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PORTSMOUTH LOCAL AIR AGENCY

June 19, 2006

Mr. Bob Brislin
Haverhill North Coke Company
2446 Gallia Pike
Franklin Furnace, Ohio 45629

Re: Compliance Test Report—HRSG bypass vent stack

Dear Bob:

Enclosed are four copies of the Compliance Test Report for the HRSG bypass vent stack. I previously e-mailed you a transmittal letter for sending one copy to Ms. Cindy Charles. The other 3 copies are for your records.

If you have any questions about these reports, please feel free to contact me at 865-220-8151.

Sincerely,

William C. Thomas
Project Manager

Enclosures (4)

cc: File

URS Corporation
1093 Commerce Park Drive, Suite 100
Oak Ridge, TN 37830-8029
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COMPLIANCE TEST REPORT
HAVERHILL NORTH COKE COMPANY
FACILITY ID 0773000182

Prepared for:

Haverhill North Coke Company
2446 Gallia Pike
Franklin Furnace, Ohio 45629

Prepared by:

URS Corporation
1093 Commerce Park Drive, Suite 100
Oak Ridge, Tennessee 37830
Doc. #0603081.MW97

June 2006

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1.0 INTRODUCTION

The Haverhill North Coke Company (HNCC) facility in Franklin Furnace, Ohio, operates under the facility's Permit to Install (PTI) 07-00511. Initial compliance tests are required by the PTI for the waste gas stack, heat recovery steam generator (HRSG) bypass vent stack, pushing hot car, and coke screening baghouse. The compliance tests for the waste gas stack (main stack), pushing hot car and coke screening baghouse were conducted in January 2006. Ohio Environmental Protection Agency (EPA) agreed in a letter dated October 18, 2005, to postpone testing of the HRSG bypass vent stack until the first scheduled maintenance event. Also, the Ohio Office of the Attorney General agreed in a letter dated July 28, 2005, to remove the requirement to test the vent stack for nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds.

The first scheduled maintenance of a HRSG occurred on HRSG 3 during the week of April 23, 2006. An Intent to Test Notification to perform the initial compliance tests on the HRSG bypass vent stack was submitted to Ohio EPA for review on March 22, 2006. The initial compliance test was conducted on HRSG 3 on April 28, 2006.

The emission limits from the permit are listed in Table 1-1 along with the measured values. Lead and sulfur dioxide (SO_2) test emissions demonstrated compliance. However, particulate matter (PM)/particulate matter less than 10 micrometers in diameter (PM_{10}) test emissions did not meet the emission limits. Mercury emission testing was performed in accordance with the Permit to Install testing requirements. There are no emission limits for mercury from the HRSG bypass vent stack. The mercury emission results are also presented in Table 1-1.

Personnel on-site during the tests included:

- Bob Brislin, Health and Safety Manager, HNCC;
- Cindy Charles, Ohio EPA, Portsmouth; and
- Walter Lin, URS Corporation (URS) test crew leader.

Table 1-1
Compliance Demonstration
HRSG Bypass Vent Stack (Emissions Unit ID: P901)
Haverhill North Coke Company

Pollutant	Emission Limit	Measured Value	Comply?
PM/PM_{10}	12.86 lb/hour	17.5 lb/hour	No
Lead	0.30 lb/hour	0.087 lb/hour	Yes
SO_2	1,267.2 lb/hour (3-hour average)	269 lb/hour	Yes
Mercury	No Existing Limit	0.00304 lb/hour	Not Applicable

Section 2.0 of this report summarizes the test methods used and the test results. The appendixes contain process data, calculations, analytical reports, field data sheets, calibration information, a copy of the Intent to Test Notification, a copy of the October 18, 2005, Director's letter and a copy of the July 28, 2005, Ohio Attorney General's letter..

2.0 TEST RESULTS

HNCC utilizes the Jewell-Thompson heat recovery oven to manufacture metallurgical coke. In coke production from both heat recovery and byproduct ovens, the volatile fraction of the coal is driven off in a reducing atmosphere. Coke is essentially the remaining carbon and ash. With byproduct ovens, the volatiles and combustion products are collected downstream of the oven chamber and refined in a chemical plant to produce coke oven gas and other products such as tar, ammonia, and light oils. In heat recovery ovens, all the coal volatiles are oxidized.

HRSGs recover heat from the oven waste gases. The cooled gases pass through a lime spray dryer/baghouse system prior to being exhausted from the main stack. The oven pushing/charging machine travels on rails between ovens during the production cycle. A traveling hood/baghouse system controls emissions from coal charging that escape the ovens. On the opposite side of the ovens from the pushing/charging machine, coke is pushed into a flat push hot car that travels on rails from the oven to the quench tower. A multicyclone captures and controls emissions from pushing the coke into the car and during travel to the quench tower. A baghouse controls particulate emissions from the coke screening and crushing facilities in the coke processing area.

2.1 Test Methodology

Currently 100 ovens at HNCC operate on a 48-hour coking cycle. The operating schedule is arranged such that half of the ovens are charged each day. For example, the 50 even-numbered ovens are charged one day and the 50 odd-numbered ovens are charged the next. The cycle is staggered further such that 25 ovens are charged during one production shift and the other 25 ovens are charged 12 hours later.

Test run 1 was conducted during the production activities associated with HRSG 3. Approximately 44 tons of coal were charged to each of the five ovens that vent through HRSG 3. Test runs 2 and 3 were conducted when production activities had been completed, approximately during the mid and late portions of the 12-hour production cycle.

The sampling methods used during the test are summarized in Table 2-1.

Table 2-1

Test Method Summary

Emission Unit	Pollutant	Test Method	Comments
HRSG Bypass Vent Stack	PM/PM_{10}/Lead/Mercury	EPA Method 5/29	
	SO_2	EPA Method 6C	
	Traverse Point Layout	EPA Method 1	
	Gas Flow Rate	EPA Method 2	HRSG bypass vent stack 3 had cyclonic flow
	Gas Molecular Weight	EPA Method 3	
	Moisture	EPA Method 4	

As part of the pre-test activities, measurements were made to determine whether cyclonic flow conditions existed. Although cyclonic flow was not expected, the measurements indicated an average yaw angle of 33.97 degrees. Since this exceeded the 20 degrees allowed by Method 1 procedures, an alternative approach to the Method 5/29 sampling was needed. A conference call was conducted on April 28, 2006, among URS, HNCC, and Mr. Todd Brown of the Ohio EPA.

During the conference call, URS suggested performing the sampling with modifications based on the "The Alignment Approach" in EPA Guideline Document EMC GD-008. The proposed modified procedure involved the following:

- Measure the yaw angle at each traverse point as in Method 1.
- Rotate the probe to the average yaw angle so that the probe nozzle points into the gas flow.
- Sample at all points with the probe rotated to the average yaw angle.
- Calculate the percent isokinetic sampling rate based on these measurements.
- Calculate the stack velocity and volumetric flow rate using the cosine of the average yaw angle.

Mr. Brown requested that URS use the procedure as described above and calculate the stack gas velocity from the pre-run velocity traverse at the individual yaw angles. Mr. Brown indicated that the proposed alternative approach would be validated if the pre-run stack gas velocity was within 10% of the stack gas velocity calculated from the test run conducted at the

average yaw angle. The results of these calculations are summarized in Table 2-2. Since the average difference for the two test runs was 7.8%, the approach used for the Method 5/29 samples is valid.

Table 2-2

Comparison of Gas Velocities at Individual and Average Yaw Angles

	Run 1	Run 2	Average
Average Vertical Stack Gas Velocity, ft/sec			
Pre-run Traverse at Individual Yaw Angles	51.6	65.7	
Test Run Traverse at Average Yaw Angle	58.4	63.3	
Absolute Difference of Velocities, % of Test Run Result	11.7	3.8	7.8

2.2 Test Results

The tests for lead, mercury, PM/PM_{10}, and SO_2 were performed on April 28, 2006. The results are summarized in Table 2-3.

As indicated in Table 2-3, test run 3 for PM/PM_{10}, lead, and mercury was not completed. Test run 3 was about 75% complete when an eyebolt holding the monorail for the Method 5/29 sampling train broke and the sampling train fell. The Inconel sampling probe was severely bent, the integrated quartz probe liner/nozzle was broken, and the impinger solutions were lost. Ms. Cindy Charles (the Ohio EPA representative witnessing the tests) indicated, since the emissions from the HRSG bypass vent stacks account for approximately 2% of the total site emissions and the extreme circumstances associated with the test run 3 accident, it would be appropriate to request the State accept the two successful test runs for an official compliance test. Accordingly, HNCC is requesting that the two successful test runs for lead and mercury be accepted as the official compliance test for these parameters.

HNCC will submit an Intent to Test Notification for demonstrating compliance with the PM/PM_{10} emission limits for the HRSG bypass vent stacks. The notification will be submitted 30 days in advance of the proposed test date. With the current schedule for performing maintenance on the HRSGs, the likely test date will be the third week of July.

Table 2-3

HRSG By-Pass Vent Stack Test Results

	Run 1	Run 2	Run 3	Average
Date	28-Apr-06	28-Apr-06	28-Apr-06	
Time	11:16-12:31	13:46-14:59	16:06-17:30	
Average Stack Temperature (°F)	1,807	1,831		1,819
Flue Gas Moisture (%)	14.9	9.6		12.3
CO_2 (%, dry basis)	10.38	9.74	9.91	
O_2 (%, dry basis)	6.50	6.62	6.65	
N_2 (%, dry basis)	83.12	83.64	83.44	
Sample Volume (dscf)	37.494	41.339	--	
Average Gas Velocity (ft/sec), measured	70.4	76.3	--	73.4
Average Gas Velocity (ft/sec), corrected for cyclonic flow	58.4	63.3	--	60.9
Avg Flow Rate (acfm)	222,933	241,616	--	232,274
Avg Flow Rate (dscfm)	43,535	49,616	--	46,575
Isokinetic Sampling Rate (%)	98.8	95.6	--	
PM/PM_{10}				
Total Particulate Loading (gr/dscf)	0.0607	0.0291	--	0.0449
Total Particulate Emissions (lb/hour)	22.7	12.4	--	17.5
Metals				
Lead Concentration (µg/dscf)	20.5	8.5	--	14.5
Lead Emissions (lb/hour)	0.118	0.056	--	0.087
Mercury Concentration (µg/dscf)	0.57	0.43	--	0.50
Mercury Emissions (lb/hour)	0.00326	0.00281	--	0.00304
SO_2				
SO_2 Concentration, (ppmv, dry basis)	626	544	578	583
SO_2 Emissions (lb/hour)	271	269	268	269

Notes:

1. Run 3 for PM/PM_{10}/Lead/Mercury was not completed due to critical sampling equipment failure.
2. Average SO_2 emission rate (lb/hour) for run 3 is calculated using the average stack gas flow rate for runs 1 and 2.

acfm = actual cubic feet per minute
CO_2 = Carbon Dioxide
dscf = dry standard cubic feet
dscfm = dry standard cubic feet per minute
N_2 = Nitrogen
O_2 = Oxygen
PM = Particulate Matter
PM_{10} = Particulate matter less than 10 microns
ppmv = parts per million by volume
SO_2 = Sulfur Dioxide

HNCC PUSHING REPORT

DATE: 04/28/06

TURN: MIDNIGHTS

CREW: (circle) (A) B C

OVEN	PREV TIME	PREV WEIGHT	DATE	CHG TIME	DATE	TONS GHG	OVEN INSP	DOOR/LINTEL DAMAGE	DOOR FIRE - PUSHER SIDE: DOOR OBS.	DOOR FIRE - PUSHER SIDE: DOOR FIRE	DOOR FIRE - PUSHER SIDE: Cor. Act. & Fire Out T.	DOOR FIRE - COKE SIDE: DOOR OBS.	DOOR FIRE - COKE SIDE: DOOR FIRE	DOOR FIRE - COKE SIDE: Cor. Act. & Fire Out T.
3 ✓	615am	46	4/26	5:43am	4-28-06	46	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
7 ✓	625	46	4/26	5:52	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
11 ✓	545	46	4/26	6:00	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
15 ✓	604	46	4/26	6:09	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
19 ✓	635	46	4/26	6:17	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
23 ✓	644	46	4/26	6:28	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
27 ✓	654	46	4/26	6:42	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
31 ✓	702	46	4/26	6:50	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
35 ✓	711	46	4/26	7:00	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
39 ✓	720	46	4/26	7:08	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
43 ✓	732	46	4/26	11:38	"	44	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
47 ✓	742	46	4/26	11:47	"	44	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
51 ✓	752	46	4/26	11:56	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
55 ✓	801	46	4/26	12:04pm	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
59 ✓	813	46	4/26	12:13pm	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
63 ✓	830	46	4/26	9:02	"	45	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
67 ✓	838	46	4/26	9:10	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
71 ✓	846	46	4/26	9:18	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
75 ✓	854	46	4/26	10:12	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
79 ✓	902	46	4/26	10:20	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
83 ✓	910	46	4/26	10:29	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
87 ✓	919	46	4/26	10:39	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
91 ✓	927	46	4/26	10:49	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
95 ✓	937	46	4/26	10:59	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	
99 ✓	946	46	4/26	11:09	"	"	Y // N	door // lintel	(Y) // N	Y // (N)		Y // N	Y // N	

Stack	1237	Draft
1		
2		
3		
4		
5		

	PCM	D/M	HOT CAR
Charged Fire Ext.	(YES) NO	YES-NO	YES-NO
Hydraulic Oil Spill	YES (NO)	YES-NO	YES-NO
Windows Good Condition.	(YES) NO	YES-NO	YES-NO
Doors Good Condition.	(YES) NO	YES-NO	YES-NO

Door fire correction step list

1) Tighten door
2) Place K-Wool
3) Open uptake
4) Check blocks
5) Verify up take setting
6) Raise draft
7) Close SF 50%
8) Reduce door holes
9) Open EVS

Appendix A

PROCESS DATA

Appendix B

CALCULATIONS

Project: HNCC
Project No.: 39400163
Source: Hot Vent Stack #3
Test Date: 4/28/2006
Test I.D.: Method 5/29

Parameters	Run # 1	Run # 2	Run # 3	Average
Sample Time	60	60	0	40
Vol. Sampled @ STP (ft3)	37.476	41.320	0.000	26.265
Moisture Content (% Vol.)	14.9	9.6	#DIV/0!	#DIV/0!
O2 (%)	6.5	6.6	0.0	4.4
CO2 (%)	10.4	9.7	0.0	6.7
Stack Gas Temperature (°F)	1807	1831	1789	1809
Stack Velocity (ft/min.)	4,219	4,572	#DIV/0!	#DIV/0!
Gas Flow Rate (ACFM)	268,381	290,881	#DIV/0!	#DIV/0!
Gas Flow Rate (DSCFM)	52,429	59,744	#DIV/0!	#DIV/0!
Percent Isokinetic	98.8	95.6	#DIV/0!	#DIV/0!
Particulate Conc. (Grains/DSCF)	0.0000	0.0000	#DIV/0!	#DIV/0!
Particulate Mass Rate (pounds/hr)	0.00	0.00	#DIV/0!	#DIV/0!

Note: Gas flow rate data have not been corrected for cyclonic flow.

