AI812016 247-06-1 WG WET SCRUBBER PRES.	AI812107 247-06-1 SCRUBBER WTR FLOW GPM
21-May-15 18:16:00	512.8	64.4		122.2	81.2	8.8	3043.6
21-May-15 18:17:00	519.4	63.2		124.0	81.6	8.9	3021.0
21-May-15 18:18:00	521.1	63.4		123.5	82.7	9.0	3029.9
21-May-15 18:19:00	526.3	64.1		125.9	84.8	9.0	3031.4
21-May-15 18:20:00	528.4	63.6		122.7	84.7	9.0	3040.1
21-May-15 18:21:00	520.6	63.0		123.6	84.9	8.8	3044.7
21-May-15 18:22:00	514.9	60.9		123.6	84.2	8.4	3035.8
21-May-15 18:23:00	518.3	59.4		120.6	83.6	8.2	3022.6
21-May-15 18:24:00	523.4	58.3		121.0	83.4	8.2	3034.6
21-May-15 18:25:00	510.2	58.5		121.1	83.5	8.4	3039.4
21-May-15 18:26:00	500.0	59.7		120.5	82.0	8.8	3056.7
21-May-15 18:27:00	502.7	58.3		119.9	79.1	9.2	3036.1
21-May-15 18:28:00	501.0	58.4		120.4	78.2	9.3	3037.0
21-May-15 18:29:00	510.5	58.0		119.9	77.7	9.4	3027.8
21-May-15 18:30:00	509.7	58.8		121.9	79.2	9.4	3015.3
21-May-15 18:31:00	523.8	60.1		121.4	82.0	9.3	3027.5
21-May-15 18:32:00	528.6	59.2		122.4	84.7	9.3	3042.7
21-May-15 18:33:00	535.0	60.7		121.8	84.7	9.2	3039.2
21-May-15 18:34:00	526.9	61.1		121.3	85.1	9.0	3022.5
21-May-15 18:35:00	528.2	61.4		123.3	85.6	8.6	3026.4
21-May-15 18:36:00	513.6	61.6		120.7	85.0	8.4	3038.8
21-May-15 18:37:00	516.1	61.7		120.0	83.6	8.5	3018.6
21-May-15 18:38:00	514.0	60.9		120.7	83.5	8.4	3007.2
21-May-15 18:39:00	509.8	61.4		119.1	82.1	8.6	3019.2
21-May-15 18:40:00	517.6	63.9		120.2	81.9	8.8	3017.1

Appendix F

EPA Method 30B

U. S. Steel Corporation
Minntac
Mountain Iron, Minnesota

Barr Engineering Co.
July 06, 2015

EPA Method 30B MERCURY TEST RESULTS SUMMARY
Line 6 Waste Gas Stack (SV144)

Parameter	Run 1	Run 2	Run 3	Average
Test Date	5/21/2015	5/21/2015	5/21/2015	---
Test Period	0815	1315	1479	---
Test Duration, min.	120	120	120	---
Air Flow Rate				
dscfm	362,000	374,000	365,000	367,000
Mercury Sorbent Trap Loading, ng				
Trap A	65.00	60.50	80.40	68.63
Trap B	218.10	216.90	235.10	223.37
Mercury Concentration, µg/dscm				
Trap A	2.98	2.75	3.75	3.16
Trap B	3.13	3.05	3.96	3.38
Average	3.06	2.90	3.85	3.27
Mercury Concentration, ppmv				
Trap A	0.0004	0.0003	0.0004	0.0004
Trap B	0.0004	0.0004	0.0005	0.0004
Average	0.0004	0.0003	0.0005	0.0004
Mercury Emissions Rate, lb/hr				
Trap A	0.0041	0.0039	0.0051	0.0043
Trap B	0.0043	0.0043	0.0054	0.0046
Average	0.0042	0.0041	0.0053	0.0045

EPA Method 30B Calculation Summary
Determination of Total Vapor Phase Mercury Emissions

Line 6 Waste Gas Stack (SV144)

Data Entry	Symbol	Units	Run 1	Run 2	Run 3	Test Average
Test Date	-	-	5/21/2015	5/21/2015	5/21/2015	---
Test Period	-	-	0815	1315	1479	---
Barometric Pressure	P _{bar}	in. Hg	28.22	28.22	28.22	28.22
Dry Volumetric Flowrate at Standard Conditions (EPA Method 2)	Q _d	dscfm	362,399	374,430	364,968	367,266

Trap A Results

	Symbol	Units	Run 1	Run 2	Run 3	Test Average
Actual Dry Gas Meter Volume	V _{mA}	liters	23.977	24.427	24.049	24.151
Dry Gas Meter Calibration Factor	Y _A	-	1.0074	1.0074	1.0074	1.0074
Average Meter Temperature	T _{mIA}	degrees F	92	96	102	98
Average Absolute Meter Temperature (R) T _{mRA} = T _{mIA} + 460	T _{mRA}	degrees R	552	556	562	558
Meter Volume at Standard Conditions V _{mstd A} = 17.64 x (V _{mA} x 0.03531) x Y _A x P _{bar} / T _{mRA}	V _{mstd A}	cubic feet	0.769	0.778	0.758	0.768
Laboratory Results			0.021781			
Trap ID	---	---	OL255857	OL255897	OL255903	---
Mercury Sorbent Trap, Section 1	M _{1A}	ng	65.00	60.50	80.40	68.63
Mercury Sorbent Trap, Section 2	M _{2A}	ng	0.00	0.00	0.00	0.00
Mercury, Total amount collected	M _A	ng	65.00	60.50	80.40	68.63
Amount of Mercury in spiked traps-from laboratory	M _{spike A}	ng	0	0	0	---
Mercury Stack Concentration C _{(ug)A} = (M _A - M _{spikeA}) / 1000 / V _{mstdA} x 0.0283168	C _{(ug)A}	ug/dscm	2.984	2.747	3.745	3.159
Mercury Stack Concentration C _{(ppm)A} = (M _A - M _{spike A}) / 1000 / 200.5920 x 24.04 / (V _{mstd A} x 28.32)	C _{(ppm)A}	ppm	0.00036	0.00033	0.00045	0.00038
Mercury Emission Rate E _{(lb/hr)A} = (M _A - M _{spike A}) x (2.2046x10 ⁻¹² (lb/ng)) x Q _d x60 / V _{mstd A}	E _{(lb/hr)A}	lb/hr	4.051E-03	0.0039	0.0051	0.0043

Trap B Results

	Symbol	Units	Run 1	Run 2	Run 3	Test Average
Actual Dry Gas Meter Volume	V _{mB}	liters	24.047	24.475	24.091	24.204
Dry Gas Meter Calibration Factor	Y _B	-	1.0063	1.0063	1.0063	1.0063
Average Meter Temperature	T _{mIB}	degrees F	94	98	101	99
Average Absolute Meter Temperature (R) T _{mRB} = T _{mIB} + 460	T _{mRB}	degrees R	554	558	561	559
Meter Volume at Standard Conditions V _{mstd B} = 17.64 x (V _{mB} x 0.03531) x Y _B x P _{bar} / T _{mRB}	V _{mstd B}	cubic feet	0.768	0.776	0.760	0.768
Laboratory Results						
Trap ID	---	---	OL269295	OL269395	OL269457	---
Mercury Sorbent Trap, Section 1	M _{1B}	ng	217.60	216.90	235.10	223.20
Mercury Sorbent Trap, Section 2	M _{2B}	ng	0.50	0.00	0.00	0.17
Mercury, Total amount collected	M _B	ng	218.10	216.90	235.10	223.37
Amount of Mercury in spiked traps-from laboratory	M _{spike B}	ng	150	150	150	---
Mercury Stack Concentration C _{(ug)B} = (M _B - M _{spikeB}) / 1000 / V _{mstdB} x 0.0283168	C _{(ug)B}	ug/dscm	3.133	3.046	3.956	3.378
Mercury Stack Concentration C _{(ppm)B} = (M _B - M _{spike B}) / 1000 / 200.5920 x 24.04 / (V _{mstd B} x 28.32)	C _{(ppm)B}	ppm	0.00038	0.00036	0.00047	0.00040
Mercury Emission Rate E _{(lb/hr)B} = (M _B - M _{spike B}) x (2.2046x10 ⁻¹² (lb/ng)) x Q _d x60 / V _{mstd B}	E _{(lb/hr)B}	lb/hr	0.0043	0.0043	0.0054	0.0046

EPA Method 30B QA/QC Data

	Symbol	Units	Run 1	Run 2	Run 3	Test Average
A Train Breakthrough -- each run <10% B _A = M _{2A} / M _{1A} x 100	B _A	%	0.0	0.0	0.0	0.0
B Train Breakthrough -- each run <10% B _B = M _{2B} / M _{1B} x 100	B _B	%	0.2	0.0	0.0	0.1
Sample volume agreement -- each run +/- 20% SV = 100 - ((V _{mstd A} / V _{mstd B}) x 100)	SV	%	-0.2	-0.3	0.2	-0.1
Field Recovery Test -- 3 run avg 85% < R > 115% R = (M _A / V _{mstd A} - M _B / V _{mstd B}) x V _{mstd A} / M _{spike A} x 100	R	%	102.2	104.4	103.0	103.2
Paired Trap Agreement -- each run <10% RD = ((C _{ugA} - C _{ugB}) / (C _{ugA} + C _{ugB})) x 100	RD	%	2.4	5.2	2.7	3.4



EPA Method 30B
FIELD DATA SHEET

Project U.S. Steel Corporation
Sample Location Line 6 Waste Gas Stack
Date 5/21/15
Operators TAK/RBS