STACK TEST CALCULATIONS

Project:	HNCC	Barom. Psr.:	29.45		Calculated
Project No:	39400163	Static Psr.:	0.43	Ps:	29.482
Source:	Hot Vent Stack #3	Delta H @:	1.643	As:	63.617
Run No.:	1	Gamma:	0.996	An:	0.000767
Date:	4/28/2006	Pitot Coef.:	0.84		
Sample Volume:	39.355	Stack Dia.:	108 ,in.		
Sample Time:	60	Nozzle Dia.:	0.375 ,in.		
O2 Conc.:	6.5	H2O Gain:	139.3 ,ml		
CO2 Conc.:	10.38	Part. Weight:	,g		

TRAVERSE POINT NUMBER	VELOCITY DELTA P Actual	Sq. Root	DELTA H	DRY GAS METER TEMPERATURE Inlet	Outlet	STACK TEMP.
1	0.20	0.44721	0.75	82		1569
2	0.30	0.54772	1.11	82		1691
3	0.30	0.54772	1.11	82		1704
4	0.38	0.61644	1.41	83		1707
5	0.38	0.61644	1.41	83		1708
6	0.38	0.61644	1.41	84		1708
7	0.18	0.42426	0.67	83		1600
8	0.30	0.54772	1.11	83		1698
9	0.37	0.60828	1.39	83		1746
10	0.40	0.63246	1.50	84		1750
11	0.42	0.64807	1.58	84		1753
12	0.42	0.64807	1.58	85		1798
13	0.27	0.51962	1.01	86		1750
14	0.33	0.57446	1.22	87		1863
15	0.38	0.61644	1.41	87		1875
16	0.44	0.66332	1.65	87		1898
17	0.44	0.66332	1.65	87		1920
18	0.50	0.70711	1.79	88		1915
19	0.21	0.45826	0.79	86		1898
20	0.30	0.54772	1.11	87		1932
21	0.36	0.60000	1.35	87		1964
22	0.40	0.63246	1.50	87		1964
23	0.46	0.67823	1.72	88		1971
24	0.46	0.67823	1.72	89		1977
AVERAGE	0.3827778	0.593334	1.33125	85.16667		1806.625

Project: HNCC
Project No: 39400163
Source: Hot Vent Stack #3
Run No.: 1

Stack Sampling Calculations

Volume of Water Collected

Vwstd = (Vl0)(0.04707)

Vwstd = 6.56 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((17.64) (Vm)(Pb + DeltaH/13.6)(gamma))/Tm

Vmstd = 37.476 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)

Bwo = 0.1489

Molecular Weight of the Dry Gas Stream

Md = (.44)(%CO2) + (.32)(%O2) + (.28)(%CO +%N2)

Md = 29.9

Molecular Weight of Stack Gas

Ms = (Md(1-Bwo) + 18(bwo)

Ms = 28.1

Velocity of Stack Gas

Vs = 174 Cp (DeltaP sq.rt.)((Ts+459.6) X 29.92 X 28.96/Ps/Ms)^.5

Vs = 4,218.7 ft/min

Total Flow of Stack Gas

Qa = As X Vs

Qa = 268,381.35 ACFM

Qs = Qa X 528/Ts X Ps/29.92

Qs = 61,602.21 SCFM

Qstd = Qs(1 - Bwo)

Qstd = 52,429.17 DSCFM

Vsstd = Qstd/As

Vsstd = 824.14 ft/min

Not adjusted for cyclonic flow

Percent Isokinetic

Is = Vmstd/(An X Time X Vsstd)

Is = 0.9881

Particulate Concentration

Cs = (15.43)(Mn)/Vmstd

Cs = 0.0000

Particulate Mass Rate

Pmr = (Mn)(Qstd)(60)/(Vmstd)(453.6)

Pmr = 0.00

STACK TEST CALCULATIONS

Project:	HNCC	Barom. Psr.:	29.45		Calculated
Project No:	39400163	Static Psr.:	0.43	Ps:	29.482
Source:	Hot Vent Stack #3	Delta H @:	1.643	As:	63.617
Run No.:	2	Gamma:	0.996	An:	0.000767
Date:	4/28/2006	Pitot Coef.:	0.84		
Sample Volume:	43.397	Stack Dia.:	108 ,in.		
Sample Time:	60	Nozzle Dia.:	0.375 ,in.		
O2 Conc.:	6.62	H2O Gain:	92.9 ,ml		
CO2 Conc.:	9.74	Part. Weight:	,g		

TRAVERSE POINT NUMBER	VELOCITY DELTA P Actual	Sq. Root	DELTA H	DRY GAS METER TEMPERATURE Inlet	Outlet	STACK TEMP.
1	0.18	0.42426	0.68	89		1668
2	0.29	0.53852	1.10	89		1834
3	0.34	0.58310	1.29	89		1875
4	0.40	0.63246	1.50	90		1880
5	0.45	0.67082	1.70	90		1880
6	0.48	0.69282	1.80	90		1889
7	0.39	0.62450	1.49	88		1879
8	0.42	0.64807	1.65	89		1877
9	0.46	0.67823	1.72	90		1872
10	0.48	0.69282	1.80	90		1876
11	0.48	0.69282	1.80	89		1877
12	0.44	0.66332	1.65	88		1879
13	0.37	0.60828	1.30	84		1763
14	0.44	0.66332	1.65	84		1852
15	0.45	0.67082	1.70	84		1877
16	0.50	0.70711	1.89	83		1878
17	0.51	0.71414	1.90	83		1873
18	0.49	0.70000	1.85	84		1869
19	0.23	0.47958	0.86	80		1322
20	0.38	0.61644	1.35	80		1794
21	0.46	0.67823	1.72	80		1852
22	0.50	0.70711	1.89	81		1855
23	0.51	0.71414	1.90	80		1858
24	0.49	0.70000	1.85	80		1856
AVERAGE	0.4225	0.645872	1.585	85.58333		1830.625

Project: HNCC
Project No: 39400163
Source: Hot Vent Stack #3
Run No.: 2

Stack Sampling Calculations

Volume of Water Collected

Vwstd = (VI0)(0.04707)

Vwstd = 4.37 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((17.64) (Vm)(Pb + DeltaH/13.6)(gamma))/Tm

Vmstd = 41.320 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)

Bwo = 0.0957

Molecular Weight of the Dry Gas Stream

Md = (.44)(%CO2) + (.32)(%O2) + (.28)(%CO +%N2)

Md = 29.8

Molecular Weight of Stack Gas

Ms = (Md(1-Bwo) + 18(bwo)

Ms = 28.7

Velocity of Stack Gas

Vs = 174 Cp (DeltaP sq.rt.)((Ts+459.6) X 29.92 X 28.96/Ps/Ms)^.5

Vs = 4,572.4 ft/min

Total Flow of Stack Gas

Qa = As X Vs

Qa = 290,880.53 ACFM

Qs = Qa X 528/Ts X Ps/29.92

Qs = 66,066.96 SCFM

Qstd = Qs(1 - Bwo)

Qstd = 59,744.30 DSCFM

Vsstd = Qstd/As

Vsstd = 939.12 ft/min

Not adjusted for cyclonic flow

Percent Isokinetic

Is = Vmstd/(An X Time X Vsstd)

Is = 0.9561

Particulate Concentration

Cs = (15.43)(Mn)/Vmstd

Cs = 0.0000

Particulate Mass Rate

Pmr = (Mn)(Qstd)(60)/(Vmstd)(453.6)

Pmr = 0.00

STACK TEST CALCULATIONS

Project:	HNCC	Barom. Psr.:	29.45		Calculated
Project No:	39400163	Static Psr.:	0.43	Ps:	29.482
Source:	Hot Vent Stack #3	Delta H @:	1.643	As:	63.617
Run No.:	3	Gamma:	0.996	An:	0.000767
Date:	4/28/2006	Pitot Coef.:	0.84		
Sample Volume:		Stack Dia.:	108 ,in.		
Sample Time:		Nozzle Dia.:	0.375 ,in.		
O2 Conc.:		H2O Gain:	,ml		
CO2 Conc.:		Part. Weight:	,g		

TRAVERSE POINT NUMBER	VELOCITY DELTA P Actual	Sq. Root	DELTA H	DRY GAS METER TEMPERATURE Inlet	Outlet	STACK TEMP.
1	0.23	0.47958	0.86	76		1521
2	0.33	0.57446	1.25	76		1766
3	0.40	0.63246	1.50	77		1827
4	0.43	0.65574	1.61	78		1842
5	0.45	0.67082	1.70	79		1841
6	0.48	0.69282	1.80	80		1842
7	0.37	0.60828	1.40	79		1733
8	0.36	0.60000	1.35	81		1772
9	0.40	0.63246	1.50	81		1842
10	0.46	0.67823	1.71	81		1841
11	0.48	0.69282	1.80	82		1839
12	0.46	0.67823	1.71	82		1839
13	0.20	0.44721	0.75	82		1650
14	0.29	0.53852	1.09	83		1776
15	0.34	0.58310	1.28	83		1815
16	0.37	0.60828	1.40	83		1816
17	0.40	0.63246	1.50	83		1817
18	0.44	0.66332	1.65	83		1819
19		0.00000				
20		0.00000				
21		0.00000				
22		0.00000				
23		0.00000				
24		0.00000				
AVERAGE	0.3827778	0.461199	1.4366667	80.5		1788.778

Project: HNCC
Project No: 39400163
Source: Hot Vent Stack #3
Run No.: 3

Stack Sampling Calculations

Volume of Water Collected

Vwstd = (Vl0)(0.04707)

Vwstd = 0.00 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((17.64) (Vm)(Pb + DeltaH/13.6)(gamma))/Tm

Vmstd = 0.000 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)

Bwo = #DIV/0!

Molecular Weight of the Dry Gas Stream

Md = (.44)(%CO2) + (.32)(%O2) + (.28)(%CO +%N2)

Md = 28.0

Molecular Weight of Stack Gas

Ms = (Md(1-Bwo) + 18(bwo)

Ms = #DIV/0!

Velocity of Stack Gas

Vs = 174 Cp (DeltaP sq.rt.)((Ts+459.6) X 29.92 X 28.96/Ps/Ms)^.5

Vs = #DIV/0! ft/min

Total Flow of Stack Gas

Qa = As X Vs

Qa = #DIV/0! ACFM

Qs = Qa X 528/Ts X Ps/29.92

Qs = #DIV/0! SCFM

Qstd = Qs(1 - Bwo)

Qstd = #DIV/0! DSCFM

Vsstd = Qstd/As

Vsstd = #DIV/0! ft/min

Percent Isokinetic

Is = Vmstd/(An X Time X Vsstd)

Is = #DIV/0!

Particulate Concentration

Cs = (15.43)(Mn)/Vmstd

Cs = #DIV/0!

Particulate Mass Rate

Pmr = (Mn)(Qstd)(60)/(Vmstd)(453.6)

Pmr = #DIV/0!

Haverhill North Coke Company--Lead and Mercury Test Results

Sample ID	Analytical Results (µg/sample)			Metered Volume (dscf)	Metal Concentration, µg/dscf		
	Mercury (Hg)	Lead (Pb)			Hg	Pb	
HNCC-STK-11-M29-PNR/FILT	< 0.20	766					
HNCC-STK-11-M29-NI	11.2	< 1.0					
HNCC-STK-11-M29-EIR	3.1						
HNCC-STK-11-M29-PERM	< 0.14						
HNCC-STK-11-M29-HCLRNS	6.6						
TOTAL	21.2	767.0		37.494	0.57	20.46	
HNCC-STK-12-M29-PNR/FILT	< 0.20	352.0					
HNCC-STK-12-M29-NI	7.4	< 1.0					
HNCC-STK-12-M29-EIR	1.4						
HNCC-STK-12-M29-PERM	0.31						
HNCC-STK-12-M29-HCLRNS	8.4						
TOTAL	17.7	353.0		41.339	0.43	8.54	
HNCC-STK-13-M29-PNR/FILT							
HNCC-STK-13-M29-NI							
HNCC-STK-13-M29-EIR							
HNCC-STK-13-M29-PERM							
HNCC-STK-13-M29-HCLRNS							
TOTAL					#DIV/0!	#DIV/0!	

Haverhill North Coke Company
Preliminary Complaince Test Data

Location	Hot Vent Stack	Hot Vent Stack	Averages
Parameter	PM	PM	
Run Designation	Run 1	Run 2	
Date	28-Apr-06	28-Apr-06	
Time Start	1116	1346	
Time Stop	1231	1459	
	11:16-12:31	13:46-14:59	
Duct Diameter (ft)	9	9	
Pitot Tube Correction Factor	0.84	0.84	
Nozzle Diameter (inches)	0.375	0.375	
DGMCF	0.996	0.996	
Standard Temperature (°F)	68	68	
Barometric Pressure Measured (" Hg)	29.45	29.45	
Barometric Pressure (" Hg)	29.45	29.45	
Average Stack Temperature (°F)	1,807	1,831	1,819
Average DGM Temp (°F)	85	86	
Average Delta H (in wc)	1.331	1.585	
Condensed Water (g)	139.3	92.9	
Test Duration (minutes)	60	60	
Static Pressure (in wc)	0.43	0.43	
% CO2, approximate	10.38	9.74	
% O2, approximate	6.50	6.62	
% N2	83.12	83.64	
Meter Volume (acf)	39.355	43.397	
Average square root of delta p, measured	0.593	0.646	
Absolute Stack Pressure (in Hg)	29.48	29.48	
Absolute Stack Temperature (°R)	2,267	2,291	2,279
Flue Gas Moisture (%)	14.9	9.6	12.3
Moisture used in Calculation	14.9	9.6	12.3
Gas Molecular Weight (Wet) (g/g-mole)	28.14	28.69	
Corrected Volume of Gas sampled (acf)	39.198	43.223	
Volume at Meter (dscf)	37.494	41.339	
Average Gas Velocity (f/sec), measured	70.4	76.3	73.4
Average Gas Velocity (f/sec), cyclonic corrected	58.4	63.3	60.9
Avg Flow Rate (acfh)	13,375,972	14,496,937	13,936,454
Avg Flow Rate (acfm)	222,933	241,616	232,274
Avg Flow Rate (scfh)	3,070,427	3,292,876	3,181,651
Avg Flow Rate (scfm)	51,174	54,881	53,028
Avg Flow Rate (dscfh)	2,612,114	2,976,935	2,794,524
Avg Flow Rate (dscfm)	43,535	49,616	46,575
Isokinetic Sampling Rate (%)	98.8	95.6	
Filter Weight Gain (mg)	116.0	54.8	
PNR Weight Gain (mg)	31.5	23.2	
Total Particulate Loading (gr/dscf)	0.0607	0.0291	0.0449
Total Particulate Loading (mg/dscm)	138.9	66.6	102.8
Total Particulate Emission (lbs/hr)	22.7	12.4	17.5
Lead (Pb) Gain (µg)	767.0	353.0	560.0
Mercury (Hg) Gain (µg)	21.2	17.7	19.5
Pb Loading (µg/dscf)	20.5	8.5	14.5
Hg Loading (µg/dscf)	0.57	0.43	0.50
Pb Emission (lbs/hr)	1.18E-01	5.60E-02	8.69E-02
Hg Emission (lbs/hr)	3.26E-03	2.81E-03	3.04E-03

	Run 1	Run 2	Run 3	Average
Avg. Sulfur Dioxide, ppm	626	544	578	583
Avg. Sulfur Dioxide, (lbs/hr)	271	269	268	269

STACK TEST CALCULATIONS

Project:	HNCC	Barom. Psr.:	29.45		Calculated
Project No:	39400163	Static Psr.:	0.43	Ps:	29.482
Source:	Hot Vent Stack #3	Delta H @:	1.643	As:	63.617
Run No.:	1	Gamma:	0.996	An:	0.000767
Date:	4/28/2006	Pitot Coef.:	0.84		
Sample Volume:	39.355	Stack Dia.:	108 ,in.		
Sample Time:	60	Nozzle Dia.:	0.375 ,in.		
O2 Conc.:	6.5	H2O Gain:	139.3 ,ml		
CO2 Conc.:	10.38	Part. Weight:	,g		

PRE-TEST TRAVERSE AT INDIVIDUAL YAW ANGLES--RUN 1

TRAVERSE POINT NUMBER	VELOCITY DELTA P Actual	Sq. Root	Gas velocity, ft/min	Yaw Angle	Vertical Velocity Component	STACK TEMP.
1	0.23	0.47958	3316	28.7	2908	1683
2	0.29	0.53852	3749	35.1	3067	1713
3	0.43	0.65574	4576	35	3748	1723
4	0.45	0.67082	4690	26.7	4190	1732
5	0.42	0.64807	4533	32.9	3806	1734
6	0.40	0.63246	4430	38	3491	1740
7	0.10	0.31623	2193	35	1796	1696
8	0.30	0.54772	3796	28.6	3332	1693
9	0.28	0.52915	3700	27.5	3282	1732
10	0.26	0.50990	3573	27.5	3169	1741
11	0.23	0.47958	3363	38.7	2625	1745
12	0.30	0.54772	3843	44.4	2746	1747
13	0.12	0.34641	2406	39.7	1851	1703
14	0.27	0.51962	3615	35.7	2936	1710
15	0.38	0.61644	4296	27.4	3814	1718
16	0.29	0.53852	3758	32.7	3163	1724
17	0.20	0.44721	3126	40.3	2384	1730
18	0.26	0.50990	3568	40.5	2713	1735
19	0.21	0.45826	3159	30.7	2716	1670
20	0.24	0.48990	3400	25.5	3069	1700
21	0.35	0.59161	4127	28.1	3641	1722
22	0.40	0.63246	4420	35.4	3603	1730
23	0.45	0.67082	4689	39.9	3598	1731
24	0.25	0.50000	3498	41.7	2611	1734
AVERAGE	0.42	0.537				1720