Meter ID DVB
Meter A γ 1.0074
Meter B γ 1.0063
Sample Rate 0.20 lpm
Bar. Press. 28.22 in. Hg

Test 1
Run 1

Sample Time ΔT	Meter A Volume Vma, liters	Meter B Volume Vmb, liters	Stack Temp °F	Sample A Vacuum, in Hg	Sample B Vacuum, in Hg	Sorbent Ts, °F	Probe Tp, °F	Meter A Outlet Temp	Meter B Outlet Temp	Notes
(0915)	0.00	0.00								
5	1.02	1.16	14.29	<2	<2	300	299	97	99	
10	2.1076	2.40		<2	<2	299	299	97	99	
15	3.188	3.542		<2	<2	298	298	97	99	
20	4.133	4.333		<2	<2	299	300	97	98	
25	5.156	5.064		<2	<2	299	300	96	98	
30	6.193	5.944		<2	<2	299	300	96	98	
35	7.231	7.123		<2	<2	299	300	96	98	
40	8.323	8.336		<2	<2	300	300	89	90	Process delay see method 29 RBS/TAK
45	9.393	9.431		<2	<2	300	300	89	91	
50	10.435	10.346		<2	<2	300	300	89	91	
55	11.469	11.458		<2	<2	300	300	89	91	
60	12.400	12.546		<2	<2	300	300	89	91	
65	13.439	13.502		<2	<2	300	300	90	92	
70	14.393	14.392		<2	<2	300	300	90	92	
75	15.412	15.218		<2	<2	300	300	90	92	
80	16.201	16.196		<2	<2	300	300	90	93	
85	17.135	17.124		<2	<2	300	300	91	93	
90	18.148	18.063		<2	<2	300	300	91	93	
95	19.066	19.023		<2	<2	300	300	91	93	
100	20.087	20.022		<2	<2	300	300	90	92	
105	21.182	21.285		<2	<2	300	300	91	93	
110	22.038	22.143		<2	<2	300	300	91	93	
115	23.005	23.030		<2	<2	300	300	91	94	
120	23.997	24.047		<2	<2	300	300	92	95	
\emptyset =	Vma=	Vmb=	Ts=					Tma=	Tmb=	

Pause
846
restart
1057

12:27 pm

Sample Train A Leak Rate (lpm)	Sample Train B Leak Rate (lpm)	Trap A ID	Trap B ID
Pretest <u>0.00</u> at <u>12</u> in Hg	Pretest <u>0.00</u> at <u>9</u> in Hg	Spike Y/N <u>N</u>	Spike Y/N <u>Y</u>
Posttest <u>0.00</u> at <u>7</u> in Hg	Posttest <u>0.00</u> at <u>5</u> in Hg	Spike Level <u>0</u>	Spike Level <u>150 mg</u>

DL255857
DL269295



EPA Method 30B
FIELD DATA SHEET

Project U.S. Steel Corporation
Sample Location Line 6 Waste Gas Stack
Date 5/21/15
Operators TAK/RBS

Meter ID 003
Meter A γ 1.0074
Meter B γ 1.0063
Sample Rate 0.2 lpm
Bar. Press. 28.22 in. Hg

Test 1
Run 2

Sample Time ΔT	Meter A Volume Vma, liters	Meter B Volume Vmb, liters	Stack Temp °F	Sample A Vacuum, in Hg	Sample B Vacuum, in Hg	Sorbent Ts, °F	Probe Tp, °F	Meter A Outlet Temp	Meter B Outlet Temp	Notes
(1312)	0.000	0.000								
5	1.010	1.005	M-29	<2	<2	300	300	94	96	
10	2.020	2.120		<2	<2	300	300	94	96	
15	2.988	3.232		<2	<2	300	300	94	96	
20	3.992	4.168		<2	<2	300	300	94	96	
25	4.928	5.105		<2	<2	300	300	95	97	
30	5.997	6.020		<2	<2	300	300	95	97	
35	7.080	7.110		<2	<2	300	300	96	98	
40	7.945	7.857		<2	<2	300	299	96	98	
45	8.952	9.005		<2	<2	300	300	95	97	
50	9.912	10.016		<2	<2	300	300	95	97	
55	10.958	11.021		<2	<2	300	300	95	97	
60	11.986	12.112		<2	<2	300	300	96	98	
65	13.000	13.223		<2	<2	300	300	96	98	
70	14.010	14.234		<2	<2	300	300	96	98	
75	15.056	15.220		<2	<2	300	300	96	98	
80	16.099	16.176		<2	<2	300	300	96	98	
85	17.162	17.211		<2	<2	300	300	96	98	
90	18.250	18.168		<2	<2	300	300	97	99	
95	19.266	19.245		<2	<2	300	300	97	99	
100	20.268	20.192		<2	<2	300	300	98	100	
105	21.270	21.210		<2	<2	300	300	98	100	
110	22.384	22.364		<2	<2	300	300	99	101	
115	23.384	23.378		<2	<2	300	300	99	101	
120	24.427	24.475	↓	<2	<2	300	300	99	101	
0=	Vma=	Vmb=	Ts=					Tma=	Tmb=	

3:15 pm

Sample Train A Leak Rate (lpm)	Sample Train B Leak Rate (lpm)	Trap A ID	Trap B ID
Pretest <u>0.00</u> at <u>6</u> in Hg	Pretest <u>0.00</u> at <u>5</u> in Hg	<u>0L255897</u>	<u>0L269395</u>
Posttest <u>0.00</u> at <u>6</u> in Hg	Posttest <u>0.00</u> at <u>6</u> in Hg	Spike Y/N <u>N</u>	Spike Y/N <u>N</u>
		Spike Level <u>0</u>	Spike Level <u>1500g</u>



EPA Method 30B
FIELD DATA SHEET

Project U.S. Steel Corporation
Sample Location Line 6 Waste Gas Stack
Date 5/24/15
Operators TAKIRBS

Meter ID DV B
Meter A γ 1.0074
Meter B γ 1.0063
Sample Rate 0.2 lpm
Bar. Press. 28.22 in. Hg

Test 1
Run 3

Sample Time ΔT	Meter A Volume Vma, liters	Meter B Volume Vmb, liters	Stack Temp $^{\circ}F$	Sample A Vacuum, in Hg	Sample B Vacuum, in Hg	Sorbent Ts, $^{\circ}F$	Probe Tp, $^{\circ}F$	Meter A Outlet Temp	Meter B Outlet Temp	Notes
(1419)	0.000	0.000								
5	1.298	1.151	M-2A	<2	<2	300	300	102	101	
10	2.380	2.240		<2	<2	300	300	103	102	
15	3.280	3.160		<2	<2	300	300	103	102	
20	4.116	4.124		<2	<2	300	300	103	102	
25	5.051	5.021		<2	<2	300	300	103	101	
30	6.083	6.045		<2	<2	300	300	103	102	
35	7.098	7.067		<2	<2	300	300	104	103	
40	8.034	8.015		<2	<2	300	300	104	103	
45	9.003	8.985		<2	<2	300	300	104	103	
50	10.113	10.118		<2	<2	300	300	103	102	
55	11.018	11.123		<2	<2	300	300	102	102	
60	12.124	12.138		<2	<2	300	300	101	100	
65	13.144	13.156		<2	<2	300	300	100	99	
70	14.161	14.172		<2	<2	300	300	100	100	
75	15.098	15.105		<2	<2	300	300	100	100	
80	16.081	16.092		<2	<2	300	300	100	100	
85	17.079	17.066		<2	<2	300	300	101	100	
90	18.076	18.090		<2	<2	300	300	101	100	
95	19.78	19.95		<2	<2	300	300	101	100	
100	20.72	20.86		<2	<2	300	300	101	100	
105	21.100	21.098		<2	<2	300	300	101	100	
110	22.060	22.090		<2	<2	300	300	100	100	
115	23.113	23.185		<2	<2	300	300	100	100	
120	24.044	24.091		<2	<2	300	300	100	100	
Σ	Vma=	Vmb=	Ts=					Tma=	Tmb=	

End Time
6:19 PM

Sample Train A Leak Rate (lpm)

Pretest 0.000 at 5 in Hg
Posttest 0.00 at 5 in Hg

Sample Train B Leak Rate (lpm)

Pretest 0.000 at 7 in Hg
Posttest 0.00 at 7 in Hg

Trap A ID

Spike Y/N

Spike Level

01255903

N

0

Trap B ID

Spike Y/N

Spike Level

01269457

Y

150 Ng

Analysis Method: EPA 7473



Sorbent Trap Chain of Custody

71R1

Plant/Source: ISS Monitor Test Location: STACK

Boiler ID: 66 Waste Gas Stack Trap A B (Circle One)

☒ Unspiked

☐ Spiked At: _____

QA/QC Signature (Trap Maker) IMP

Certified Accuracy \pm 10%, Traceable to NIST

Lot Number: U-410

QA/QC Signature (Spiker) _____

Spike Date: _____ Spike Time: _____

☐ High Flow ☐ Coil Pre-filter ☐ 240 mm

☐ Static Pre-filter ☐ AGS ☒ 300 mm

☐ Fluffy Pre-filter ☐ 185 mm ☐ 450 mm

Estimated Hg in Section 1: _____ ng

Sampled By: _____

Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____ Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled
5/21/15							

Total/Average							
---------------	--	--	--	--	--	--	--

Chain of Custody

Relinquished by Tech.: <u>Tom Hall</u>	Date: <u>5/20/15</u>
Received by: _____	Date: _____
Relinquished by: _____	Date: _____
Received for Laboratory by: <u>Rylee Livingston</u>	Date: <u>June 4 2015</u>

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: February 2018

Trap ID



OL269295



Sorbent Trap Chain of Custody

Plant/Source: USS Mineral Test Location: SACK 71R1-spikeBoiler ID: LG Waste Gas Trap A (B) (Circle One)☐ Unspiked☒ Spiked At: 150ngCertified Accuracy \pm 10%, Traceable to NISTQA/QC Signature (Trap Maker) [Signature]Lot Number: S-85CQA/QC Signature (Spiker) [Signature]Spike Date: 4/29/2015 Spike Time: 1535

Estimated Hg in Section 1: _____ ng

☐ High Flow ☐ Coil Pre-filter ☐ 240 mm☐ Static Pre-filter ☐ AGS ☒ 300 mm☐ Fluffy Pre-filter ☐ 185 mm ☐ 450 mm

Sampled By: _____

Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____

Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled
5/26/15							
Total/Average							

Chain of Custody

Relinquished by Tech.: [Signature] Date: 5/26/15

Received by: _____ Date: _____

Relinquished by: _____ Date: _____

Received for Laboratory by: [Signature] Date: June 4 2015

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: April 2018



T4R2
72R4

Sorbent Trap Chain of Custody

Plant/Source: USS maintenance Test Location: STATIC

Boiler ID: L6 waste gas Trap (A) B (Circle One)

☒ **Unspiked** ☐ **Spiked At:** _____ QA/QC Signature (Trap Maker) mp
Certified Accuracy $\pm 10\%$, Traceable to NIST

Lot Number: U-410

QA/QC Signature (Spiker) _____

Spike Date: _____ Spike Time: _____

☐ High Flow ☐ Coil Pre-filter ☐ 240 mm
☐ Static Pre-filter ☐ AGS ☒ 300 mm
☐ Fluffy Pre-filter ☐ 185 mm ☐ 450 mm

Estimated Hg in Section 1: _____ ng

Sampled By: _____ Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____ Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled

Total/Average							
---------------	--	--	--	--	--	--	--

Chain of Custody

Relinquished by Tech.: Tom Herbert Date: 5/26/15
Received by: _____ Date: _____
Relinquished by: _____ Date: _____
Received for Laboratory by: Kyle Livingston Date: June 4 2015

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: February 2016

Trap ID



OL269395



TIRZ-Spike

Sorbent Trap Chain of Custody

Plant/Source: VSS Mountain Test Location: SteeleBoiler ID: Line 6 West Gas Trap A B (Circle One)
☐ Unspiked
 ☒ Spiked At: 150ng
Certified Accuracy \pm 10%, Traceable to NISTQA/QC Signature (Trap Maker) [Signature]Lot Number: S-85CQA/QC Signature (Spiker) [Signature]Spike Date: 4/29/2015 Spike Time: 1535

Estimated Hg in Section 1: _____ ng

☐ High Flow
 ☐ Coil Pre-filter
 ☐ 240 mm
☐ Static Pre-filter
 ☐ AGS
 ☒ 300 mm
☐ Fluffy Pre-filter
 ☐ 185 mm
 ☐ 450 mm
Sampled By: _____ Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____ Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled

Total/Average							
---------------	--	--	--	--	--	--	--

Chain of Custody

Relinquished by Tech.: <u>[Signature]</u>	Date: <u>5/26/15</u>
Received by: _____	Date: _____
Relinquished by: _____	Date: _____
Received for Laboratory by: <u>[Signature]</u>	Date: <u>June 4 2015</u>

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: April 2018



TUR3

Sorbent Trap Chain of Custody

Plant/Source: ISS mintac Test Location: stack

Boiler ID: line 6 waste gas Trap A B (Circle One)

☒ **Unspiked**

☐ **Spiked At:** _____
Certified Accuracy \pm 10%, Traceable to NIST

QA/QC Signature (Trap Maker) mf

Lot Number: U-410

QA/QC Signature (Spiker) _____

Spike Date: _____ Spike Time: _____

☐ High Flow ☐ Coil Pre-filter ☐ 240 mm

☐ Static Pre-filter ☐ AGS ☒ 300 mm

☐ Fluffy Pre-filter ☐ 185 mm ☐ 450 mm

Estimated Hg in Section 1: _____ ng

Sampled By: _____

Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____ Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled

Total/Average							
---------------	--	--	--	--	--	--	--

Chain of Custody

Relinquished by Tech.: <u>Tom Smith</u>	Date: <u>5/26/15</u>
Received by: _____	Date: _____
Relinquished by: _____	Date: _____
Received for Laboratory by: <u>Kyle Livingston</u>	Date: <u>June 4 2015</u>

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: February 2018

Trap ID



OL269457



Sorbent Trap Chain of Custody

7123 spike

Plant/Source: VSS mineralTest Location: stackBoiler ID: line 6 waste gasTrap A B (Circle One)☐ Unspiked☒ Spiked At: 150ngQA/QC Signature (Trap Maker) [Signature]Certified Accuracy $\pm 10\%$, Traceable to NISTLot Number: S-85CQA/QC Signature (Spiker) [Signature]Spike Date: 4/29/2015 Spike Time: 1535

Estimated Hg in Section 1: _____ ng

☐ High Flow ☐ Coil Pre-filter ☐ 240 mm☐ Static Pre-filter ☐ AGS ☒ 300 mm☐ Fluffy Pre-filter ☐ 185 mm ☐ 450 mm

Sampled By: _____

Type of Trap: 30B

Test Start (Date/Time) _____ Leak Check Pass/Fail _____

Test End (Date/Time) _____ Leak Check Pass/Fail _____

Date	Time	Duct Temp (°F or °C)	Sorbent Trap Temp (°F or °C)	Flow Rate (cc/min)	Dry Gas Meter Liters Initial	Dry Gas Meter Liters Final	Total Volume Pulled

Total/Average						
---------------	--	--	--	--	--	--

Chain of Custody

Relinquished by Tech.: <u>[Signature]</u>	Date: <u>5/26/15</u>
Received by: _____	Date: _____
Relinquished by: _____	Date: _____
Received for Laboratory by: <u>[Signature]</u>	Date: <u>June 4 2015</u>

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs.

For Analysis contact us:

Ohio Lumex Co., Inc. 9263 Ravenna Road Unit A-3, Twinsburg, OH 44087 USA

Phone 330-405-0837 Fax 330-405-0847 US Toll Free: 888-876-2611

Impregnated Activated Carbon – Refer to MSDS

Deactivated glass and glass wool

Best Before: April 2018



Request for Laboratory Analytical Services

№ 20107

Report Results To	Check One: <input type="checkbox"/> Barr Engineering Company 3128 14th Avenue East Hibbing, MN 55435-4803 (218) 262-8600 Attention: <u>Tom Kuchinski</u> (Print Name)		<input checked="" type="checkbox"/> Barr Engineering Company 5150 West 76th Street Edina, MN 55439-2330 (952) 832-2600 Attention: <u>952-832-2727</u> (Direct Phone No.)																	
	Project Number <u>23/69-1635.00</u>		Barr Engineering Company Attn: Accounts Payable 4700 West 77th Street Minneapolis, MN 55435-4803 Ph. (952) 832-2600 Fax (952) 832-2601 Barr Project Contact: (Print Name) <u>Accts Payable</u>																	
Special instructions and/or specific regulatory requirements: (method, limit of detection, etc.)																				
Sample Identification	Date/Time Collected	Media I.D. #	Type			METHOD	SAMPLE FRACTION												Total No. of Containers	Remarks
			Grab	Comp.	QC															
1. LG WGS TIR1	5/21/15	0L255857	X			✓												1		
2. TIR1 spike		0L269295	X	X		✓												1		
3. TIR2		0L255897	X			✓												1		
4. TIR2 spike		0L269395	X	X		✓												1		
5. TIR3		0L269457	X			✓												1		
6. TIR3 spike		0L269457	X	X		✓												1		
7. Blank TIR0	5/21/15	0L255904			X	✓												1		
8.																				
9.																				
10.																				
Chain of Custody	Collected by (Print Name): <u>Tom Kuchinski (BARR)</u>					Relinquished by:		Received by:		Date/Time:										
	Collector's Signature: <u>Tom Kuchinski</u> Date/Time: <u>5/21/15</u>					Signature: <u>Tom Kuchinski</u>				5/20/15 1500/										
	Laboratory: <u>Ohio Lumex</u>																			
	Method of Shipment: <input type="checkbox"/> Sampler <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS Other: _____																			
Sample Condition upon Receipt: <input type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)					Received at Lab by: <u>Anthony Schuman</u>				5/29/15 0949											



Vost Module Calibration Data Sheet

VOST Module Dual Vost B - Leak checks: Barometric Pressure: 29.40
Date: 5/5/2015 Negative -- Pass Previous Y: 0.9951
Technician: JAR2 @15 inHg. Previous Rate, l/min: 0.330

Rotometer Setting, LPM	Wet Test Volume, Cubic Feet	Dry Gas Meter Temp, °F	Wet Test Meter Temp, °F	Dry Gas Volume, Liters	Elapsed Time, Minutes		Meter Coefficient, Y	Sample Rate, LPM		
Nominal 0.20	Initial 7944.320	Initial 65.0	Initial 73.0	Total Final						
	Final 7945.320	Final 74.0	Final 73.0	Volume 27.891					Min 143.0	Sec 2.0
	Total 1.000	Average 69.5	Average 73.0						Total 143.033	
Nominal 0.20	Initial 7945.350	Initial 74.0	Initial 73.0	Total Final						
	Final 7946.350	Final 75.0	Final 72.5	Volume 28.26					Min 139.0	Sec 1.0
	Total 1.000	Average 74.5	Average 72.8						Total 139.017	
				Average		1.0074		0.20		