Pre-run Average Vertical Velocity =	3094	ft/min
	51.57	ft/sec
Test Run Average Vertical Velocity =	58.4	ft/sec
	11.7%	difference

STACK TEST CALCULATIONS

Project:	HNCC	Barom. Psr.:	29.45		Calculated
Project No:	39400163	Static Psr.:	0.43	Ps:	29.482
Source:	Hot Vent Stack #3	Delta H @:	1.643	As:	63.617
Run No.:	2	Gamma:	0.996	An:	0.000767
Date:	4/28/2006	Pitot Coef.:	0.84		
Sample Volume:	43.397	Stack Dia.:	108 ,in.		
Sample Time:	60	Nozzle Dia.:	0.375 ,in.		
O2 Conc.:	6.62	H2O Gain:	92.9 ,ml		
CO2 Conc.:	9.74	Part. Weight:	,g		

PRE-TEST TRAVERSE AT INDIVIDUAL YAW ANGLES--RUN 2

TRAVERSE POINT NUMBER	VELOCITY DELTA P Actual	Sq. Root	Gas velocity, ft/min	Yaw Angle	Vertical Velocity Component	STACK TEMP.
1	0.24	0.48990	3503	28.7	3072	1832
2	0.37	0.60828	4394	35.1	3595	1880
3	0.47	0.68557	4990	35	4087	1915
4	0.50	0.70711	5158	26.7	4608	1926
5	0.46	0.67823	4956	32.9	4161	1934
6	0.42	0.64807	4741	38	3736	1939
7	0.38	0.61644	4496	35	3683	1925
8	0.40	0.63246	4622	28.6	4058	1935
9	0.48	0.69282	5067	27.5	4494	1938
10	0.49	0.70000	5120	27.5	4542	1939
11	0.47	0.68557	5012	38.7	3911	1936
12	0.40	0.63246	4626	44.4	3305	1939
13	0.30	0.54772	3961	39.7	3048	1885
14	0.40	0.63246	4593	35.7	3730	1905
15	0.42	0.64807	4720	27.4	4190	1918
16	0.47	0.68557	4996	32.7	4204	1921
17	0.49	0.70000	5105	40.3	3894	1925
18	0.49	0.70000	5108	40.5	3884	1927
19	0.38	0.61644	4469	30.7	3842	1896
20	0.42	0.64807	4710	25.5	4251	1908
21	0.46	0.67823	4930	28.1	4349	1909
22	0.49	0.70000	5094	35.4	4152	1914
23	0.50	0.70711	5148	39.9	3949	1916
24	0.50	0.70711	5148	41.7	3843	1916
AVERAGE	0.4333333	0.656153				1915.75

Pre-run Average Vertical Velocity =	3941	ft/min
	65.69	ft/sec
Test Run Average Vertical Velocity =	63.3	ft/sec
	3.8%	difference

Appendix C

ANALYTICAL REPORT

SEVERN TRENT STL

STL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921

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ANALYTICAL REPORT

PROJECT NO. 39400163.01

SUN COKE HAVERHILL

Lot #: H6E030192

Bill Thomas

URS Corporation
1093 Commerce Park Dr
Suite 100
Oak Ridge, TN 37830

SEVERN TRENT LABORATORIES, INC.

Kevin S. Woodcock
Project Manager

received 5/31/06 WCT

May 19, 2006

METHODS SUMMARY

H6E030192

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Inductively Coupled Plasma (ICP) Metals	SW846 6010B	
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A	
Particulate Emissions	CFR60A 5	

References:

CFR60A "Test Methods", 40 CFR, Part 60, Appendix A, July 1, 1993.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

H6E030192

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
H4LL5	001	HNCC-HV-1RB-ACE	04/26/06	
H4LMM	002	HNCC-HV-1RB-FILTER	04/26/06	
H4LMN	003	HNCC-HV-1RB-ACE/FILT/NA	04/26/06	
H4LMT	004	HNCC-HV-1RB-NP	04/26/06	
H4LMX	005	HNCC-HV-1RB-PERM/WATER	04/26/06	
H4LM2	006	HNCC-HV-1RB-HCL	04/26/06	
H4LM7	007	HNCC-HV-11-M29-PNR-ACE	04/28/06	
H4LND	008	HNCC-HV-11-M29-FILT	04/28/06	
H4LNE	009	HNCC-HV-11-M29-PNR-ACE/FILT/NA	04/28/06	
H4LNN	010	HNCC-HV-11-M29-NI	04/28/06	
H4LNT	011	HNCC-HV-11-M29-EIR	04/28/06	
H4LN2	012	HNCC-HV-11-M29-PERM	04/28/06	
H4LN5	013	HNCC-HV-11-M29-HCLRNS	04/28/06	
H4LPA	014	HNCC-HV-12-M29-PNR-ACE	04/28/06	
H4LPF	015	HNCC-HV-12-M29-FILT	04/28/06	
H4LPH	016	HNCC-HV-12-M29-PNR-ACE/FILT/NA	04/28/06	
H4LPM	017	HNCC-HV-12-M29-NI	04/28/06	
H4LPP	018	HNCC-HV-12-M29-EIR	04/28/06	
H4LPV	019	HNCC-HV-12-M29-PERM	04/28/06	
H4LPW	020	HNCC-HV-12-M29-HCLRNS	04/28/06	
H4LP4	021	A-5409 MEDIA CHECK M5	04/26/06	
H4LP8	022	A-5410 MEDIA CHECK M29	04/26/06	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H6E030192

The results reported herein are applicable to the samples submitted for analysis only.

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The original chain of custody documentation is included with this report.

Sample Receipt

The chain of custody did not list a date/time of collection for the samples. Dates shown in this report were taken from sample containers.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Metals

Multi-Metals Train Preparation and Analysis

These stack gas samples were prepared and analyzed using STL Knoxville standard operating procedure KNOX-MT-0006 which is based on EPA SW-846 Method 0060, "Determination of Metals in Stack Emissions" and Method 29, "Determination of Metals Emissions from Stationary Sources". SW-846 Methods 6010B and 7470A as incorporated in STL Knoxville standard operating procedures KNOX-MT-0007 and KNOX-MT-0009 were used to perform the final instrument analysis.

Acid digestion was performed on the front half particulate filter and the acetone and nitric acid probe rinse fractions separately using HNO_3 and HF. After digestion, the HF was sequestered using H_3BO_3 followed by another heating cycle. These digestates were combined, adjusted to final volume and analyzed by ICP. A portion of the ICP digestate was prepared for CVAA analysis in order to determine the particle-bound mercury. Results were calculated using the following equations:

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PROJECT NARRATIVE
H6E030192

$$ICPAnalyte,\ \mu g = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Final\ Volume \\ ICP\ Digestate,\ L \end{pmatrix}$$

$$Hg,\ ug = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Final\ Volume \\ ICP\ Digestate,\ L \end{pmatrix} \times \begin{pmatrix} \dfrac{Final\ Volume\ Hg\ Digestate,\ mL}{Volume\ ICP\ Digestate\ Used,\ mL} \end{pmatrix}$$

The 5%HNO_3/10%H_2O_2 impinger samples were reduced in volume to 100 mL. A 20 milliliter portion of the concentrated sample was removed and processed for mercury. The remaining 80 mL of concentrated sample was digested using HNO_3 and H_2O_2, adjusted to a final volume of 80 mL, and analyzed by ICP. Results were calculated using the following equations:

$$ICPAnalyte,\ \mu g = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Final\ Volume \\ Concentrated \\ Sample,\ L \end{pmatrix} \times \begin{pmatrix} \dfrac{Final\ Volume\ ICP\ Digestate,\ mL}{Volume\ Conc.\ Sample\ Digested,\ mL} \end{pmatrix}$$

$$Hg,\ \mu g = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Final\ Volume \\ Concentrated \\ Sample,\ L \end{pmatrix} \times \begin{pmatrix} \dfrac{Final\ Volume\ Hg\ Digestate,\ mL}{Volume\ Conc.\ Sample\ Digested,\ mL} \end{pmatrix}$$

For the 0.1N HNO_3 rinse samples (empty impingers), a 2.5 milliliter portion of the sample as received was removed and processed for mercury.

The 4% $KMnO_4$/10%H_2SO_4 impinger samples were filtered to remove MnO_2, followed by removal of a 25 mL portion of filtrate for mercury processing. The filtered MnO_2 residue was digested in HCl, combined with the HCl rinse sample and analyzed for mercury.

Results for the 0.1N HNO_3 rinse samples and the $KMnO_4$ filtrate were calculated using the following equation:

PROJECT NARRATIVE
H6E030192

$$Hg,\ ug = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Total \\ Sample \\ Volume,\ L \end{pmatrix} \times \left(\frac{Final\ Volume\ Hg\ Digestate,\ mL}{Volume\ Sample\ Digested,\ mL} \right)$$

Results for the combined MnO_2 residue HCl digestates and HCl rinse samples were calculated as follows:

$$Hg,\ ug = \begin{pmatrix} Raw\ Sample \\ Concentration,\ \mu g/L \end{pmatrix} \times \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Total\ Sample\ Volume,\ L \\ + \\ MnO_2\ HCl\ Volume,\ L \end{pmatrix} \times \left(\frac{Final\ Volume\ Hg\ Digestate,\ mL}{Volume\ Sample\ Digested,\ mL} \right)$$

Please note that the dilution factor reported on the mercury sample result form is actually the combination of preparation factors (not just a dilution factor) required by the method to convert the reporting limits and method detection limits in concentration units from ug/L to a total ug unit:

$$Hg\ Dilution\ Factor = \begin{pmatrix} Bench \\ Dilution \\ Factor \end{pmatrix} \times \begin{pmatrix} Total \\ Sample \\ Volume,\ L \end{pmatrix} \times \left(\frac{Final\ Volume\ Hg\ Digestate,\ mL}{Volume\ Sample\ Digested,\ mL} \right)$$

Note: The $Total\ Sample\ Volume,\ L$ for the 5%HNO_3/10%H_2O_2 impinger samples is the final volume of the concentrated sample. The $Total\ Sample\ Volume,\ L$ for the combined MnO_2 residue HCl digestates and HCl rinse samples is equal to the total sample volume plus the MnO_2 HCl volume.

The post digestion spike/post digestion spike duplicate recoveries for sample HNCC-HV-11-M29-PNR-ACE/FILT/NA were outside control limits for lead. However, the laboratory control sample showed acceptable results indicating that the analysis was in control. The post digestion spike/post digestion spike duplicate results are, therefore, attributed to matrix effects.

The matrix spike/matrix spike duplicate recoveries for sample HNCC-HV-11-M29-NI were outside control limits for mercury because the native analyte concentration in the

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PROJECT NARRATIVE
H6E030192

sample was at least four times greater than the spike level. The laboratory control samples showed acceptable results indicating that the analysis was in control.

Wet Chemistry

The measurement of the mass of particulate matter trapped by the particulate filter and probe rinse derived from an M-5 sampling train was performed using SOP number KNOX-WC-0006 (based on EPA Methods 0050 and 5). Microfiber filters, Petri dishes, and 150 mL beakers are carefully inspected and tare weighed to constant weight. After sample collection, the filters are dried, and then carefully weighed to constant weight to determine the mass of particulate matter trapped on the filters. The acetone probe rinse solution is evaporated to dryness, and then weighed to constant weight to determine the total particulate mass collected in the rinse. The total particulate mass collected by an M-5 train is the sum of the particulate filter and the acetone probe rinse residue weights.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. #05-043-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906 (SDWA, expires 6/24/05), Hawaii DOH, Illinois EPA Cert. #000687, Indiana DOH Cert. #C-TN-02, Iowa DNR Cert. #375, Kansas DHE Cert. #E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Ohio EPA VAP Cert. #CL0059, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. #68-00576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. # QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, West Virginia DEP Cert. #345, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

QC DATA ASSOCIATION SUMMARY

H6E030192

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	AA	CFR60A 5		6130421	
002	AA	CFR60A 5		6130421	
003	AA	SW846 7470A		6135322	
	AA	SW846 6010B		6135091	
004	AA	SW846 7470A		6135324	
	AA	SW846 6010B		6135095	
005	AA	SW846 7470A		6135324	
006	AA	SW846 7470A		6135324	
007	AA	CFR60A 5		6130421	
008	AA	CFR60A 5		6130421	
009	AA	SW846 7470A		6135322	
	AA	SW846 6010B		6135091	
010	AA	SW846 7470A		6135324	6135170
	AA	SW846 6010B		6135095	
011	AA	SW846 7470A		6135324	6135173
012	AA	SW846 7470A		6135324	6135174
013	AA	SW846 7470A		6135324	6135175
014	AA	CFR60A 5		6130421	
015	AA	CFR60A 5		6130421	
016	AA	SW846 7470A		6135322	
	AA	SW846 6010B		6135091	
017	AA	SW846 7470A		6135324	
	AA	SW846 6010B		6135095	
018	AA	SW846 7470A		6135324	

(Continued on next page)

QC DATA ASSOCIATION SUMMARY

H6E030192

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
019	AA	SW846 7470A		6135324	
020	AA	SW846 7470A		6135324	
021	AA	CFR60A 5		6130421	
022	AA	SW846 7470A		6135322	
	AA	SW846 6010B		6135091	

Sample Data Summary

URS Corporation

Client Sample ID: HNCC-HV-1RB-ACE/FILT/NA

TOTAL Metals

Lot-Sample #...: H6E030192-003 **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135091						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H4LMN1AA
		Dilution Factor: 1		Analysis Time..: 17:27	MDL.....: 0.37	
Prep Batch #...: 6135322						
Mercury	ND	0.20	ug	SW846 7470A	05/17/06	H4LMN1AC
		Dilution Factor: 1		Analysis Time..: 14:47	MDL.....: 0.060	

URS Corporation

Client Sample ID: HNCC-HV-1RB-NP

TOTAL Metals

Lot-Sample #...: H6E030192-004 **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135095						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H4LMT1AA
		Dilution Factor: 1		Analysis Time..: 15:57	MDL.....: 0.37	
Prep Batch #...: 6135324						
Mercury	ND	0.40	ug	SW846 7470A	05/17/06	H4LMT1AC
		Dilution Factor: 2		Analysis Time..: 13:58	MDL.....: 0.12	

URS Corporation

Client Sample ID: HNCC-HV-1RB-PERM/WATER

TOTAL Metals

Lot-Sample #...: H6E030192-005 **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	ND	0.054	ug	SW846 7470A	05/17/06	H4LMX1AA
		Dilution Factor: 0.27		Analysis Time..: 14:04	MDL.....: 0.016	

URS Corporation

Client Sample ID: HNCC-HV-1RB-HCL

TOTAL Metals

Lot-Sample #...: H6E030192-006 Matrix.....: AA
Date Sampled...: 04/26/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	ND	0.15	ug	SW846 7470A	05/17/06	H4LM21AA
		Dilution Factor: 0.75		Analysis Time..: 14:07	MDL.....: 0.045	

URS Corporation

Client Sample ID: HNCC-HV-11-M29-PNR-ACE/FILT/NA

TOTAL Metals

Lot-Sample #...: H6E030192-009 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135091						
Lead	**766**	**1.0**	**ug**	**SW846 6010B**	**05/15-05/16/06**	**H4LNE1AA**
		Dilution Factor: 1		Analysis Time..: 17:53	MDL.....: 0.37	
Prep Batch #...: 6135322						
Mercury	ND	0.20	ug	SW846 7470A	05/17/06	H4LNE1AC
		Dilution Factor: 1		Analysis Time..: 14:49	MDL.....: 0.060	