Vost Module Calibration Data Sheet

VOST Module Dual Vost B - 2 Leak checks: Pass Barometric Pressure: 28.87
 Date: 5/7/2015 Negative -- Previous Y: 1.0009
 Technician: DAH @15 inHg. Previous Rate, l/min: 0.320

Rotometer Setting, LPM	Wet Test Volume, Cubic Feet	Dry Gas Meter Temp, °F	Wet Test Meter Temp, °F	Dry Gas Volume, Liters	Elapsed Time, Minutes		Meter Coefficient, Y	Sample Rate, LPM
Nominal 0.20	Initial 7946.410	Initial 73.0	Initial 75.0	Total Final Volume 28.094				
	Final 7947.410	Final 75.0	Final 74.0		Min 120.0	Sec 7.0		
	Total 1.000	Average 74.0	Average 74.5		Total 120.117			
Nominal 0.20	Initial 7947.490	Initial 73.0	Initial 75.0	Total Final Volume 28.72				
	Final 7948.510	Final 75.0	Final 74.0		Min 123.0	Sec 9.0		
	Total 1.020	Average 74.0	Average 74.5		Total 123.150			
				Average		1.0063		0.23



PYROMETER CALIBRATION

Pyrometer Number: Dual Vost B Date: 12/23/2014
Pyrometer Reference: CL-300-100F Technician: DAH

Reference (°F)	Reference (°C)	Pyrometer ° F	
		Reading	Pass/Fail
1000	538	1000	Pass
950	510	951	Pass
900	482	900	Pass
850	454	851	Pass
800	427	800	Pass
750	399	751	Pass
700	371	701	Pass
650	343	651	Pass
600	316	600	Pass
550	288	549	Pass
500	260	497	Pass
450	232	449	Pass
400	204	398	Pass
350	177	349	Pass
300	149	298	Pass
250	121	250	Pass
200	93	199	Pass
150	67	150	Pass
100	38	97	Pass
50	10	49	Pass
0	-18	0	Pass
-50	-46	-51	Pass

Pass/Fail based on +/- 0.75% of Renkin value

Technician signature: *David Harbor*

QA signature: *[Signature]*



THERMOCOUPLE CALIBRATION

Dual Vost Meter

THERMOCOUPLE ID Dual Vost B1

Cal Date: 1/2/2015

CALIBRATION TECHNICIAN: DAH

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

12/27/2013

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	22.0	70.0	148.0
Difference (degrees)	2.0	0.0	2.0
TC Meets Method 5 Specifications: (± 5.4 °F)			

Technician signature

QA signature



THERMOCOUPLE CALIBRATION

Dual Vost Meter

THERMOCOUPLE ID Dual Vost B2

Cal Date: 1/2/2015

CALIBRATION TECHNICIAN: DAH

REFERENCE STANDARDS

Hart Scientific 9103-A s/n A1B289

Hart Scientific 9140 s/n A1B086

TRACEABILITY

Report No. B4116012

Report No. T10-0105-1

DATE

12/27/2013

12/18/2013

LABORATORY

Hart Scientific

Hart Scientific

Temperature Calibration Points	20	70	150
Reference Deg F (To)	20	70	150
Probe Temp (deg F)	21.0	70.0	149.0
Difference (degrees)	1.0	0.0	1.0
TC Meets Method 5 Specifications: (± 5.4 °F)			

Technician signature

QA signature

Appendix G

Stack Test Plan

Tom Kuchinski

Subject: FW: Audit Waiver Request
Attachments: U.S. Steel Minntac May 2015 TPAL.pdf; Certifications Form.doc; Microfiche or CD-ROM Submittal Form.doc; Operating Data Summary - Combustion Sources.doc; Operating Data Summary - Process Sources.doc; Performance Test Report Completeness Criteria.doc

From: Strzok, Ladislaus (MPCA) [<mailto:Ladislaus.Strzok@state.mn.us>]
Sent: Monday, July 06, 2015 12:07 PM
To: 'Stephani Campbell'
Cc: Tom Kuchinski
Subject: RE: Audit Waiver Request

From: Stephani Campbell [<mailto:SCampbell@uss.com>]
Sent: Friday, May 01, 2015 11:52 AM
To: Strzok, Ladislaus (MPCA)
Cc: Tom Kuchinski
Subject: Audit Waiver Request

Lad,

As discussed during the pretest call today, U.S. Steel-Minntac is requesting a waiver to obtain and analyze audit samples through the Stationary Source Audit Program for U.S. EPA Method 29 for mercury emission testing being performed in May of 2015. It is our understanding that granting the waiver is within MPCA authority. It is also our understanding that the current MPCA position is to grant these waivers when requested.

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

Thank You

Stephani Campbell
United States Steel
scampbell@uss.com

218-778-8684
218-929-7208 (cell)



**Minnesota Pollution
Control Agency**

520 Lafayette Road
St. Paul, MN 55155-4194

Air Performance Test Form
Performance Test Plan Approval

Facility Information (please print)

Facility name: U.S. Steel - Minntac (Permit No. 13700005-006) AQ#: 26A

Facility contact: Stephani Campbell, Environmental Control Engineer

Address: 8819 Old Hwy 169 (PO Box 417)

Phone: 218-778-8684

Line 3 Cooler Vent Stack (EU227/SV104) for TPM by M5/202 and Opacity by M9; and
GP022: Line 4 Cooler Vent Stack (EU263/SV119) for TPM by M5/202 and Opacity by M9; and
GP022: Line 6 Cooler Vent Stack (EU397/SV196) for TPM by M5/202 and Opacity by M9; and
GP022: Line 7 Cooler Vent Stack (EU398/SV197) for TPM by M5/202 and Opacity by M9; and
GP009: Line 3 Waste Gas Stack (SV103) for PM by M5/202, Opacity by M9 and Mercury by M29; and
GP010: Line 4 Waste Gas Stack (SV118) for PM by M5 and Mercury by M29; and
GP011: Agglomeration Lines 6 & 7 (SV144 & 151) for Mercury by M29; and

Unit(s) to be tested: GP021: Line 3 Cooler Dump Zone (SV105) for TPM by M5/202 and Opacity by M9

Scheduled for: Week(s) of May 4th, 11th, & 18th, 2015 at your facility located in: Mountain Iron, Minnesota.

Test Plan

Submitted on (date): April 16, 2015 Discussed on (date): May 1, 2015

Your test plan 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:

1. The requirement to perform audit sampling of select testing methods has been waived by the MPCA.
2. All periods indicating noncompliance with emission limits must be reported to the MPCA. This includes any periods of engineering tests. Operating at a rate other than that required by the current air permit must also be reported. Deviations ultimately need to be reported on the facility's semiannual deviation and annual compliance certification forms.
3. Electronic submittal of the test report will be considered acceptable as allowed by the letter from the MPCA dated March 3, 2010. In addition to the information relating to the test required by the letter also please include the emission unit(s) tested and the test date(s) as part of the notification email.
4. If a CD is submitted label should include: Facility Name, AQ File No., Emission Unit Designator, and Test Date.

Attached Forms

- ☒ Operating Data Summary – Combustion Sources ☐ Operating Data Summary – Waste Combustors
☒ Operating Data Summary – Process Sources ☐ Operating Data Summary – Asphalt Plants

- ☒ Certifications Form
☒ Performance Test Report Completeness Criteria

- ☒ Microfiche/CD-ROM Submittal Form

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

Approved by:



Lad Strzok, Environmental Specialist
Compliance and Enforcement Unit
Minnesota Pollution Control Agency

Date: May 1, 2015 (backdated on July 6, 2015)

Please contact me at 651-757-2295 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:

Air Quality Compliance Tracking Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

cc: Tom Kuchinski, Barr (email)

Steven Palzkill, MPCA (email)



U. S. Steel Corporation
Keetac
P. O. Box 217
Keewatin, MN 55753
218-778-8700

CERTIFIED MAIL # 7012 1640 0000 6703 5987

March 16, 2014

Mr. Lad Strzok
North District, Major Facilities
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155-4194

**Re: U. S. Steel - Minntac
Notification of Testing and Test Plan**

Dear Mr. Strzok,

This document is the Notification of Testing and Test Plan for performance tests on:

- Line 3 Cooler Vent Stack (SV104)
- Line 4 Cooler Vent Stack (SV119)
- Line 6 Cooler Vent Stack (SV196)
- Line 7 Cooler Vent Stack (SV197)
- Line 3 Waste Gas Stack (SV103)
- Line 4 Waste Gas Stack (SV118)
- Line 3 Cooler Dump Zone (SV105)

Performance tests are related to Air Emission Permit No. 13700005-006 (Title V permit) and 40 CFR Part 63 Subpart RRRRR.

Testing will also be performed on each Step for mercury pursuant to MN Rules 7019.3050.

TEST PLAN

Part 1. General Information

(1) Name and address of the emission facility.

U. S. Steel – Minntac
P.O. Box 417
8819 Old Hwy 169
Mountain Iron, Minnesota 55768

(2) Name, title and telephone number of contact person at the emission facility.

Stephani Campbell
Environmental Control Engineer
Voice (218) 778-8684 Fax (218) 749-7360
Electronic mail: scampbell@uss.com

- (3) Permit number or name of other applicable document.

Title V Air Emissions Permit 13700005-006
40 CFR Part 63 Subpart RRRRR – National Emission Standards for Hazardous Air
Pollutants: Taconite Iron Ore Processing

- (4) Reason for testing.

Determination of PM and opacity for Title V Permit.
Determination of PM for 40 CFR Part 63 Subpart RRRRR.
Determination of Hg for MN Rule 7019.3050

- (5) Schematic drawing of the stacks and sample ports.

Enclosed herein.

- ### a) Location of Plant

Within the corporate limits of the city of Mountain Iron, MN.

- b) Name, contact person, and telephone number for testing company

Barr Engineering, Minneapolis, MN.
Tom Kuchinski (952) 832-2787

Part 2. Testing Requirements

- (1) List of pollutants to be tested, the emission limit for each pollutant and the applicable rule or regulation for the emission limit.

Line 3 Cooler Vent Stack (SV104)

Particulate Matter

Emission limit Minn. R 7011.0715 subp. 1(A)

0.3 grains/dscf or the less stringent of 7011.0730 or 7011.0735

Opacity

Emission limit Minn. R 7011.0715 subp. 1(B)

Less than or equal to 20% except for one six-minute period per hour of not more than 60%.

**Group 022 Cooler Vent Stack for Steps II and III
Line 4 (SV119), Line 6 (SV196), and Line 7 (SV197)**

Particulate Matter

Emission limit Minn. R 7011.0715 subp. 1(A)

0.3 grains/dscf or the less stringent of 7011.0730 or 7011.0735

Opacity

Emission limit Minn. R 7011.0715 subp. 1(B)

Less than or equal to 20%.

Group 09 Agglomerator Lines 3 (SV103) Waste Gas Stack

Particulate Matter

Emission limit 40 CFR Part 63 Subpart RRRRR Table 1

Filterable portion PM limit of 0.01 gr/dscf

Emission limit Minn. R 7011.0715 subp. 1(A)

0.3 grains/dscf or the less stringent of 7011.0730 or 7011.0735

Opacity

Emission limit Minn. R 7011.0715 subp. 1(B)

Mercury Minn R.7019.3050

Group 10 Agglomerator Lines 4 (SV118) Waste Gas Stack

Particulate Matter

Emission limit 40 CFR Part 63 Subpart RRRRR Table 1

Mercury Minn. R.7019.3050

Group 111 Agglomerator Lines 6 (SV144) and 5 (SV 151) Waste Gas Stack

Mercury** Minn. R.7019.3050

** Performed on either Line 6 or Line 7

Group 21 Line 3 Cooler Dump Zone (SV105)

Particulate Matter

Emission limit

Minn. R 7011.0715 subp. 1(A)

0.3 grains/dscf or the less stringent of 7011.0730 or 7011.0735

SV105 is also subject to 40 CFR Part 63 Subpart RRRRR Table 1 as an overall source category flow-weighted average of filterable particulate matter of 0.008 gr/dscf.

Opacity

Emission limit

Minn. R 7011.0715 subp. 1(B)

Less than or equal to 20% except for one six-minute period per hour of not more than 60%.

- (2) Description of procedure for fuel sampling and analysis, where applicable.

Not applicable.

Part 3. Operating Conditions

- (1) List the process or operating rate and conditions of the process equipment and the air pollution control equipment for the test.

All tests will be performed while the associated process equipment is operating at greater than 90% of maximum capacity. Green ball feed rate range is approximately 280 to 350 for Line 3. The fuel will likely be a blend of natural gas and biomass. Green ball feed rate range is approximately 500 to 600 for Line 4. The fuel will likely be a blend of natural gas and biomass. Green ball feed rate range is approximately 500 to 600 for Lines 6 and 7. The fuel will likely be a blend of natural gas and biomass or natural gas and coal or natural gas.

- (2) Explanation of why the proposed conditions are considered to be in accordance with Part 7017.2025, Subpart 2, for required testing conditions.

For the Title V tests, the statement about the assumption of worst-case conditions in the cited subpart applies. For MACT, 40 CFR 63.9621 (a) requires performance test to be conducted according to the requirements in 40 CFR 63.7(e)(1) which states that tests should be based on representative performance (i.e., performance based on normal operating conditions) of the affected source.

- (3) List the range of process or operating rates for this emission unit.

The minimum process rate is zero. The maximum green ball feed process rate is approximately 350 for Line 3 and 600 LTPH for Lines 4, 6 and 7.

- (4) Descriptions of how air pollution control and process equipment will be monitored.
- There are no control devices on the cooler vent stacks (SV104, SV119, SV196, and SV 197).
 - Water flow and pressure drop will be monitored during each run on the waste gas stacks (SV103, and SV118).
 - Water flow and fan amps will be monitored during each run on SV105.
 - Process rates will be monitored during all tests.

Part 4. Test Methods

- (1) List of the methods to be used to determine the emission rate of each pollutant.

Test Port Location	EPA Method 1
Determination of velocity and volumetric flow	EPA Method 2
Determination of gas molecular weight	EPA Method 3
Determination of moisture content	EPA Method 4
Determination of PM	EPA Method 5
Determination of Condensable PM	EPA Method 202*
Opacity	EPA Method 9
Mercury	EPA Method 29
*original method (pre January 2011)	

- (2) Number of test runs, length of the test runs, and sampling rate for each method.

In accordance with the EPA Methods given above.

- Cooler Vent Stacks (SV104, SV119, SV196, and SV 197):
 - Three one-hour runs will be performed and a minimum of 32 dry standard cubic feet of sample will be collected for the determination of filterable and condensable particulate matter. One one-hour observation for opacity weather permitting.
- Waste Gas Stack (SV118):
 - Three two-hour runs will be performed for filterable particulate matter only.
- Waste Gas Stacks (SV 103) and Cooler Dump Zone (SV105):
 - Three two-hour runs will be performed for the determination of filterable and condensable particulate matter. One one-hour observation for opacity weather permitting.

- (3) Reference to any compliance document, federal regulation, or Minnesota rule or statute requiring use of specific methods or procedures.

Not applicable

- (4) Summary of reasons for proposing to use alternative or equivalent method.

For EPA Method 202, propose using original method (pre January 2011), with the exception of using hexane instead of the methylene chloride.

For EPA Method 5, the posttest meter calibration check will be performed using the alternative method.

An inconel probe liner will be utilized due to high gas temperatures of the cooler vent stacks.

- (5) For test methods other than reference methods, statement of the detection limit and the degree of accuracy of that method at the expected emission rate and under the conditions of the performance test.

None applicable

Test Schedule and Pretest Meeting

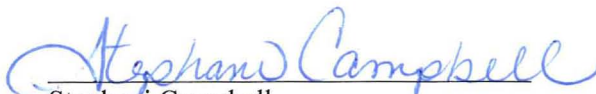
Testing will occur as follows:

- Week of May 4, 2014 – Test Lines 6 and 7 Cooler Vent Stacks and Step 3 Waste Gas (Hg only)
- Week of May 11, 2014 – Test Line 3-4 Cooler Vent Stacks and Line 3 Cooler Dump Zone
- Week of May 18, 2014 – Test Line 3-4 Waste Gas Stacks

At the preference of the MPCA, we would suggest the pretest meeting should occur the week prior to testing via telephone.

Closing Remarks

If there are any questions or comments on the information given in this document, please contact me at the telephone numbers listed above.

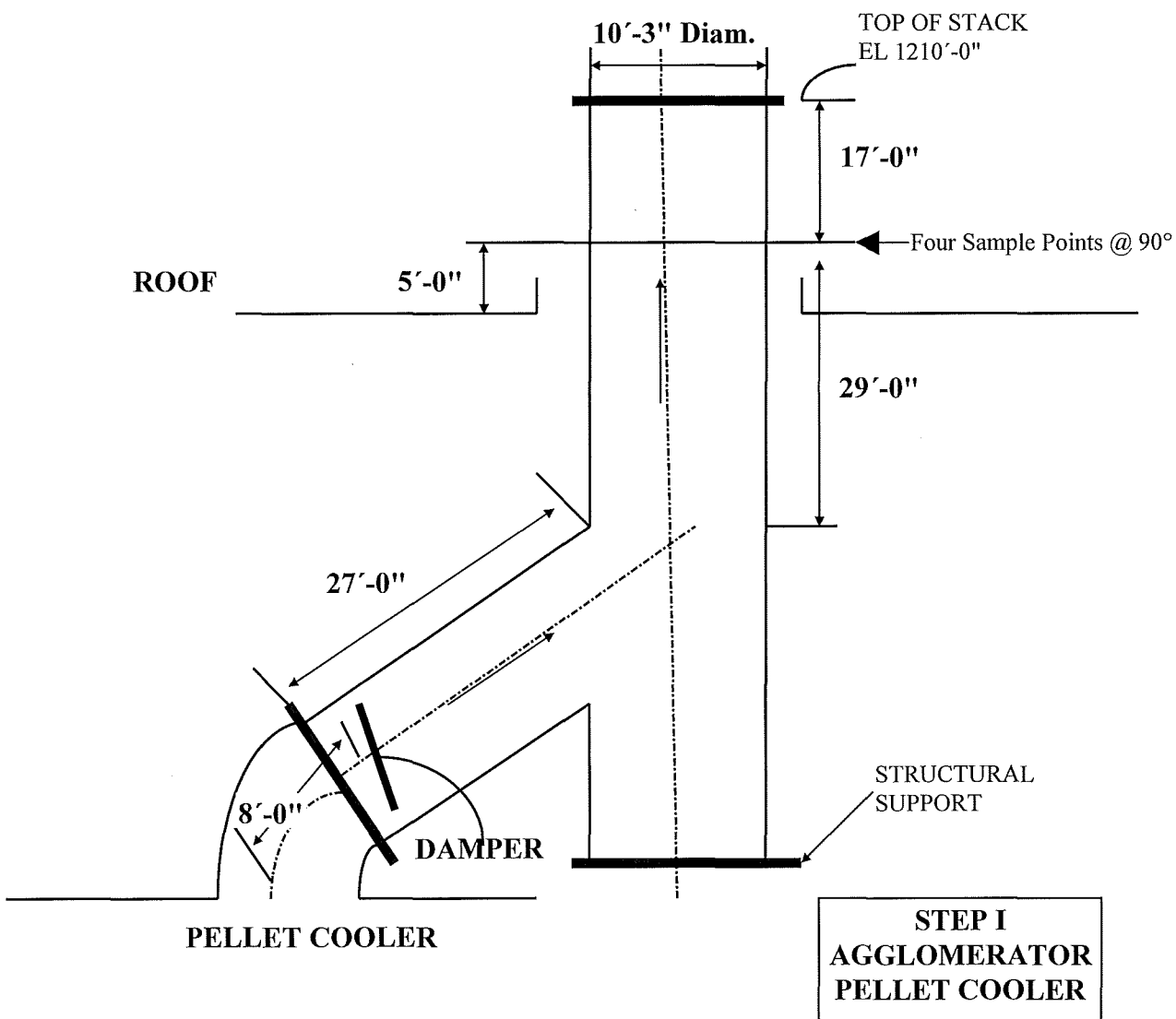


Stephani Campbell
Environmental Control Engineer

Enclosures:

STEP 1 AGG CVS drawing
STEP 2 AGG CVS drawing
STEP 3 AGG CVS drawing
STEP 1 AGG WG drawing
STEP 2 AGG WG drawing
298-03-8 (SV105) drawing

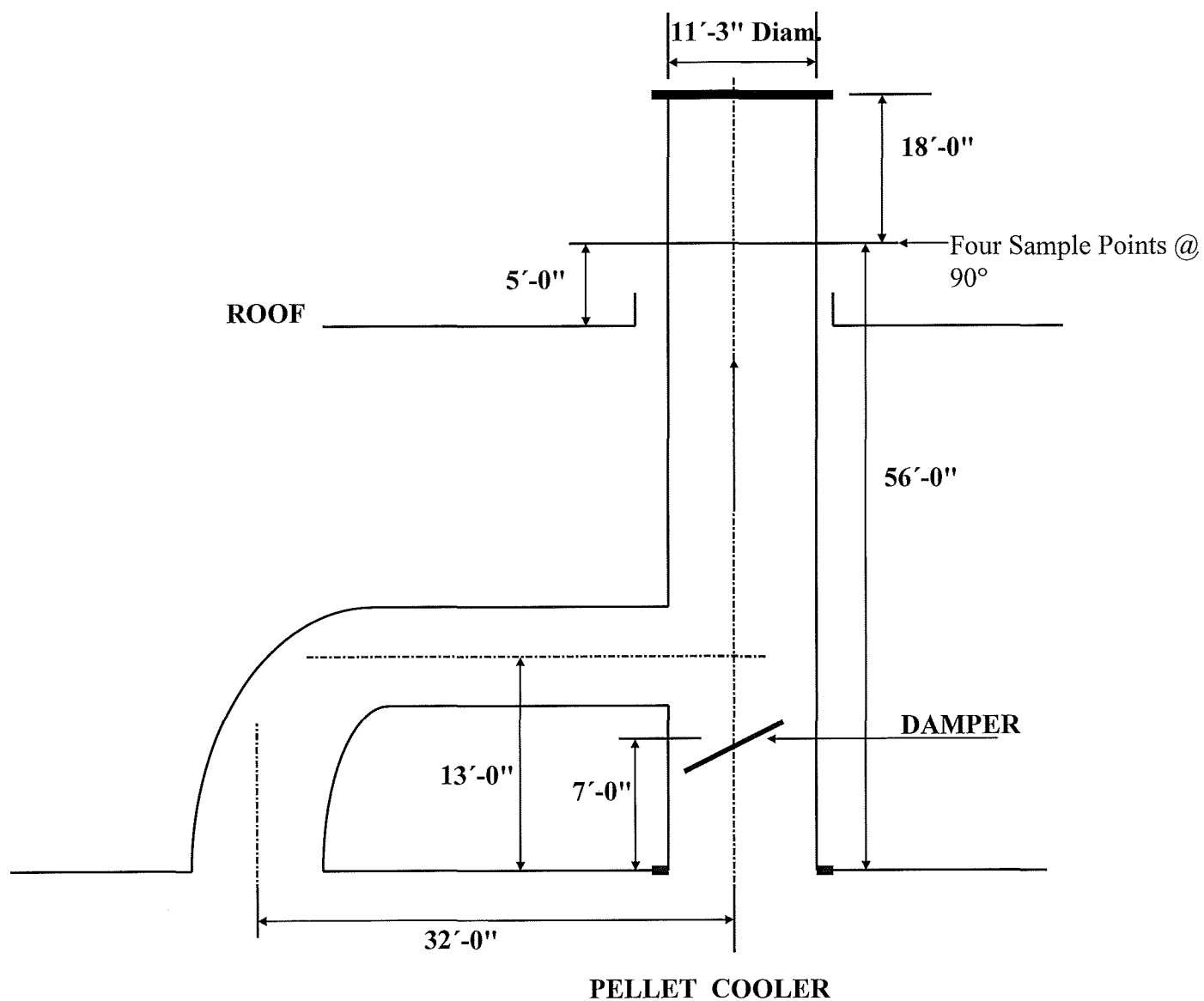
cc: Steve Palzkill, MPCA – Duluth Regional Office
Tom Kuchinski – Barr Engineering
Dan Koschak – Barr Engineering
Cliff Erickson – Minntac
Cory Bird – Minntac



Elevation View

1. Emission Source Number- SV 104
2. Emission Unit Number-227
3. Plant Equipment Number- 262-03-1
4. Stack Diameter-10'-3"

Step I Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, MN

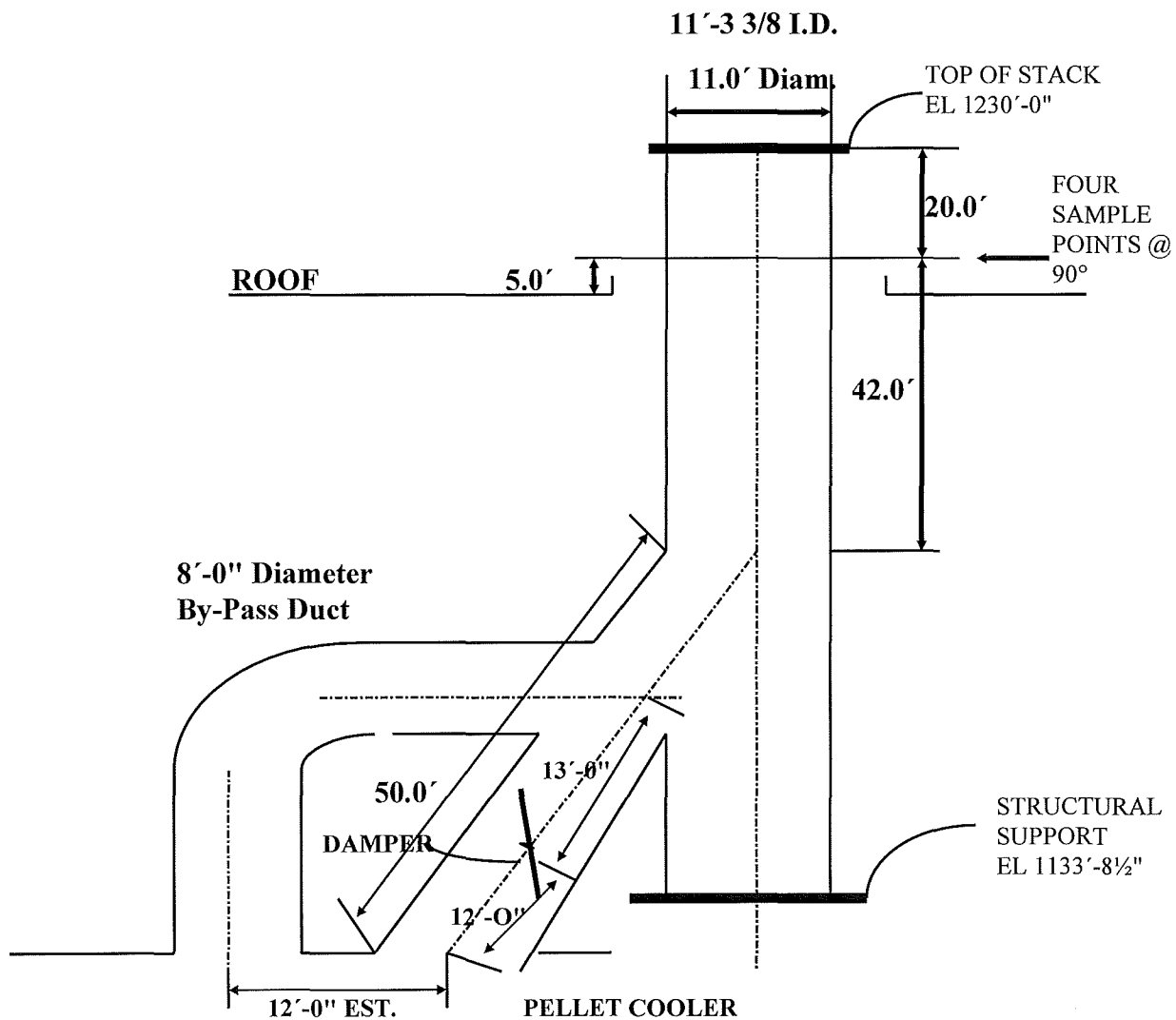


ELEVATION VIEW

1. Emission Source Number- SV 119 and SV 128
2. Emission Unit Number-263; 284
3. Plant Equipment Number- 262-04-1; 262-05-1
4. Stack Diameter- 11'-3"