URS Corporation

Client Sample ID: HNCC-HV-11-M29-NI

TOTAL Metals

Lot-Sample #...: H6E030192-010
Date Sampled...: 04/28/06 Date Received..: 05/02/06
Matrix.....: AA

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135095						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H4LNN1AA
		Dilution Factor: 1		Analysis Time..: 16:04	MDL.....: 0.37	
Prep Batch #...: 6135324						
Mercury	11.2	1.2	ug	SW846 7470A	05/17/06	H4LNN1AC
		Dilution Factor: 6		Analysis Time..: 17:22	MDL.....: 0.36	

URS Corporation

Client Sample ID: HNCC-HV-11-M29-EIR

TOTAL Metals

Lot-Sample #...: H6E030192-011 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	3.1	0.40	ug	SW846 7470A	05/17/06	H4LNT1AA
		Dilution Factor: 2		Analysis Time..: 14:15	MDL.....: 0.12	

URS Corporation

Client Sample ID: HNCC-HV-11-M29-PERM

TOTAL Metals

Lot-Sample #...: H6E030192-012 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	ND	0.14	ug	SW846 7470A	05/17/06	H4LN21AA
		Dilution Factor: 0.7		Analysis Time..: 14:21	MDL.....: 0.042	

URS Corporation

Client Sample ID: HNCC-HV-11-M29-HCLRNS

TOTAL Metals

Lot-Sample #...: H6E030192-013 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	6.6	0.34	ug	SW846 7470A	05/17/06	H4LN51AA
		Dilution Factor: 1.68		Analysis Time..: 14:31	MDL.....: 0.10	

URS Corporation

Client Sample ID: HNCC-HV-12-M29-PNR-ACE/FILT/NA

TOTAL Metals

Lot-Sample #...: H6E030192-016 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135091						
Lead	**352**	**1.0**	**ug**	**SW846 6010B**	**05/15-05/16/06**	**H4LPH1AA**
		Dilution Factor: 1		Analysis Time..: 18:12	MDL.....: 0.37	
Prep Batch #...: 6135322						
Mercury	ND	0.20	ug	SW846 7470A	05/17/06	H4LPH1AC
		Dilution Factor: 1		Analysis Time..: 15:00	MDL.....: 0.060	

URS Corporation

Client Sample ID: HNCC-HV-12-M29-NI

TOTAL Metals

Lot-Sample #...: H6E030192-017 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135095						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H4LPM1AA
		Dilution Factor: 1		Analysis Time..: 16:42	MDL.....: 0.37	
Prep Batch #...: 6135324						
Mercury	7.4	0.40	ug	SW846 7470A	05/17/06	H4LPM1AC
		Dilution Factor: 2		Analysis Time..: 14:38	MDL.....: 0.12	

URS Corporation

Client Sample ID: HNCC-HV-12-M29-EIR

TOTAL Metals

Lot-Sample #...: H6E030192-018 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	1.4	0.40	ug	SW846 7470A	05/17/06	H4LPP1AA
		Dilution Factor: 2		Analysis Time..: 14:40	MDL.....: 0.12	

URS Corporation

Client Sample ID: HNCC-HV-12-M29-PERM

TOTAL Metals

Lot-Sample #...: H6E030192-019 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	0.31	0.16	ug	SW846 7470A	05/17/06	H4LPV1AA
		Dilution Factor: 0.79		Analysis Time..: 14:43	MDL.....: 0.047	

URS Corporation

Client Sample ID: HNCC-HV-12-M29-HCLRNS

TOTAL Metals

Lot-Sample #...: H6E030192-020 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135324						
Mercury	8.4	0.34	ug	SW846 7470A	05/17/06	H4LPW1AA
		Dilution Factor: 1.7		Analysis Time..: 14:45	MDL.....: 0.10	

URS Corporation

Client Sample ID: A-5410 MEDIA CHECK M29

TOTAL Metals

Lot-Sample #...: H6E030192-022 **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6135091						
Lead	ND G	1.2	ug	SW846 6010B	05/15-05/16/06	H4LP81AA
		Dilution Factor: 1		Analysis Time..: 18:18	MDL.....: 0.37	
Prep Batch #...: 6135322						
Mercury	ND	0.20	ug	SW846 7470A	05/17/06	H4LP81AC
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 0.060	

NOTE(S):

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: H6E150000-091 **Prep Batch #...:** 6135091						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H5DQT1AA
		Dilution Factor: 1				
		Analysis Time..: 14:22				
MB Lot-Sample #: H6E150000-095 **Prep Batch #...:** 6135095						
Lead	ND	1.0	ug	SW846 6010B	05/15-05/16/06	H5DQ01AA
		Dilution Factor: 1				
		Analysis Time..: 14:03				
MB Lot-Sample #: H6E150000-322 **Prep Batch #...:** 6135322						
Mercury	ND	0.20	ug	SW846 7470A	05/17/06	H5EDD1AA
		Dilution Factor: 1				
		Analysis Time..: 13:42				
MB Lot-Sample #: H6E150000-324 **Prep Batch #...:** 6135324						
Mercury	ND	0.010	ug	SW846 7470A	05/17/06	H5EDW1AA
		Dilution Factor: 0.05				
		Analysis Time..: 13:38				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Lot-Sample #...: H6E030192 **Matrix.....:** AIR

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Lead	96	(80 - 120)			SW846 6010B	05/15-05/16/06	6135091
	97	(80 - 120)	0.88	(0-20)	SW846 6010B	05/15-05/16/06	6135091
		Dilution Factor: 1			Analysis Time..: 14:28		
Lead	98	(80 - 120)			SW846 6010B	05/15-05/16/06	6135095
	97	(80 - 120)	1.0	(0-20)	SW846 6010B	05/15-05/16/06	6135095
		Dilution Factor: 1			Analysis Time..: 14:09		
Mercury	102	(80 - 120)			SW846 7470A	05/17/06	6135322
	103	(80 - 120)	1.2	(0-20)	SW846 7470A	05/17/06	6135322
		Dilution Factor: 1			Analysis Time..: 13:45		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Lot-Sample #...: H6E030192 **Matrix.....:** AIR

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Lead	10.0	9.63	ug	96		SW846 6010B	05/15-05/16/06	6135091
	10.0	9.72	ug	97	0.88	SW846 6010B	05/15-05/16/06	6135091
			Dilution Factor: 1			Analysis Time..: 14:28		
Lead	10.0	9.81	ug	98		SW846 6010B	05/15-05/16/06	6135095
	10.0	9.71	ug	97	1.0	SW846 6010B	05/15-05/16/06	6135095
			Dilution Factor: 1			Analysis Time..: 14:09		
Mercury	5.00	5.09	ug	102		SW846 7470A	05/17/06	6135322
	5.00	5.15	ug	103	1.2	SW846 7470A	05/17/06	6135322
			Dilution Factor: 1			Analysis Time..: 13:45		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AIR

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: H6E150000-324 **Prep Batch #...:** 6135324					
Mercury	99	(80 - 120)	SW846 7470A	05/17/06	H5EDW1AC
		Dilution Factor: 0.05	Analysis Time..: 13:40		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AIR

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: H6E150000-324 **Prep Batch #...:** 6135324							
Mercury	0.250	0.248	ug	99	SW846 7470A	05/17/06	H5EDW1AC
			Dilution Factor: 0.05		Analysis Time..: 13:40		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-010 **Prep Batch #...:** 6135324							
Mercury	NC,MSB	(80 - 120)			SW846 7470A	05/17/06	H4LNN1AD
	NC,MSB	(80 - 120)		(0-20)	SW846 7470A	05/17/06	H4LNN1AE
		Dilution Factor: 6					
		Analysis Time..: 17:24					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-010 **Prep Batch #...:** 6135324									
Mercury									
	11.2	2.00	12.9	ug			SW846 7470A	05/17/06	H4LNN1AD
			Qualifiers: NC,MSB						
	11.2	2.00	12.3	ug			SW846 7470A	05/17/06	H4LNN1AE
			Qualifiers: NC,MSB						
			Dilution Factor: 6						
			Analysis Time..: 17:24						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-011 **Prep Batch #...:** 6135324							
Mercury	112	(80 - 120)			SW846 7470A	05/17/06	H4LNT1AC
	113	(80 - 120)	0.37	(0-20)	SW846 7470A	05/17/06	H4LNT1AD
		Dilution Factor: 2					
		Analysis Time..: 14:17					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-011 **Prep Batch #...:** 6135324									
Mercury									
	3.1	2.00	5.32	ug	112		SW846 7470A	05/17/06	H4LNT1AC
	3.1	2.00	5.34	ug	113	0.37	SW846 7470A	05/17/06	H4LNT1AD

Dilution Factor: 2
Analysis Time..: 14:17

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-012 **Prep Batch #...:** 6135324							
Mercury	111	(80 - 120)			SW846 7470A	05/17/06	H4LN21AC
	117	(80 - 120)	5.3	(0-20)	SW846 7470A	05/17/06	H4LN21AD
		Dilution Factor: 0.7					
		Analysis Time..: 14:23					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-012 **Prep Batch #...:** 6135324									
Mercury									
	ND	0.700	0.777	ug	111		SW846 7470A	05/17/06	H4LN21AC
	ND	0.700	0.819	ug	117	5.3	SW846 7470A	05/17/06	H4LN21AD

Dilution Factor: 0.7
Analysis Time..: 14:23

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-013 **Prep Batch #...:** 6135324							
Mercury	107	(80 - 120)			SW846 7470A	05/17/06	H4LN51AC
	95	(80 - 120)	2.4	(0-20)	SW846 7470A	05/17/06	H4LN51AD
		Dilution Factor: 1.68					
		Analysis Time..: 14:33					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: H6E030192 **Matrix.....:** AA
Date Sampled...: 04/28/06 **Date Received..:** 05/02/06

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: H6E030192-013 **Prep Batch #...:** 6135324									
Mercury									
	6.6	1.68	8.43	ug	107		SW846 7470A	05/17/06	H4LN51AC
	6.6	1.68	8.23	ug	95	2.4	SW846 7470A	05/17/06	H4LN51AD

Dilution Factor: 1.68
Analysis Time..: 14:33

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Knoxville

ICP Data Reporting Form

ost Digestion Spike

Units: ug/L (ppb)

Instrument ID: TJA 61-E SuperTrace ICP

Data File Name: t051606.arc

Element	PDS H4LNEA	Original Sample H4LNE	Spike Added	Percent Recovery
Pb	7468.92	7658.94	100.0	-190.0

STL Knoxville

ICP Data Reporting Form

'ost Digestion Spike

Units: ug/L (ppb)

Instrument ID: TJA 61-E SuperTrace ICP

Data File Name: t051606.arc

Element	PDS D H4LNEA	Original Sample H4LNE	Spike Added	Percent Recovery
Pb	7530.51	7658.94	100.0	-128.4

STL Knoxville

ICP Data Reporting Form

Post Digestion Spike

Units: ug/L (ppb)

Instrument ID: TJA 61-E SuperTrace ICP

Data File Name: t051606.arc

Element	PDS H4LNNA	Original Sample H4LNN	Spike Added	Percent Recovery
Pb	99.09	0.00	100.0	99.1

STL Knoxville

ICP Data Reporting Form

ost Digestion Spike

Units: ug/L (ppb)

Instrument ID: TJA 61-E SuperTrace ICP

Data File Name: t051606.arc

Element	PDSD H4LNNA	Original Sample H4LNN	Spike Added	Percent Recovery
Pb	103.80	0.00	100.0	103.8

STL Knoxville

Mercury Data Reporting Form

Post Digestion Spike

Units: ug/L (ppb)

Instrument ID: Leeman HydraAA Hg

Data File Name: H051706. PRN

Element	PDS H4LNEA	Original Sample H4LNE	Spike Added	Percent Recovery
Hg	1.05	ND	1.0	105

STL Knoxville

Mercury Data Reporting Form

Post Digestion Spike

Units: ug/L (ppb)

Instrument ID: Leeman HydraAA Hg

Data File Name: H051706. PRN

Element	PDSD H4LNEA	Original Sample H4LNE	Spike Added	Percent Recovery
Hg	1.05	ND	1.0	105

Sample Data Summary

URS Corporation

Client Sample ID: HNCC-HV-1RB-ACE

General Chemistry

Lot-Sample #...: H6E030192-001 **Work Order #...:** H4LL5 **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Particulates (total)	1.6	0.50	mg	CFR60A 5	05/09-05/10/06	6130421

Dilution Factor: 1 MDL.....: 0.50

URS Corporation

Client Sample ID: HNCC-HV-1RB-FILTER

General Chemistry

Lot-Sample #...: H6E030192-002 **Work Order #...:** H4LMM **Matrix.....:** AA
Date Sampled...: 04/26/06 **Date Received..:** 05/02/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Particulates (total)	**0.60**	**0.50**	**mg**	**CFR60A 5**	**05/09-05/10/06**	**6130421**

Dilution Factor: 1 MDL.....: 0.50

URS Corporation

Client Sample ID: HNCC-HV-11-M29-PNR-ACE

General Chemistry

Lot-Sample #...: H6E030192-007 Work Order #...: H4LM7 Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Particulates (total)	31.5	0.50	mg	CFR60A 5	05/09-05/10/06	6130421

Dilution Factor: 1 MDL.....: 0.50

URS Corporation

Client Sample ID: HNCC-HV-11-M29-FILT

General Chemistry

Lot-Sample #...: H6E030192-008 Work Order #...: H4LND Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Particulates (total)	116	0.50	mg	CFR60A 5	05/09-05/10/06	6130421

Dilution Factor: 1 MDL.....: 0.50

URS Corporation

Client Sample ID: HNCC-HV-12-M29-PNR-ACE

General Chemistry

Lot-Sample #...: H6E030192-014 Work Order #...: H4LPA Matrix.....: AA
Date Sampled...: 04/28/06 Date Received..: 05/02/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Particulates (total)	23.2	0.50	mg	CFR60A 5	05/09-05/10/06	6130421

Dilution Factor: 1 MDL.....: 0.50

Sample Receipt Documentation

URS Chain of Custody Record

Samples from Multi-Metals Sampling Trains

Project	Hot Vent Stack Compliance Test
Site	Sun Coke Haverhill North Coke Company
Project Number	39400163.01
Prepared by	WL

Sample ID Code	Sample Matrix	Date/Time	PM by M5	Hg by M29	Pb by M29	Hold	MS/MSD	Comments
HNCC-HV-IRB-ACE	Acetone		X					
HNCC-HV-IRB-NA	0.1N Nitric Acid							
HNCC-HV-IRB-Water	DI Water			X				Add 33 ml to $KMnO_4$ per Sect. 9.1.4
HNCC-HV-IRB-NP	Nitric Acid/ Peroxide			X	X			
HNCC-HV-IRB-Perm	Permanganate Soln			X				2-Boxes, hand delivered no custody seal Intact [illegible] rec. temp. Ambient 20°C
HNCC-HV-IRB-HCl	HCl			X				
HNCC-HV-IRB-Filter	Filter		X	X	X			M.E. 5/2/06
HNCC-HV-IRB-Ace	Acetone		X	X	X			
HNCC-HV-IRB-NA	0.1N Nitric Acid			X	X			

Remarks: Provide results in total micrograms per sample. Raw data package required

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
[signature]	5/2/06	3:30	[signature]	5/2/06	15:30			
Received by:	Date	Time	Relinquished by:	Date	Time			

Received for Laboratory by	Date	Time	Airbill No.	Opened by	Seal #	Date	Time	Temp (C)

Seal #	Condition

Remarks

HbE030192

URS

Chain of Custody Record

Samples from Multi-Metals Sampling Trains

Project	Hot Vent Stack Compliance Test
Site	Sun Coke Haverhill North Coke Company
Project Number	39400163.01
Prepared by	WL

Sample ID Code	Sample Matrix	Date/Time	PM by MS	Hg by M29	Pb by M29	Hold	MS/MSD	Comments
HNCC-HV-11-M29-PNR-Ace	PNR - Acetone	//	X	X	X			
HNCC-HV-11-M29-PNR-NA	PNR - Nitric Acid	/		X	X			
HNCC-HV-11-M29-Filt	Filter	//	X	X	X			
HNCC-HV-11-M29-NI	Nitric Impinger	/		X	X			
HNCC-HV-11-M29-EIR	Empty Impinger Rinse	/		X				
HNCC-HV-11-M29-Perm	Permanganate Impinger	/		X				
HNCC-HV-11-M29-HClRns	HCl Rinse of Permanganate Imp	/		X				

Remarks: Provide results in total micrograms per sample. Raw data package required

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
[illegible]	5-2-04	7:30	[illegible]	5-2-04	15:30			
Received by:	Date	Time	Relinquished by:	Date	Time			

Received for Laboratory by	Date	Time	Airbill No.	Opened by:	Seal #	Date	Time	Temp (C)

Seal #	Condition

Remarks

URS

Chain of Custody Record

HWE030192

Samples from Multi-Metals Sampling Trains

Project	Hot Vent Stack Compliance Test
Site	Sun Coke Haverhill North Coke Company
Project Number	39400163.01
Prepared by	WL

Sample ID Code	Sample Matrix	Date/Time	PM by M5	Hg by M29	As Pb by M29	Hold	MS/MSD	Comments
HNCC-HV-12-M29-PNR-Ace	PNR - Acetone	✓	X	X	X			
HNCC-HV-12-M29-PNR-NA	PNR - Nitric Acid	✓		X	X			
HNCC-HV-12-M29-Filt	Filter	✓	X	X	X			
HNCC-HV-12-M29-NI	Nitric Impinger	✓		X	X			
HNCC-HV-12-M29-EIR	Empty Impinger Rinse	✓		X				
HNCC-HV-12-M29-Perm	Permanganate Impinger			X				
HNCC-HV-12-M29-HClRns	HCl Rinse of Permanganate Imp			X				

Remarks: Provide results in total micrograms per sample. Raw data package required

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
[signature]	5-28	3:30	[signature]	5-28-10	1530			
Received by:	Date	Time	Relinquished by:	Date	Time			

Received for Laboratory by	Date	Time	Airbill No.	Opened by:	Seal #	Date	Time	Temp (C)

Seal #	Condition

Remarks

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: S **Project:** Hot Vent - ACH Compliance Test **Lot Number:** HVE.030192

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)		✓		☐ 1a Do not match COC ☑ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	1b- COC Doesn't have time Date sampled. referenced container
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C; NC, 1668, 1613B: 0-4°C; VOST: 10°C; MA: 2-6 °C)	✓			☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☑ 4a Not present ☐ 4b Not intact ☐ 4c Other: Hand delivered	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes & appears to be >1%, was SOG notified? _____	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓				

Quote #: 70350 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 5/2/06

QA026R18.doc, 1/30/06

Appendix D

FIELD DATA SHEETS

Data Sheet – Determination of Cyclonic Flow
Preliminary Velocity/Temperature Traverse
EPA Methods 1 and 2

Project Name	HNCC
Project Number	39400163
Date	
Source	Hot Vent Stack #3
Operator	WA / JB

Run 1

Traverse Point	Yaw Angle	Yaw Direction (CW/CCW)	Velocity Head (ΔP)	Temperature (°F)
A 1	28.7	CCW	.23	1683
2	35.1	CCW	.29	1713
3	35.0	CCW	.43	1723
4	26.7	CCW	.45	1732
5	32.9	CCW	.42	1734
6	38.0	CCW	.40	1740
B 1	35.0	CCW	.10	1696
2	28.6	CCW	.30	1693
3	27.5	CCW	.28	1732
4	27.5	CCW	.28	1741
5	38.7	CCW	.23	1745
6	44.4	CCW	.30	1747

Traverse Point	Yaw Angle	Yaw Direction (CW/CCW)	Velocity Head (ΔP)	Temperature (°F)
C 1	39.7	CCW	.12	1703
2	35.7	CCW	.27	1710
3	27.4	CCW	.38	1718
4	32.7	CCW	.29	1724
5	40.3	CCW	.20	1730
6	40.5	CCW	.26	1735
D 1	30.7	CCW	.21	1670
2	25.5	CCW	.24	1700
3	28.1	CCW	.35	1722
4	35.4	CCW	.40	1730
5	39.9	CCW	.45	1731
6	41.7	CCW	.25	1734

Average Yaw Angle 33.97 $\bar{X}$ .296 1720.25

If this is greater than 20°, another approach must be found to determine the gas velocity.

$\sqrt{\Delta P}$ .544

Project 3940 0163

Recovery Person Initials: WW

Multi-Metals
Including Determination of PM
EPA Method 29

Condition No. 1

Run No.: 1

Date: 04/28/06

Moisture Determination

Imp No.	Contents	Volume (mL)	Configuration	Final Wt (g)	-	Initial Wt. (g)	=	Net Gain (g)
1	-[1]	-	K/O	704.3	-	615.1	=	89.2
2	Nitric/Peroxide	100	Mod	755.4	-	717.4	=	38.0
3	Nitric/Peroxide	100	S/G.	696.5	-	691.8	=	4.7
4	-	-	Mod	616.4	-	616.0	=	0.4
5	$KMnO_4$ Soln	100	Mod	724.7	-	725.1	=	-0.4
6	$KMnO_4$ Soln	100	Mod	721.7	-	722.5	=	-0.8
7	Silica Gel	~300g	Mod	860.4	-	852.4	=	8.2
				Total Net Gain (g) =				~~140.7~~ 139.3

Sample Log

Sample ID Number	No. of Sample Containers	Description
_____-____-M29-PNR-Ace		Probe and Nozzle Rinse - Acetone
_____-____-M29-PNR-NA		Probe and Nozzle Rinse - Nitric Acid
_____-____-M29-Filt		Filter
_____-____-M29-NI		Nitric Impinger
_____-____-M29-EIR		Empty Impinger Rinse
_____-____-M29-Perm		Permanganate Impinger
_____-____-M29-HClRns		HCl Rinse of Permanganate Impinger

[1] Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

Sample Recovery Checklist

AT LOCATION

_____ Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note – use teflon brush.

_____ Rinse and brush probe and nozzle with 0.1 M Nitric Acid into PNR-NA bottle. Note – use teflon brush

IN LABORATORY

_____ Separate filter holder and place filter in clean petri dish. Complete sample label.

_____ Rinse front half of filter holder with 0.1 M nitric acid into PNR bottle. Complete PNR sample label.

_____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.

_____ Pour contents of first 3 impingers into the Nitric/peroxide impinger catch bottle(s). Rinse the impingers and connecting glassware with 0.1 M nitric acid same bottle(s). Complete sample label(s).

_____ Rinse the 4th (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.

_____ Pour the contents of the 5th and 6th impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample label

_____ Rinse the permanganate impingers with a total of 25 mL of 8 N HCl. Complete HClRns sample label. (Note, this is not required if there is no visible solid residue)

_____ Log samples into logbook and store appropriately.

Sample Type – **Multi Metals (Method 29)**	Start Time 11:16	Condition 1	Page 1 of 1
Plant Name – HNCC	End Time	Run 1	Sampling Train Leak Rate (ft³ @ in. Hg)
Project Number - 39400163	Duration (min) 60	Operator WW	Initial 0 @ 12
Date 04/28/06	PTCF 0.84	Nozzle Dia (in) 0.375	Final 0 @ 10
ition (Source) - Hot Vent Stack #3	Console No. 0201004	Nozzle ID	Pitot Tube ID
Duct Dimension(s)	DGMCF ~~1.64~~ 0.96	Kf 3.764	Pitot Tube Leak Check
Elevation (relative to Barometer) (ft)	ΔH@ 1.643	Bar. Press. (in. H_2O) 30.00	Initial (+) 0 (-) 0
Nozzle Calib.		Stat. Press. (in. H_2O) .43	Final (+) 0 (-) 0

Point	Clock Time	Dry Gas Vol. (ft³)	ΔP (in. H_2O)	ΔH (in. H_2O)	Temperature (°F) Stack	Probe	Filter	Imp Exit	DGM In	DGM Out	Vacuum (in. Hg)
A 1	11:16	952.287	~~.22~~ .28	.75	1569		259	65		82	1.75
2		953.52	.30	1.11	1691		259	60		82	2.0
3		954.99	.30	1.11	1704		258	58		82	2.25
4		956.51	.38	1.41	1707		258	54		83	2.5
5		958.22	.38	1.41	1708		259	53		83	3.0
6		960.03	.38	1.41	1708		258	53		84	3.0
		961.667	.18	.67	1600		257	62		83	2.0
B 1		961.667	↓	↓	↓		↓	↓		↓	↓
2		962.90	.30	1.11	1698		257	56		83	2.5
3		964.36	.37	1.39	1746		258	52		83	3.0
4		966.00	.40	1.50	1750		259	56		84	3.5
5		967.77	.42	1.58	1753		260	56		84	3.75
6		969.58	.42	1.58	1798		261	57		85	4.0
		971.449									
C 1		971.449	.27	1.01	1750		260	68		86	3.0
2		972.90	.33	1.22	1863		262	59		87	3.0
3		974.48	.38	1.41	1875		262	57		87	4.0
4		976.38	.44	1.65	1898		261	56		87	4.5
5		977.99	.44	1.65	1920		264	56		87	5.0
6		979.80	.50	1.79	1915		263	57		88	5.5
		981.696	.21	.79							
D 1		981.696	↓	↓	1898		261	64		86	3.0
2		983.00	.30	1.11	1932		261	57		87	4.0
3		984.39	.36	1.35	1964		262	56		87	5.0
4		986.08	.40	1.50	1964		263	55		87	5.5
5		987.90	.46	1.72	1971		264	54		88	6.0
6		989.72	.46	1.72	1977		265	56		89	6.5
	1231	991.642									

Comments:

Data Sheet – Determination of Cyclonic Flow
Preliminary Velocity/Temperature Traverse
EPA Methods 1 and 2

Project Name	HNCC
Project Number	39400163
Date	4/28/06
Source	Hot Vent Stack #3
Operator	WCL/TJB

Run 2

Traverse Point	Yaw		Velocity Head (ΔP)	Temperature (°F)
	Angle	Direction (CW/CCW)		
A1	28.7	CCW	.24	1832
2	35.1	CCW	.37	1880
3	35.0	CCW	.47	1915
4	26.7	CCW	.50	1926
5	32.9	CCW	.46	1934
6	38.0	CCW	.42	1939
B1	35.0	CCW	.38	1925
2	28.6	CCW	.40	1935
3	27.5	CCW	.48	1938
4	27.5 ~~38.7~~	CCW	.49	1939
5	38.7 ~~44.4~~	CCW	.47	1936
6	44.4	CCW	.40	1939

Traverse Point	Yaw		Velocity Head (ΔP)	Temperature (°F)
	Angle	Direction (CW/CCW)		
C1	39.7	CCW	.30	1885
2	35.7	CCW	.40	1905
3	27.4	CCW	.42	1918
4	32.7	CCW	.47	1921
5	40.3	CCW	.49	1925
6	40.5	CCW	.49	1927
D1	30.7	CCW	.38	1896
2	25.5	CCW	.42	1908
3	28.1	CCW	.46	1909
4	35.4	CCW	.49	1914
5	39.9	CCW	.50	1916
6	41.7	CCW	.50	1916

Average Yaw Angle 33.9%

If this is greater than 20°, another approach must be found to determine the gas velocity.

Project: 39400163

Recovery Person Initials: _____

Multi-Metals
Including Determination of PM
EPA Method 29

Condition No. 1

Run No.: 2

Date: 04/28/06

Moisture Determination

Imp No.	Contents	Volume (mL)	Configuration	Final Wt (g)	-	Initial Wt. (g)	=	Net Gain (g)
1	-[1]	-	K/O	589.1	-	525.8	=	63.3
2	Nitric/Peroxide	100	Mod	737.3	-	717.3	=	20.0
3	Nitric/Peroxide	100	S/G.	687.1	-	688.0	=	-0.9
4	-	-	Mod	604.8	-	604.2	=	0.6
5	$KMnO_4$ Soln	100	Mod	624.4	-	625.5	=	-1.1
6	$KMnO_4$ Soln	100	Mod	720.5	-	721.0	=	-0.5
7	Silica Gel	~ 300g	Mod	844.0	-	832.5	=	11.5
				Total Net Gain (g)			=	92.9

Sample Log

Sample ID Number	No. of Sample Containers	Description
_____-____-M29-PNR-Ace		Probe and Nozzle Rinse - Acetone
_____-____-M29-PNR-NA		Probe and Nozzle Rinse - Nitric Acid
_____-____-M29-Filt		Filter
_____-____-M29-NI		Nitric Impinger
_____-____-M29-EIR		Empty Impinger Rinse
_____-____-M29-Perm		Permanganate Impinger
_____-____-M29-HClRns		HCl Rinse of Permanganate Impinger

[1] Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

Sample Recovery Checklist

AT LOCATION

_____ Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note – use teflon brush.

_____ Rinse and brush probe and nozzle with 0.1 M Nitric Acid into PNR-NA bottle. Note – use teflon brush

IN LABORATORY

_____ Separate filter holder and place filter in clean petri dish. Complete sample label.

_____ Rinse front half of filter holder with 0.1 M nitric acid into PNR bottle. Complete PNR sample label.

_____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.

_____ Pour contents of first 3 impingers into the Nitric/peroxide impinger catch bottle(s). Rinse the impingers and connecting glassware with 0.1 M nitric acid same bottle(s). Complete sample label(s).

_____ Rinse the 4th (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.

_____ Pour the contents of the 5th and 6th impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample label

_____ Rinse the permanganate impingers with a total of 25 mL of 8 N HCl. Complete HClRns sample label. (Note, this is not required if there is no visible solid residue)

_____ Log samples into logbook and store appropriately.

Sample Type – **Multi Metals (Method 29)**	Start Time 1346	Condition 1	Page 1 of 1
Plant Name – HNCC	End Time	Run 2	Sampling Train Leak Rate (ft³ @ in. Hg)
Project Number - 39400163	Duration (min) 60	Operator WW/TJB	Initial 0 @ 14
Date 04/28/06	PTCF 0.84	Nozzle Dia (in) 0.375	Final 0 @ 15
Location (Source) - HNCC	Console No. 0201004	Nozzle ID	Pitot Tube ID
Duct Dimension(s)	DGMCF 0.996	Kf 3.764	Pitot Tube Leak Check
Elevation (relative to Barometer) (ft)	ΔH@ 1.643	Bar. Press. (in. H₂O) 30.00	Initial (+) 0 (-) 0
Nozzle Calib.		Stat. Press. (in. H₂O) 0.43	Final (+) 0 (-) 0

Point	Clock Time	Dry Gas Vol. (ft³)	ΔP (in. H₂O)	ΔH (in. H₂O)	Temperature (°F) Stack	Probe	Filter	Imp Exit	DGM In	DGM Out	Vacuum (in. Hg)
D1	1346	992.313	.18	.68	1668		257	64		89	2.5
2		993.47	.29	1.10	1834		259	60		89	3.5
3		994.90	.34	1.29	1875		260	57		89	5.0
4		996.56	.40	1.50	1880		262	55		90	6.0
5		998.80	.45	1.70	1880		260	56		90	7.0
6		1000.26	.48	1.80	1889		260	56		90	8.0
		1002.177									
C1		1002.177	.39	1.49	1879		259	61		88	7.0
2		1004.10	.42	1.65	1877		260	57		89	7.0
3		1005.94	.46	1.72	1872		262	58		90	7.5
4		1007.83	.48	1.80	1876		261	58		90	8.0
5		1009.74	.48	1.80	1877		261	59		89	8.0
6		1011.68	.44	1.65	1879		262	60		88	8.0
		1013.563									
B1		1013.563	.37	1.30	1763		258	64		84	5.5
2		1015.34	.44	1.65	1852		256	59		84	5.5
3		1017.09	.45	1.70	1877		256	59		84	7.0
4		1018.93	.50	1.89	1878		254	60		83	9.0
5		1020.89	.51	1.90	1873		258	61		83	9.5
6		1022.88	.49	1.85	1869		257	62		84	9.5
		1024.875									
A1		1024.875	.23	.86	1322		257	60		80	3.5
2		1026.29	.38	1.35	1794		257	55		80	5.5
3		1027.95	.46	1.72	1852		259	53		80	7.5
4		1029.86	.50	1.89	1855		260	54		81	10.0
5		1031.79	.51	1.90	1858		259	53		80	10.0
6		1033.90	.49	1.85	1856		260	54		80	10.0
	1459	1035.710									

Comments:

Data Sheet – Determination of Cyclonic Flow
Preliminary Velocity/Temperature Traverse
EPA Methods 1 and 2

Project Name	HNCL
Project Number	39400163
Date	04/28/06
Source	Hot Vent Stack #3 Run 3
Operator	WCL/TJB

Traverse Point	Yaw Angle	Yaw Direction (CW/CCW)	Velocity Head (ΔP)	Temperature (°F)
A1	28.7	CCW	.38	1820
2	35.1	CCW	.42	1820
3	35.0	CCW	.46	1820
4	26.7	CCW	.49	1828
5	32.9	CCW	.49	1830
6	38.0	CCW	.48	1832
B1	35.0	CCW	.26	1737
2	28.6	CCW	.38	1787
3	27.5	CCW	.43	1813
4	27.5	CCW	.46	1824
5	38.7	CCW	.46	1833
6	41.4	CCW	.45	1834

Traverse Point	Yaw Angle	Yaw Direction (CW/CCW)	Velocity Head (ΔP)	Temperature (°F)
C1	39.7	CCW	.30	1780
2	35.7	CCW	.35	1799
3	27.4	CCW	.38	1810
4	32.7	CCW	.45	1814
5	40.3	CCW	.46	1822
6	40.5	CCW	.47	1827
D1	30.7	CCW	.32	1780
2	25.5	CCW	.34	1785
3	28.1	CCW	.40	1798
4	35.4	CCW	.45	1807
5	39.9	CCW	.48	1813
6	41.7	CCW	.48	1816

Average Yaw Angle ____.