**Lines 4 & 5
Agglomerator
Pellet Cooler**

Step II Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, MN



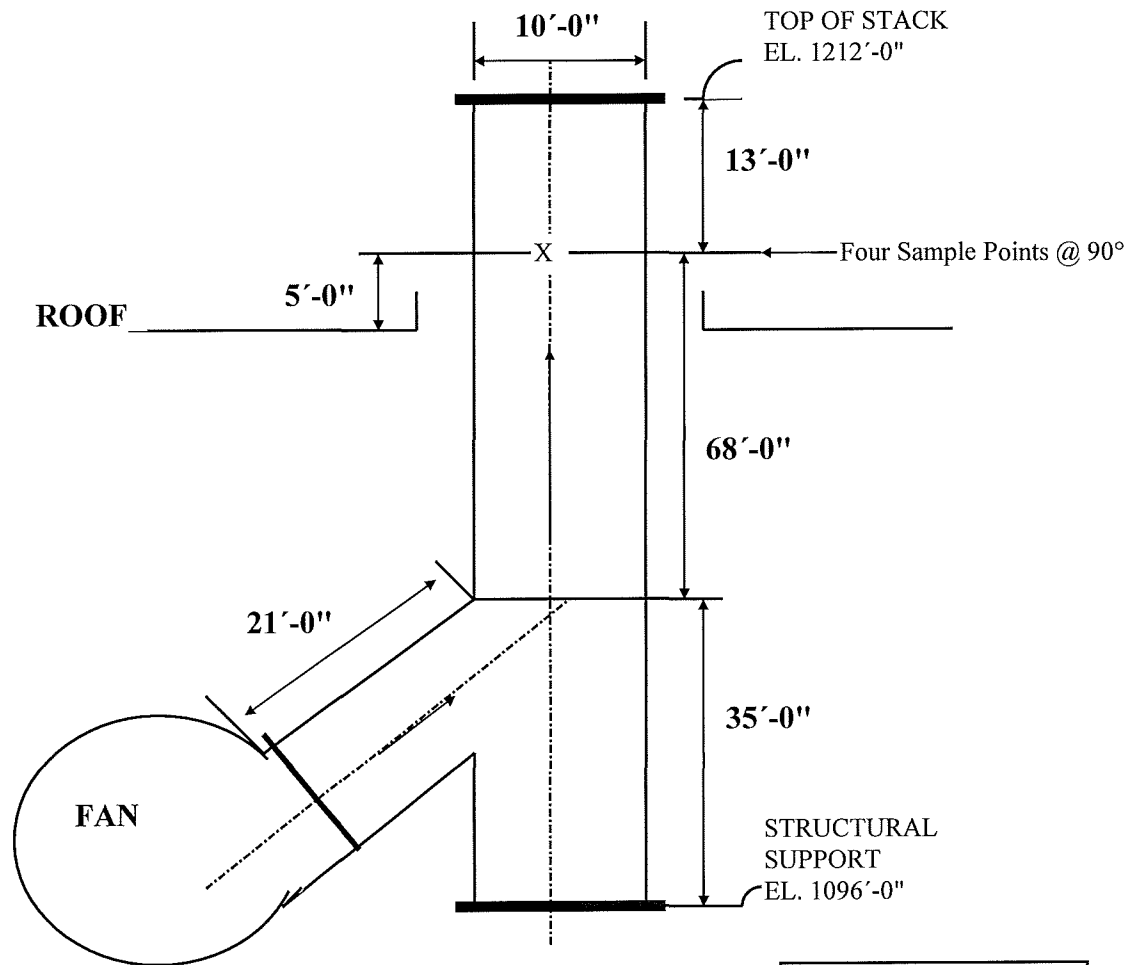
ELEVATION VIEW

1. Emission Source Number- SV 196 and SV 197
2. Emission Unit Number- 397, 398
3. Plant Equipment Number- 262-06-1; 262-07-1
4. Stack Diameter-11.0'.
5. Stack Design Gas Velocity- 31.6 FPS.
6. Stack Design Gas Volume- 180,000 CFM.
7. Stack Design Gas Temperature- 600-700°F.
8. Pollutant- Particulates

**Lines 6 & 7
Agglomerator
Pellet Cooler**

Grade El. 1074
12'-1" OD

Step III Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, Minnesota

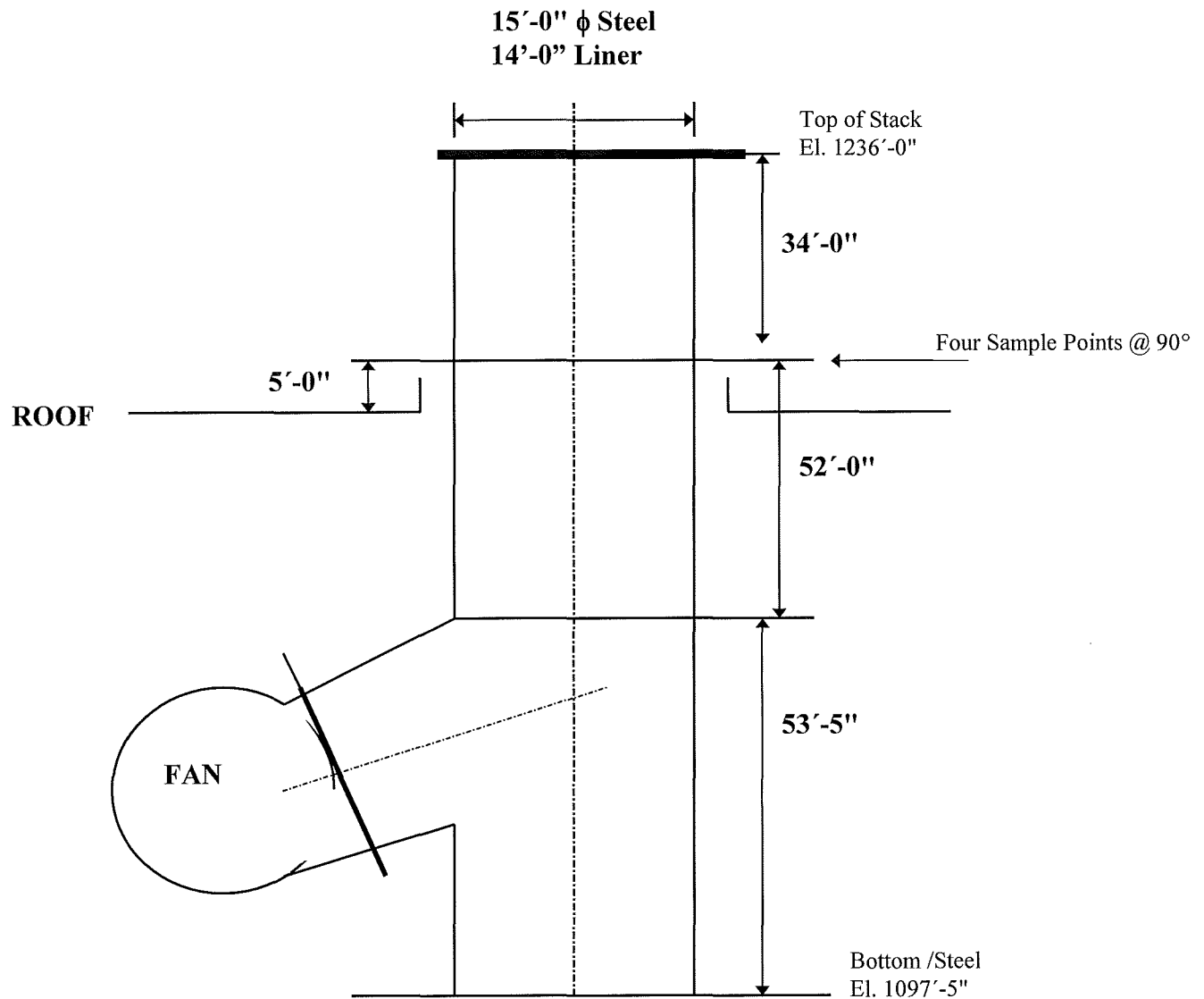


**STEP I
AGGLOMERATOR
WASTE GAS**

Elevation View

1. Emission Source Number- SV 103 (Old Source Number 8.3)
2. Emission Unit Number-223, 224, 225, 226
3. Plant Equipment Number- 242-03-2; 261-03-1; 252-03-1; 262-03-1
4. Stack Diameter- 10'-0"
5. Stack Design Gas Velocity- 56.8 FPS.
6. Stack Design Volume- 267,775 CFM.
7. Stack Design Temperature- 200°F.
8. Pollutants- Particulates and Combustion Emissions