If this is greater than 20°, another approach must be found to determine the gas velocity.

Project: 39400163

Recovery Person Initials: _____

Multi-Metals
Including Determination of PM
EPA Method 29

Condition No. 1

Run No.: 3

Date: 04/28/06

Moisture Determination

Imp No.	Contents	Volume (mL)	Configuration	Final Wt (g)	-	Initial Wt. (g)	=	Net Gain (g)
1	-[1]	-	K/O	542.6	-	532.1	=	
2	Nitric/Peroxide	100	Mod	739.4	-	714.4	=	
3	Nitric/Peroxide	100	S/G.	722.2	-	704.6	=	
4	-	-	Mod	601.4	-	586.2	=	
5	$KMnO_4$ Soln	100	Mod	673.2	-	717.2	=	
6	$KMnO_4$ Soln	100	Mod	Broken	-	713.2	=	
7	Silica Gel	~ 300g	Mod	847.8	-	838.3	=	
				visible $KMnO_4$ in impinger				
				Total Net Gain (g) =				

Sample Log

Sample ID Number	No. of Sample Containers	Description
_____-____-M29-PNR-Ace		Probe and Nozzle Rinse - Acetone
_____-____-M29-PNR-NA		Probe and Nozzle Rinse - Nitric Acid
_____-____-M29-Filt		Filter
_____-____-M29-NI		Nitric Impinger
_____-____-M29-EIR		Empty Impinger Rinse
_____-____-M29-Perm		Permanganate Impinger
_____-____-M29-HClRns		HCl Rinse of Permanganate Impinger

[1] Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

Sample Recovery Checklist

AT LOCATION

_____ Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note – use teflon brush.

_____ Rinse and brush probe and nozzle with 0.1 M Nitric Acid into PNR-NA bottle. Note – use teflon brush

IN LABORATORY

_____ Separate filter holder and place filter in clean petri dish. Complete sample label.

_____ Rinse front half of filter holder with 0.1 M nitric acid into PNR bottle. Complete PNR sample label.

_____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.

_____ Pour contents of first 3 impingers into the Nitric/peroxide impinger catch bottle(s). Rinse the impingers and connecting glassware with 0.1 M nitric acid same bottle(s). Complete sample label(s).

_____ Rinse the 4th (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.

_____ Pour the contents of the 5th and 6th impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample label

_____ Rinse the permanganate impingers with a total of 25 mL of 8 N HCl. Complete HClRns sample label. (Note, this is not required if there is no visible solid residue)

_____ Log samples into logbook and store appropriately.

Sample Type – **Multi Metals (Method 29)**	Start Time 1606	Condition 1	Page 1 of 1
Plant Name – HNCE	End Time	Run 3	Sampling Train Leak Rate (ft³ @ in. Hg)
Project Number - 39400163	Duration (min) 60	Operator WCL/TBJ	Initial 0 @ 10
Date 04/28/06	PTCF 0.84	Nozzle Dia (in) 0.375	Final @
ation (Source) - Hot Vert Stack #3	Console No. D201004	Nozzle ID	Pitot Tube ID
Duct Dimension(s)	DGMCF 0.996	Kf 3.764	Pitot Tube Leak Check
Elevation (relative to Barometer) (ft)	ΔH@ 1.643	Bar. Press. (in. H_2O) 30.00	Initial (+) 0 (-) 0
Nozzle Calib.		Stat. Press. (in. H_2O) -.43	Final (+) 0 (-) 0

Point	Clock Time	Dry Gas Vol. (ft³)	ΔP (in. H_2O)	ΔH (in. H_2O)	Temperature (°F) Stack	Probe	Filter	Imp Exit	DGM In	DGM Out	Vacuum (in. Hg)
A1	1606	036.656	0.23	0.86	1521		246	56		76	2.0
2		038.00	0.33	1.25	1766		249	54		76	2.0
3		039.77	0.40	1.50	1827		249	52		77	2.5
4		041.10	0.43	1.61	1842		253	51		78	3.0
5		042.90	0.46	1.70	1841		253	57		79	3.0
6		044.78	0.48	1.80	1842		286	52		80	3.0
		046.659									
B1		046.659	0.37	1.40	1733		256	62		79	2.5
2		048.40	0.36	1.35	1772		254	58		81	2.5
3		050.10	0.40	1.50	1842		256	58		81	3.0
4		051.87	0.46	1.71	1841		257	59		81	3.0
5		053.75	0.48	1.80	1839		258	60		82	3.5
6		055.69	0.46	1.71	1839		255	61		82	3.5
		057.599									
C1		057.599	0.20	0.75	1650		256	68		82	2.0
2		058.86	0.29	1.09	1776		257	62		83	2.5
3		060.33	0.34	1.28	1815		258	63		83	3.0
4		062.10	0.37	1.40	1816		258	63		83	3.5
5		063.70	0.40	1.50	1817		259	63		83	4.0
6		065.45	0.44	1.65	1819		259	65		83	4.0
		067.245									
D1		067.245									
2											
3											
4											
5											
6											

ments:

Appendix E

METHODS 3A AND 6C INFORMATION

Sun Coke Haverhill
Summary of Results

		Raw Concentrations			Bias Corrected Concentrations		
		O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
Run # 1	Average	6.63	10.40	631.96	6.50	10.38	626.20
	Max	10.26	12.27	829.80	10.13	12.25	824.03
	Min	3.57	8.38	388.00	3.44	8.36	382.23
Run # 2	Average	6.77	9.79	549.30	6.62	9.74	544.35
	Max	7.23	10.13	624.70	7.08	10.08	619.75
	Min	6.30	9.40	500.80	6.15	9.35	495.85
Run # 3	Average	6.80	9.98	582.30	6.65	9.91	577.91
	Max	7.03	10.18	649.40	6.88	10.11	645.00
	Min	6.54	9.70	529.50	6.39	9.63	525.10

URS

CALC. NO. _____

CALCULATION SHEET

SIGNATURE _____ DATE 4/27/06 CHECKED _____ DATE _____

PROJECT Sunco Haverhill JOB NO. _____

SUBJECT Hot Steek Vent SHEET 1 OF 2 SHEETS

Direct	Time	O2	CO2	SO2	Response O2/CO2	
Zero 14:10 /	14:24	0.09	0.0	0.5	up	1:09:53
mid	14:13	11.15	10.03		down	1:11:21
high	14:16	21.18	18.92		up	1:10:20
mid	14:27			487.7	down	1:12:42
high	14:29			992.2	up	1:09:67
					down	1:12:78

System	Time	O2	CO2	SO2
Zero 15:15:16 /	15:07	-0.03	0.09	10.0
mid	15:10	10.93	10.01	
mid	15:25			495.2

Start Run #1 @

URS

CALC. NO. _____

CALCULATION SHEET

SIGNATURE _____ DATE 4/28/06 CHECKED _____ DATE _____

PROJECT Sunco Haverhill JOB NO. _____

SUBJECT Hot Stack Vent SHEET 2 OF 2 SHEETS

System check	Time	O_2	CO_2	SO_2
Zero	7:43	0.15	0.0	
Zero	7:47			6.4
mid	7:38			493.6
mid	7:46	11.14	10.07	

Start Run #1 @ 11:16

end Run #1 @ 12:31

System Bias	Time	O_2	CO_2	SO_2
Zero	12:42	0.11	0.05	
Zero	12:45			5.1
mid	12:38			496.6
mid	12:45	10.99	10.12	

Start Run #2 @ 13:46

end Run #2 @ 14:59

System Bias	Time	O_2	CO_2	SO_2
Zero	15:24	0.19	0.06	
Zero	15:24			4.8
mid	15:18			494.8
mid	15:21	11.06	10.12	

Start Run #3 @ 16:06

end Run #3 @ 17:30

System Bias	Time	O_2	CO_2	SO_2
Zero	17:44	0.10	0.08	
Zero	17:44			4.0
mid	17:36			496.7
mid	17:40	10.98	10.07	

BOC GASES

Assay Laboratory
BOC GASES
1075 CINCLARE DRIVE
PORT ALLEN,LA 70767
(225) 388 0900

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Knoxville Gas&Gear
2300 SYCAMORE DR
KNOXVILLE, TN 379210000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	CC93481
EXPIRATION DATE	:	08-Jul-2007
CERTIFICATION DATE	:	08-Jul-2004
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24068162
LOT NUMBER	:	613534

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	10.0 %	+/-1.00% NIST Traceable	07/07/04
OXYGEN	11.00 %	11.0 %	+/-1.00% NIST Traceable	07/06/04
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060408	XC018739B	6.89 +/- 0.04 % CO2/N2	02/01/08
NTRM 82658	001119408	CC14322	9.72 +/- 0.11 % O2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet/550/AD19603531	FTIR	07/01/04
Siemens\Oxymat 5E	Paramagnetic	06/24/04

A division of The BOC Group, Inc.
A Delaware Corporation

QA Approved Cheryl Baker

Airgas.

Certificate of Analysis: EPA Protocol Gas Mixture

Cylinder Number: CC108893 Reference Number: 54-124051044-2
Cylinder Pressure: 2000.6 PSIG Expiration Date: 11/22/2008
Certification Date: 11/22/2005 Laboratory: ASG - Chicago - IL

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
CARBON DIOXIDE	18.70 %	+/- 1%	NDIR	G1
OXYGEN	20.93 %	+/- 1%	Paramagnetic	G1.
NITROGEN	Balance			

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences.

Notes:

Do not use cylinder below 150 psig.

Signature on file

Approval Signature

Reference Standard Information

Type	Balance Gas	Component	Cyl.Number	Concentration
GMIS 050805		OXYGEN	SG9163060BAL	20.98 %
NTRM 12805		CARBON DIOXIDE	SG9168808BAL	19.37 %

Analytical Results

1st Component CARBON DIOXIDE

1st Analysis Date: 11/22/2005

R 19.37	S 18.69	Z 0	Conc 18.69 %
S 18.67	Z 0	R 19.34	Conc 18.70 %
Z 0	R 19.34	S 18.67	Conc 18.70 %
			AVG: 18.70 %

2nd Component OXYGEN

1st Analysis Date: 11/22/2005

R 20.98	S 20.93	Z 0	Conc 20.93 %
S 20.93	Z 0	R 20.98	Conc 20.93 %
Z 0	R 20.98	S 20.93	Conc 20.93 %
			AVG: 20.93 %

Airgas

Airgas Great Lakes
2009 Bellaire Ave.
Royal Oak, MI 48067
(248) 399-8020 Fax: (248) 584-2540
www.airgas.com

Certificate of Analysis: EPA Protocol Gas Mixture

Cylinder Number:	XC031670B	Reference Number:	32-112360164-4
Cylinder Pressure:	1999.6 PSIG	Expiration Date:	12/10/2006
Certification Date:	12/10/2004	Laboratory:	MIC - Royal Oak - MI

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
SULFUR DIOXIDE	490.8 PPM	+/- 1%	Nondispersive Ultraviolet (NDUV)	G1
NITROGEN	Balance			

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences.

Notes: AIRGAS MID AMERICA

Do not use cylinder below 150 psig.

Approval Signature A. F. Muhammad

Reference Standard Information

Type	Balance Gas	Component	Cyl.Number	Concentration
NTRM 81661	NITROGEN	SULFUR DIOXIDE	XC006374B	486 PPM

Analytical Results

1st Component SULFUR DIOXIDE

1st Analysis Date: 12/03/2004

R 92.8	S 93.7	Z 0.0	Conc 490.7 PPM
S 93.7	Z 0.0	R 92.8	Conc 490.7 PPM
Z 0.0	R 92.8	S 93.7	Conc 490.7 PPM
			AVG: 490.7 PPM

2nd Analysis Date: 12/10/2004

R 92.8	S 93.7	Z 0.0	Conc 491 PPM
S 93.7	Z 0.0	R 92.8	Conc 491 PPM
Z 0.0	R 92.8	S 93.7	Conc 491 PPM
			AVG: 491 PPM

BOC GASES

Assay Laboratory
BOC GASES
1075 CINCLARE DRIVE
PORT ALLEN,LA 70767
(225) 388 0900

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Knoxville Gas&Gear
2300 SYCAMORE DR
KNOXVILLE, TN 379210000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC034602B
EXPIRATION DATE	:	09-Mar-2007
CERTIFICATION DATE	:	09-Mar-2004
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24014571
LOT NUMBER	:	599205

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
SULFUR DIOXIDE	1000.00 ppm	1000 ppm	+/-1.00% NIST Traceable	03/01/04 & 03/08/04
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81662	98060317	XC006925B	997.00 +/- 9.00 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet/550/AD19603531	FTIR	03/04/04