Step I Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, MN

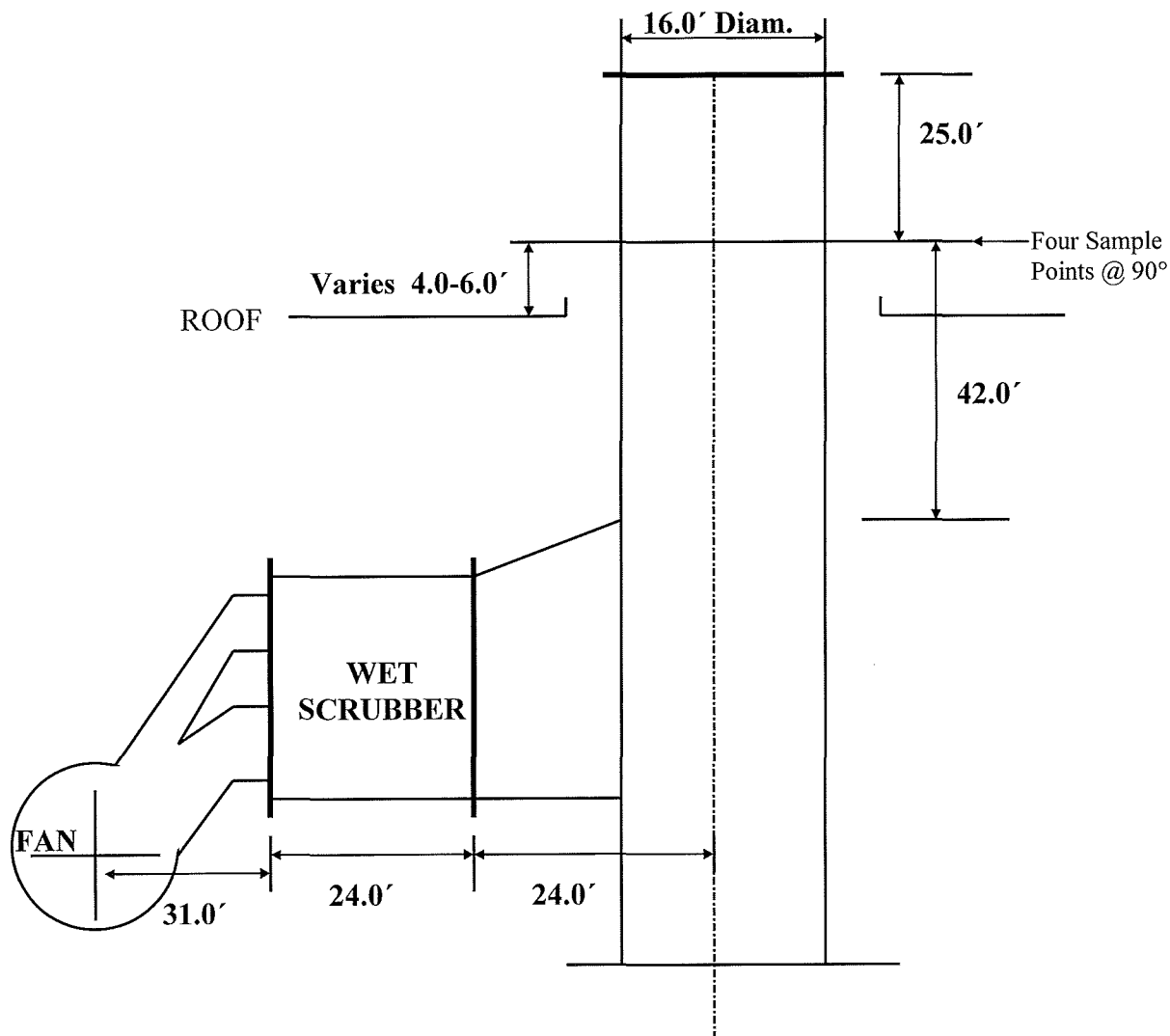


**STEP II
AGGLOMERATOR
WASTE GAS**

Elevation View

1. Emission Source Numbers- Line 4 SV 118, Line 5 SV 127
2. Emission Unit Number- Line 4 EU 259, 260, 261, 262 Line 5 EU 280, 282, 282, 283
3. Plant Equipment Number- 242; 261; 252; 262
4. Stack Diameter- 15.0' with 14'-0" diameter fiberglass liner
5. Stack Design Gas Velocity- 56.3 FPS
6. Stack Design Gas Volume- 591,000 CFM
7. Stack Design Gas Temperature- 125 to 150°F

Step II Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, MN



**STEP III
AGGLOMERATOR
WASTE GAS**

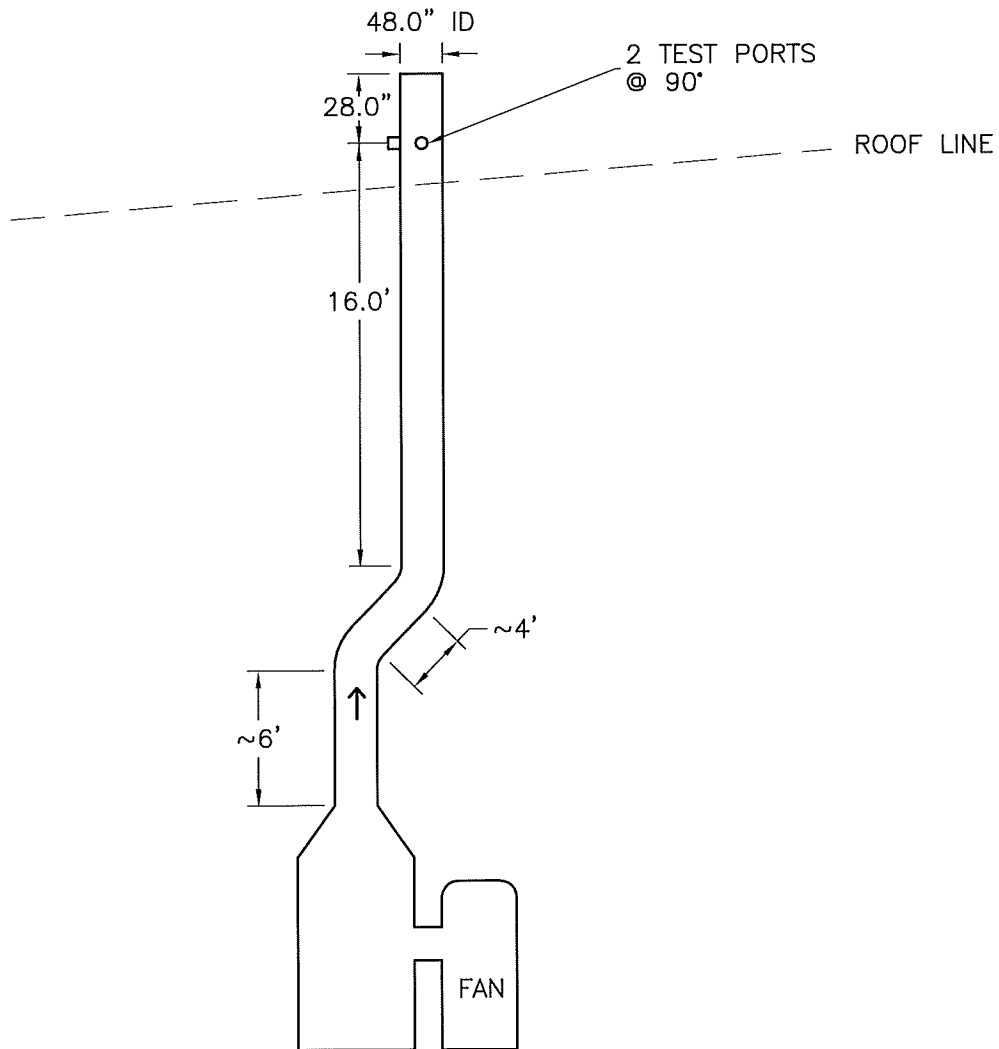
Elevation View

1. Emission Source Number- Line 6 SV 144 & Line 7 SV 151
2. Emission Unit Number- 313, 314, 315, 316 (at SV 144)
332, 333, 334, 335 (at SV 151)
3. Plant Equipment Number- 242-06-1; 261-06-1;
252-06-1; 262-06-1 (or 07-1 for the Line 7 equipment)
4. Stack Diameter- 16.0'
5. Stack Design Gas Temperature- 125 to 150°F
6. Stack Test Ports – 4 ea. 8" dia. Pipe nipple x 7" long
with 150 lb flange. Hanger hook 5' above.

Step III Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, MN

REVISED 01-03-00

US STEEL MINNESOTA ORE OPERATIONS
MOUNTAIN IRON, MINNESOTA
STEP 1 AGGLOMERATOR



TEST PORT LOCATIONS

COOLER SCRUBBER

SV: 105
EU: 228
CE: 089
GROUP: 21
298-03-8

NOT TO SCALE
2369_792

Appendix H

Project Participants and Contact Information

Project Participants and Contact Information

Minnesota Pollution Control Agency

Ladislaus Strzok – Pollution Control Specialist

U.S. Steel Corporation – Minntac

Chrissy Bartovich – Director Environmental Services

Stephani Campbell – Environmental Control Engineer

Cliff Erickson – Agglomerator Environmental Compliance Manager

Barr Engineering Company

Tim Russell – Vice President/Chemical Engineer

Tom Kuchinski – Supervisor/Senior Air Quality Technician

Dan Koschak – Senior Air Quality Technician

Dan Ellis – Senior Engineering Technician

Matthew Morrison – Air Quality Technician

Richard Skibsted – Air Quality Technician

CONTACT INFORMATION

MPCA Ladislaus Strzok Pollution Control Specialist Air Quality Compliance Tracking Coordinator Minnesota Pollution Control Agency 520 Lafayette Rd. N. Saint Paul, Minnesota 55155 (651) 757-2295 ladislaus.strzok@state.mn.us	U. S. Steel Corporation - Minntac Stephani Campbell Environmental Control Engineer U.S. Steel - Minntac P.O. Box 417 8819 Old Hwy 169 Mt. Iron, MN 55768 (218) 778-8684 P (218) 749-7360 F scampbell@uss.com	Barr Engineering Co. Tom Kuchinski Supervisor/Senior Air Quality Technician Barr Engineering Company 4700 W. 77 Street Minneapolis, MN 55435 (952) 832-2727 (952) 832-2601 tkuchinski@barr.com
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