QA Approved Cheryl Baker

Sun Coke Haverhill
Run # 1

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	11:16	9.15	8.84	445.2	9.02	8.82	439.43
4/28/2006	11:17	8.93	8.98	458.1	8.80	8.96	452.33
4/28/2006	11:18	8.82	9.06	482.6	8.69	9.04	476.83
4/28/2006	11:19	8.80	9.08	493.7	8.67	9.06	487.93
4/28/2006	11:20	8.81	9.08	495.2	8.68	9.06	489.43
4/28/2006	11:21	8.75	9.15	493.8	8.62	9.13	488.03
4/28/2006	11:22	8.78	9.13	488.2	8.65	9.11	482.43
4/28/2006	11:23	8.74	9.18	493.7	8.61	9.16	487.93
4/28/2006	11:24	8.78	9.14	509.6	8.65	9.12	503.83
4/28/2006	11:25	8.74	9.17	513.9	8.61	9.15	508.13
4/28/2006	11:26	8.77	9.17	520.3	8.64	9.15	514.53
4/28/2006	11:27	8.82	9.14	531.4	8.69	9.12	525.63
4/28/2006	11:28	9.05	8.97	518.3	8.92	8.95	512.53
4/28/2006	11:29	9.09	8.90	500.9	8.96	8.88	495.13
4/28/2006	11:30	9.08	8.94	502.8	8.95	8.92	497.03
4/28/2006	11:31	9.13	8.86	507.6	9.00	8.84	501.83
4/28/2006	11:32	9.12	8.90	515.7	8.99	8.88	509.93
4/28/2006	11:33	9.53	8.55	477.0	9.40	8.53	471.23
4/28/2006	11:34	10.09	8.46	473.8	9.96	8.44	468.03
4/28/2006	11:35	10.26	8.38	451.2	10.13	8.36	445.43
4/28/2006	11:36	9.41	8.55	388.0	9.28	8.53	382.23
4/28/2006	11:37	9.02	8.91	471.3	8.89	8.89	465.53
4/28/2006	11:38	8.71	9.14	504.4	8.58	9.12	498.63
4/28/2006	11:39	8.42	9.28	498.7	8.29	9.26	492.93
4/28/2006	11:40	8.18	9.52	517.3	8.05	9.50	511.53
4/28/2006	11:41	7.69	9.95	539.9	7.56	9.93	534.13
4/28/2006	11:42	8.10	9.84	555.4	7.97	9.82	549.63
4/28/2006	11:43	9.16	9.19	539.1	9.03	9.17	533.33
4/28/2006	11:44	8.79	9.00	515.9	8.66	8.98	510.13
4/28/2006	11:45	8.56	9.18	522.0	8.43	9.16	516.23
4/28/2006	11:46	8.06	9.62	542.9	7.93	9.60	537.13
4/28/2006	11:47	7.69	9.87	563.7	7.56	9.85	557.93
4/28/2006	11:48	7.22	10.06	594.2	7.09	10.04	588.43
4/28/2006	11:49	6.54	10.60	617.7	6.41	10.58	611.93
4/28/2006	11:50	6.33	10.70	648.0	6.20	10.68	642.23
4/28/2006	11:51	6.86	10.29	644.5	6.73	10.27	638.73
4/28/2006	11:52	7.15	9.99	631.3	7.02	9.97	625.53
4/28/2006	11:53	7.16	10.01	612.7	7.03	9.99	606.93
4/28/2006	11:54	6.94	10.20	641.9	6.81	10.18	636.13
4/28/2006	11:55	6.44	10.59	659.8	6.31	10.57	654.03
4/28/2006	11:56	5.87	10.89	659.9	5.74	10.87	654.13
4/28/2006	11:57	5.59	11.05	645.4	5.46	11.03	639.63
4/28/2006	11:58	5.09	11.44	672.8	4.96	11.42	667.03
4/28/2006	11:59	5.40	11.24	707.0	5.27	11.22	701.23
4/28/2006	12:00	5.69	11.01	688.2	5.56	10.99	682.43
4/28/2006	12:01	5.78	10.88	687.6	5.65	10.86	681.83
4/28/2006	12:02	5.77	10.87	690.5	5.64	10.85	684.73
4/28/2006	12:03	5.59	11.02	687.1	5.46	11.00	681.33
4/28/2006	12:04	5.16	11.28	703.8	5.03	11.26	698.03
4/28/2006	12:05	4.93	11.38	697.1	4.80	11.36	691.33
4/28/2006	12:06	4.71	11.60	710.9	4.58	11.58	705.13

Sun Coke Haverhill
Run # 1

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	12:07	4.35	11.81	736.5	4.22	11.79	730.73
4/28/2006	12:08	4.60	11.61	726.7	4.47	11.59	720.93
4/28/2006	12:09	4.93	11.33	744.8	4.80	11.31	739.03
4/28/2006	12:10	4.98	11.33	756.8	4.85	11.31	751.03
4/28/2006	12:11	4.97	11.36	757.5	4.84	11.34	751.73
4/28/2006	12:12	4.65	11.58	770.2	4.52	11.56	764.43
4/28/2006	12:13	4.27	11.83	783.1	4.14	11.81	777.33
4/28/2006	12:14	3.99	12.02	783.8	3.86	12.00	778.03
4/28/2006	12:15	3.73	12.18	807.7	3.60	12.16	801.93
4/28/2006	12:16	3.57	12.27	824.9	3.44	12.25	819.13
4/28/2006	12:17	3.75	12.15	829.8	3.62	12.13	824.03
4/28/2006	12:18	3.74	12.16	822.3	3.61	12.14	816.53
4/28/2006	12:19	3.75	12.13	818.8	3.62	12.11	813.03
4/28/2006	12:20	3.92	12.00	811.3	3.79	11.98	805.53
4/28/2006	12:21	4.11	11.85	802.1	3.98	11.83	796.33
4/28/2006	12:22	4.06	11.89	799.2	3.93	11.87	793.43
4/28/2006	12:23	4.12	11.84	800.9	3.99	11.82	795.13
4/28/2006	12:24	4.19	11.79	795.2	4.06	11.77	789.43
4/28/2006	12:25	4.27	11.71	786.8	4.14	11.69	781.03
4/28/2006	12:26	4.28	11.70	782.0	4.15	11.68	776.23
4/28/2006	12:27	4.30	11.68	777.1	4.17	11.66	771.33
4/28/2006	12:28	4.31	11.66	745.6	4.18	11.64	739.83
4/28/2006	12:29	4.46	11.55	733.4	4.33	11.53	727.63
4/28/2006	12:30	4.55	11.46	711.3	4.42	11.44	705.53
4/28/2006	12:31	4.63	11.42	689.5	4.50	11.40	683.73
		Raw Concentrations			Bias Corrected Concentrations		
Average		6.63	10.40	631.96	6.50	10.38	626.20
Max		10.26	12.27	829.80	10.13	12.25	824.03
Min		3.57	8.38	388.00	3.44	8.36	382.23

Sun Coke Haverhill

Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	12:32	4.72	11.33	687.6
4/28/2006	12:33	4.78	11.30	682.5
4/28/2006	12:34	4.85	11.26	678.7
4/28/2006	12:35	5.37	10.37	678.0
4/28/2006	12:36	0.47	0.20	473.4
4/28/2006	12:37	0.13	0.10	496.4
4/28/2006	12:38	0.10	0.08	496.6
4/28/2006	12:39	0.32	0.54	370.1
4/28/2006	12:40	0.09	0.06	31.4
4/28/2006	12:41	0.13	0.05	16.6
4/28/2006	12:42	0.11	0.05	12.5
4/28/2006	12:43	6.94	6.55	9.9
4/28/2006	12:44	10.97	10.10	6.1
4/28/2006	12:45	10.99	10.12	5.1
4/28/2006	12:46	8.01	9.43	77.5
4/28/2006	12:47	5.18	10.92	625.3
4/28/2006	12:48	5.04	11.05	677.0
4/28/2006	12:49	5.00	11.08	689.0
4/28/2006	12:50	5.04	11.05	694.7

URS

CEM CALIBRATIONS

PROJECT NAME	Sun Coke haverhill
PROJECT NUMBER	39400163
DATE	4/27/2006 & 4/28/2006
RUN NUMBER	Run # 1 Stack Vent # 3
START TIME	11:16 AM
STOP TIME	12:31 PM

ANALYZER	SPAN
CO	100
CO_2	20
O_2	25
NO_x	
SO_2	1000
THC	

		CALIBRATION ERROR			SYSTEM BIAS CHECK								
					PRETEST		POST TEST						
	GAS CYLINDER NUMBER	CAL. GAS VALUE (% or PPM)	ANALYZER RESPONSE (% or PPM)	CAL ERROR (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	DRIFT (% SPAN)	IS CAL ERROR CHECK OK? (YES/NO)	IS PRETEST BIAS OK? (YES/NO)	IS POSTEST BIAS OK? (YES/NO)	IS SYSTEM DRIFT OK? (YES/NO)
CO_2 zero	Nitrogen	0.00	0.00	0.00	0.00	0.00	0.05	-0.25	-0.25	YES	YES	YES	YES
CO_2 mid	CC93481	10.00	10.03	-0.15	10.07	-0.20	10.12	-0.45	-0.25	YES	YES	YES	YES
CO_2 hi	CC108893	18.90	18.92	-0.10									
O_2 zero	Nitrogen	0.00	0.09	-0.36	0.15	-0.24	0.11	-0.08	0.16	YES	YES	YES	YES
O_2 mid	CC93481	11.00	11.15	-0.60	11.14	0.04	10.99	0.64	0.60	YES	YES	YES	YES
O_2 hi	CC108893	20.93	21.18	-1.00									
SO_2 zero	Nitrogen	0.00	0.50	-0.05	6.40	-0.59	5.10	-0.46	0.13	YES	YES	YES	YES
SO_2 mid	XC031670B	490.80	487.70	0.31	493.60	-0.59	496.60	-0.89	-0.30	YES	YES	YES	YES
SO_2 hi	XC034602B	1000.00	992.20	0.78									

Correction factors

CO_2	Avg. Conc -	0.025	*	0.9930487
O_2	Avg. Conc -	0.13	*	1.0059442
SO_2	Avg. Conc -	5.75	*	1.0029631

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 % , ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

Sun Coke Haverhill
Run # 2

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	13:46	6.31	10.06	529.2	6.16	10.01	524.25
4/28/2006	13:47	6.42	9.97	524.4	6.27	9.92	519.45
4/28/2006	13:48	6.42	9.97	519.6	6.27	9.92	514.65
4/28/2006	13:49	6.40	9.99	519.8	6.25	9.94	514.85
4/28/2006	13:50	6.47	9.94	507.5	6.32	9.89	502.55
4/28/2006	13:51	6.42	10.02	507.7	6.27	9.97	502.75
4/28/2006	13:52	6.30	10.13	537.6	6.15	10.08	532.65
4/28/2006	13:53	6.34	10.07	535.3	6.19	10.02	530.35
4/28/2006	13:54	6.38	10.03	547.7	6.23	9.98	542.75
4/28/2006	13:55	6.41	10.02	545.6	6.26	9.97	540.65
4/28/2006	13:56	6.38	10.03	553.8	6.23	9.98	548.85
4/28/2006	13:57	6.45	9.96	554.8	6.30	9.91	549.85
4/28/2006	13:58	6.46	9.97	556.3	6.31	9.92	551.35
4/28/2006	13:59	6.45	9.99	553.2	6.30	9.94	548.25
4/28/2006	14:00	6.35	10.07	566.4	6.20	10.02	561.45
4/28/2006	14:01	6.41	9.99	564.0	6.26	9.94	559.05
4/28/2006	14:02	6.52	9.91	556.0	6.37	9.86	551.05
4/28/2006	14:03	6.58	9.87	543.8	6.43	9.82	538.85
4/28/2006	14:04	6.53	9.92	541.2	6.38	9.87	536.25
4/28/2006	14:05	6.46	10.04	552.0	6.31	9.99	547.05
4/28/2006	14:06	6.54	10.09	598.2	6.39	10.04	593.25
4/28/2006	14:07	6.62	10.00	613.7	6.47	9.95	608.75
4/28/2006	14:08	6.55	10.06	624.7	6.40	10.01	619.75
4/28/2006	14:09	6.72	9.89	613.9	6.57	9.84	608.95
4/28/2006	14:10	6.71	9.88	603.4	6.56	9.83	598.45
4/28/2006	14:11	6.75	9.86	587.9	6.60	9.81	582.95
4/28/2006	14:12	6.62	9.99	584.7	6.47	9.94	579.75
4/28/2006	14:13	6.60	9.98	598.3	6.45	9.93	593.35
4/28/2006	14:14	6.54	10.02	591.1	6.39	9.97	586.15
4/28/2006	14:15	6.62	9.95	601.1	6.47	9.90	596.15
4/28/2006	14:16	6.57	10.02	613.0	6.42	9.97	608.05
4/28/2006	14:17	6.72	9.87	608.6	6.57	9.82	603.65
4/28/2006	14:18	6.81	9.83	581.8	6.66	9.78	576.85
4/28/2006	14:19	6.67	9.94	584.9	6.52	9.89	579.95
4/28/2006	14:20	6.75	9.85	582.2	6.60	9.80	577.25
4/28/2006	14:21	6.75	9.84	561.7	6.60	9.79	556.75
4/28/2006	14:22	6.87	9.75	540.9	6.72	9.70	535.95
4/28/2006	14:23	6.94	9.72	513.4	6.79	9.67	508.45
4/28/2006	14:24	6.91	9.74	513.6	6.76	9.69	508.65
4/28/2006	14:25	6.86	9.78	541.2	6.71	9.73	536.25
4/28/2006	14:26	6.89	9.73	554.8	6.74	9.68	549.85
4/28/2006	14:27	6.77	9.82	550.9	6.62	9.77	545.95
4/28/2006	14:28	6.81	9.76	542.7	6.66	9.71	537.75
4/28/2006	14:29	6.99	9.62	542.5	6.84	9.57	537.55
4/28/2006	14:30	6.91	9.70	564.8	6.76	9.65	559.85
4/28/2006	14:31	6.86	9.72	564.1	6.71	9.67	559.15
4/28/2006	14:32	6.77	9.80	568.1	6.62	9.75	563.15
4/28/2006	14:33	6.78	9.79	563.1	6.63	9.74	558.15
4/28/2006	14:34	7.05	9.57	548.9	6.90	9.52	543.95
4/28/2006	14:35	7.09	9.54	537.8	6.94	9.49	532.85
4/28/2006	14:36	6.94	9.71	531.5	6.79	9.66	526.55

Sun Coke Haverhill
Run # 2

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	14:37	6.87	9.74	552.2	6.72	9.69	547.25
4/28/2006	14:38	6.85	9.75	545.6	6.70	9.70	540.65
4/28/2006	14:39	6.99	9.61	539.1	6.84	9.56	534.15
4/28/2006	14:40	7.07	9.56	538.3	6.92	9.51	533.35
4/28/2006	14:41	7.12	9.52	513.6	6.97	9.47	508.65
4/28/2006	14:42	7.11	9.55	551.3	6.96	9.50	546.35
4/28/2006	14:43	7.10	9.57	545.3	6.95	9.52	540.35
4/28/2006	14:44	7.16	9.49	538.8	7.01	9.44	533.85
4/28/2006	14:45	7.07	9.57	531.8	6.92	9.52	526.85
4/28/2006	14:46	7.03	9.60	531.3	6.88	9.55	526.35
4/28/2006	14:47	7.16	9.50	530.6	7.01	9.45	525.65
4/28/2006	14:48	6.97	9.65	532.2	6.82	9.60	527.25
4/28/2006	14:49	6.96	9.64	526.5	6.81	9.59	521.55
4/28/2006	14:50	7.09	9.51	531.2	6.94	9.46	526.25
4/28/2006	14:51	7.13	9.50	524.1	6.98	9.45	519.15
4/28/2006	14:52	7.10	9.52	522.4	6.95	9.47	517.45
4/28/2006	14:53	7.23	9.40	513.9	7.08	9.35	508.95
4/28/2006	14:54	7.22	9.43	511.8	7.07	9.38	506.85
4/28/2006	14:55	7.13	9.50	514.7	6.98	9.45	509.75
4/28/2006	14:56	7.05	9.56	505.7	6.90	9.51	500.75
4/28/2006	14:57	7.11	9.51	502.7	6.96	9.46	497.75
4/28/2006	14:58	7.12	9.49	500.8	6.97	9.44	495.85
4/28/2006	14:59	7.06	9.54	501.0	6.91	9.49	496.05
		Raw Concentrations			Bias Corrected Concentrations		
Average		6.77	9.79	549.30	6.62	9.74	544.35
Max		7.23	10.13	624.70	7.08	10.08	619.75
Min		6.30	9.40	500.80	6.15	9.35	495.85

Sun Coke Haverhill

Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	15:00	7.20	9.43	507.9
4/28/2006	15:01	7.11	9.50	498.8
4/28/2006	15:02	7.07	9.54	487.3
4/28/2006	15:03	7.17	9.46	492.1
4/28/2006	15:04	7.05	9.57	491.2
4/28/2006	15:05	6.96	9.65	502.6
4/28/2006	15:06	6.98	9.66	505.7
4/28/2006	15:07	6.75	9.85	512.2
4/28/2006	15:08	6.67	9.92	502.3
4/28/2006	15:09	6.52	10.04	472.3
4/28/2006	15:10	6.00	8.30	464.5
4/28/2006	15:11	0.10	0.17	421.7
4/28/2006	15:12	0.04	0.09	437.8
4/28/2006	15:13	0.02	0.08	441.2
4/28/2006	15:14	0.06	0.07	443.0
4/28/2006	15:15	0.15	0.05	473.9
4/28/2006	15:16	0.16	0.05	492.0
4/28/2006	15:17	0.16	0.04	494.9
4/28/2006	15:18	0.16	0.04	494.8
4/28/2006	15:19	8.71	8.12	184.5
4/28/2006	15:20	11.04	10.10	11.3
4/28/2006	15:21	11.06	10.12	6.7
4/28/2006	15:22	3.90	3.24	5.5
4/28/2006	15:23	0.20	0.08	5.3
4/28/2006	15:24	0.19	0.06	4.8
4/28/2006	15:25	1.98	2.60	38.6

URS

CEM CALIBRATIONS

PROJECT NAME	Sun Coke haverhill
PROJECT NUMBER	39400163
DATE	4/27/2006 & 4/28/2006
RUN NUMBER	Run # 2 Stack Vent # 3
START TIME	1:46 PM
STOP TIME	2:59 PM

ANALYZER	SPAN
CO	
CO_2	20
O_2	25
NO_x	
SO_2	1000
THC	

		CALIBRATION ERROR			SYSTEM BIAS CHECK								
					PRETEST		POST TEST						
	GAS CYLINDER NUMBER	CAL. GAS VALUE (% or PPM)	ANALYZER RESPONSE (% or PPM)	CAL ERROR (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	DRIFT (% SPAN)	IS CAL ERROR CHECK OK? (YES/NO)	IS PRETEST BIAS OK? (YES/NO)	IS POSTEST BIAS OK? (YES/NO)	IS SYSTEM DRIFT OK? (YES/NO)
CO_2 zero	Nitrogen	0.00	0.00	0.00	0.05	-0.25	0.06	-0.30	-0.05	YES	YES	YES	YES
CO_2 mid	CC93481	10.00	10.03	-0.15	10.12	-0.45	10.12	-0.45	0.00	YES	YES	YES	YES
CO_2 hi	CC108893	18.90	18.92	-0.10									
O_2 zero	Nitrogen	0.00	0.09	-0.36	0.11	-0.08	0.19	-0.40	-0.32	YES	YES	YES	YES
O_2 mid	CC93481	11.00	11.15	-0.60	10.99	0.64	11.06	0.36	-0.28	YES	YES	YES	YES
O_2 hi	CC108893	20.93	21.18	-1.00									
SO_2 zero	Nitrogen	0.00	0.50	-0.05	5.10	-0.46	4.80	-0.43	0.03	YES	YES	YES	YES
SO_2 mid	XC031670B	490.80	487.70	0.31	496.60	-0.89	494.80	-0.71	0.18	YES	YES	YES	YES
SO_2 hi	XC034602B	1000.00	992.20	0.78									

Correction factors

CO_2	Avg. Conc -	0.055	*	0.993542
O_2	Avg. Conc -	0.15	*	1.0114943
SO_2	Avg. Conc -	4.95	*	1.0001019

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 % , ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

Sun Coke Haverhill
Run # 3

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	16:06	6.90	9.80	553.4	6.75	9.73	549.00
4/28/2006	16:07	6.72	9.98	554.8	6.57	9.91	550.40
4/28/2006	16:08	6.64	10.04	536.1	6.49	9.97	531.70
4/28/2006	16:09	6.66	9.99	553.7	6.51	9.92	549.30
4/28/2006	16:10	6.61	10.03	589.4	6.46	9.96	585.00
4/28/2006	16:11	6.64	10.02	571.0	6.49	9.95	566.60
4/28/2006	16:12	6.56	10.08	581.4	6.41	10.01	577.00
4/28/2006	16:13	6.54	10.08	583.8	6.39	10.01	579.40
4/28/2006	16:14	6.64	9.99	572.8	6.49	9.92	568.40
4/28/2006	16:15	6.61	10.02	593.8	6.46	9.95	589.40
4/28/2006	16:16	6.68	9.95	582.8	6.53	9.88	578.40
4/28/2006	16:17	6.88	9.77	559.0	6.73	9.70	554.60
4/28/2006	16:18	6.81	9.86	538.9	6.66	9.79	534.50
4/28/2006	16:19	6.72	9.92	543.4	6.57	9.85	539.00
4/28/2006	16:20	6.76	9.88	547.2	6.61	9.81	542.80
4/28/2006	16:21	6.72	9.92	550.1	6.57	9.85	545.70
4/28/2006	16:22	6.64	9.99	553.7	6.49	9.92	549.30
4/28/2006	16:23	6.70	9.92	535.9	6.55	9.85	531.50
4/28/2006	16:24	6.82	9.82	546.4	6.67	9.75	542.00
4/28/2006	16:25	6.97	9.70	550.0	6.82	9.63	545.60
4/28/2006	16:26	7.03	9.78	529.5	6.88	9.71	525.10
4/28/2006	16:27	6.95	9.96	562.8	6.80	9.89	558.40
4/28/2006	16:28	6.82	10.06	572.2	6.67	9.99	567.80
4/28/2006	16:29	6.79	10.06	565.6	6.64	9.99	561.20
4/28/2006	16:30	6.78	10.07	592.8	6.63	10.00	588.40
4/28/2006	16:31	6.73	10.10	621.2	6.58	10.03	616.80
4/28/2006	16:32	6.84	10.01	642.5	6.69	9.94	638.10
4/28/2006	16:33	6.84	10.00	647.9	6.69	9.93	643.50
4/28/2006	16:34	6.80	10.02	646.9	6.65	9.95	642.50
4/28/2006	16:35	6.85	9.99	649.4	6.70	9.92	645.00
4/28/2006	16:36	6.87	9.96	639.6	6.72	9.89	635.20
4/28/2006	16:37	6.86	9.98	639.1	6.71	9.91	634.70
4/28/2006	16:38	6.79	10.03	634.8	6.64	9.96	630.40
4/28/2006	16:39	6.81	9.99	623.8	6.66	9.92	619.40
4/28/2006	16:40	6.87	9.95	596.4	6.72	9.88	592.00
4/28/2006	16:41	6.95	9.89	567.7	6.80	9.82	563.30
4/28/2006	16:42	6.86	9.95	589.0	6.71	9.88	584.60
4/28/2006	16:43	6.94	9.88	580.0	6.79	9.81	575.60
4/28/2006	16:44	6.93	9.89	594.5	6.78	9.82	590.10
4/28/2006	16:45	6.92	9.92	632.3	6.77	9.85	627.90
4/28/2006	16:46	6.78	10.06	637.5	6.63	9.99	633.10
4/28/2006	16:47	6.78	10.08	638.9	6.63	10.01	634.50
4/28/2006	16:48	6.70	10.16	645.7	6.55	10.09	641.30
4/28/2006	16:49	6.73	10.12	645.3	6.58	10.05	640.90
4/28/2006	16:50	6.69	10.14	645.0	6.54	10.07	640.60
4/28/2006	16:51	6.65	10.18	642.9	6.50	10.11	638.50
4/28/2006	16:52	6.73	10.10	622.8	6.58	10.03	618.40
4/28/2006	16:53	6.84	10.01	578.1	6.69	9.94	573.70
4/28/2006	16:54	6.66	10.17	587.6	6.51	10.10	583.20
4/28/2006	16:55	6.72	10.11	596.0	6.57	10.04	591.60
4/28/2006	16:56	6.70	10.09	613.1	6.55	10.02	608.70

Sun Coke Haverhill
Run # 3

		Raw Concentrations			Bias Corrected Concentrations		
Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	16:57	6.77	10.05	625.4	6.62	9.98	621.00
4/28/2006	16:58	6.72	10.12	622.5	6.57	10.05	618.10
4/28/2006	16:59	6.75	10.08	619.4	6.60	10.01	615.00
4/28/2006	17:00	6.81	9.99	584.1	6.66	9.92	579.70
4/28/2006	17:01	6.84	9.97	560.4	6.69	9.90	556.00
4/28/2006	17:02	6.94	9.88	548.7	6.79	9.81	544.30
4/28/2006	17:03	6.98	9.90	548.2	6.83	9.83	543.80
4/28/2006	17:04	6.98	9.89	548.0	6.83	9.82	543.60
4/28/2006	17:05	6.90	9.92	553.0	6.75	9.85	548.60
4/28/2006	17:06	7.02	9.82	548.2	6.87	9.75	543.80
4/28/2006	17:07	6.95	9.86	547.9	6.80	9.79	543.50
4/28/2006	17:08	7.01	9.84	543.5	6.86	9.77	539.10
4/28/2006	17:09	7.01	9.87	546.9	6.86	9.80	542.50
4/28/2006	17:10	6.90	9.96	556.9	6.75	9.89	552.50
4/28/2006	17:11	6.84	10.00	556.6	6.69	9.93	552.20
4/28/2006	17:12	6.81	10.00	562.5	6.66	9.93	558.10
4/28/2006	17:13	6.79	10.00	567.8	6.64	9.93	563.40
4/28/2006	17:14	6.74	10.03	570.7	6.59	9.96	566.30
4/28/2006	17:15	6.81	9.96	573.9	6.66	9.89	569.50
4/28/2006	17:16	6.95	9.84	562.4	6.80	9.77	558.00
4/28/2006	17:17	6.95	9.84	549.4	6.80	9.77	545.00
4/28/2006	17:18	6.89	9.91	542.4	6.74	9.84	538.00
4/28/2006	17:19	6.90	9.91	542.3	6.75	9.84	537.90
4/28/2006	17:20	6.82	9.96	541.8	6.67	9.89	537.40
4/28/2006	17:21	6.68	10.06	554.6	6.53	9.99	550.20
4/28/2006	17:22	6.72	10.03	562.3	6.57	9.96	557.90
4/28/2006	17:23	6.70	10.03	572.9	6.55	9.96	568.50
4/28/2006	17:24	6.68	10.06	557.0	6.53	9.99	552.60
4/28/2006	17:25	6.70	10.04	585.1	6.55	9.97	580.70
4/28/2006	17:26	6.77	9.98	581.8	6.62	9.91	577.40
4/28/2006	17:27	6.70	10.03	587.3	6.55	9.96	582.90
4/28/2006	17:28	6.81	10.08	591.3	6.66	10.01	586.90
4/28/2006	17:29	6.88	10.02	603.2	6.73	9.95	598.80
4/28/2006	17:30	6.93	9.97	599.0	6.78	9.90	594.60
		Raw Concentrations			Bias Corrected Concentrations		
Average		6.80	9.98	582.30	6.65	9.91	577.91
Max		7.03	10.18	649.40	6.88	10.11	645.00
Min		6.54	9.70	529.50	6.39	9.63	525.10

Sun Coke Haverhill

Date	Hour	O2 (%)	CO2 (%)	SO2 (ppm)
4/28/2006	17:30	6.93	9.97	599.0
4/28/2006	17:31	6.97	9.95	589.6
4/28/2006	17:32	3.66	4.45	527.7
4/28/2006	17:33	0.12	0.10	495.4
4/28/2006	17:34	0.08	0.07	496.8
4/28/2006	17:35	0.09	0.06	497.3
4/28/2006	17:36	0.07	0.05	496.7
4/28/2006	17:37	0.06	0.04	497.0
4/28/2006	17:38	4.41	4.24	364.7
4/28/2006	17:39	10.95	10.03	15.5
4/28/2006	17:40	10.98	10.07	6.8
4/28/2006	17:41	11.00	10.08	5.0
4/28/2006	17:42	9.14	8.10	4.1
4/28/2006	17:43	0.13	0.14	4.1
4/28/2006	17:44	0.10	0.08	4.0
4/28/2006	17:45	0.09	0.06	3.6

URS

CEM CALIBRATIONS

PROJECT NAME	Sun Coke haverhill
PROJECT NUMBER	39400163
DATE	4/27/2006 & 4/28/2006
RUN NUMBER	Run # 3 Stack Vent # 3
START TIME	4:06 PM
STOP TIME	5:30 PM

ANALYZER	SPAN
CO	
CO_2	20
O_2	25
NO_x	
SO_2	1000
THC	

		CALIBRATION ERROR			SYSTEM BIAS CHECK								
					PRETEST		POST TEST						
	GAS CYLINDER NUMBER	CAL. GAS VALUE (% or PPM)	ANALYZER RESPONSE (% or PPM)	CAL ERROR (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	DRIFT (% SPAN)	IS CAL ERROR CHECK OK? (YES/NO)	IS PRETEST BIAS OK? (YES/NO)	IS POSTEST BIAS OK? (YES/NO)	IS SYSTEM DRIFT OK? (YES/NO)
CO_2 zero	Nitrogen	0.00	0.00	0.00	0.06	-0.30	0.08	-0.40	-0.10	YES	YES	YES	YES
CO_2 mid	CC93481	10.00	10.03	-0.15	10.12	-0.45	10.07	-0.20	0.25	YES	YES	YES	YES
CO_2 hi	CC108893	18.90	18.92	-0.10									
O_2 zero	Nitrogen	0.00	0.09	-0.36	0.19	-0.40	0.10	-0.04	0.36	YES	YES	YES	YES
O_2 mid	CC93481	11.00	11.15	-0.60	11.06	0.36	10.98	0.68	0.32	YES	YES	YES	YES
O_2 hi	CC108893	20.93	21.18	-1.00									
SO_2 zero	Nitrogen	0.00	0.50	-0.05	4.80	-0.43	4.00	-0.35	0.08	YES	YES	YES	YES
SO_2 mid	XC031670B	490.60	487.70	0.31	494.80	-0.71	496.70	-0.90	-0.19	YES	YES	YES	YES
SO_2 hi	XC034602B	1000.00	992.20	0.78									

Correction factors

CO_2	Avg. Conc -	0.07	*	0.9975062
O_2	Avg. Conc -	0.145	*	1.0114943
SO_2	Avg. Conc -	4.4	*	0.9988806

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 % , ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

Appendix F

INTENT TO TEST NOTIFICATION

Intent to Test Notification
Haverhill North Coke Company

March 22, 2006

Prepared for:

Haverhill North Coke Company
2446 Gallia Pike
Franklin Furnace, Ohio 45629

INTENT TO TEST NOTIFICATION
HAVERHILL NORTH COKE COMPANY

Prepared for:

Haverhill North Coke Company
2446 Gallia Pike
Franklin Furnace, Ohio 45629

Prepared by:

URS Corporation
1093 Commerce Park Drive, Suite 100
Oak Ridge, Tennessee 37830
Doc. #0510121

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ACRONYMS

CO	Carbon Monoxide
EPA	Environmental Protection Agency
HNCC	Haverhill North Coke Company
HRSG	Heat Recovery Steam Generator
MACT	Maximum Achievable Control Technology
NO_x	Nitrogen Oxides
OEPA	Ohio Environmental Protection Agency
SO_2	Sulfur Dioxide
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Haverhill North Coke Company (HNCC) utilizes Sun Coke's Thompson heat recovery type of oven to manufacture metallurgical coke. In coke production from both heat recovery and byproduct ovens, the volatile fraction of the coal is driven off in a reducing atmosphere. Coke is essentially the remaining carbon and ash. With byproduct ovens, the volatiles and combustion products are collected downstream of the oven chamber and refined in a chemical plant to produce coke oven gas and other products such as tar, ammonia, and light oils. In heat recovery ovens, all the coal volatiles are oxidized.

Heat recovery steam generators (HRSGs) recover heat from the oven waste gases. The cooled gases pass through a lime spray dryer/baghouse system prior to being exhausted from the main stack. The oven pushing/charging machine travels on rails between ovens during the production cycle. A traveling hood/baghouse system controls emissions from coal charging that escape the ovens. On the opposite side of the ovens from the pushing/charging machine, coke is pushed into a flat push hot car that travels on rails from the oven to the quench tower. A multicyclone captures and controls emissions from pushing the coke into the car and during travel to the quench tower. A baghouse controls particulate emissions from the coke screening and crushing facilities in the coke processing area.

There are currently 100 ovens at HNCC that operate on a 48-hour coking cycle. The operating schedule is arranged such that that half the ovens are charged each day. For example, the 50 even-numbered ovens are charged one day and the 50 odd-numbered ovens are charged the next. The cycle is staggered further such that 25 ovens are charged during one production shift and the other 25 ovens are charged 12 hours later.

2.0 TESTING

Initial compliance tests are required by the June 2004 construction permit for the main stack, an HRSG waste heat (vent) stack (hereafter called a vent stack), the pushing hot car, and the coke screening baghouse. Initial compliance tests for the main stack, the pushing hot car, and the coke screening baghouse were conducted in January of this year. Ohio Environmental Protection Agency (OEPA) agreed in a letter dated October 18, 2005 to postpone testing of the vent stack until a scheduled maintenance event. Also, the Ohio Office of the Attorney General agreed in a letter dated July 28, 2005 to remove the requirement to test the vent stack for NO_x, CO, and VOC.

Maintenance on a vent stack has been scheduled for the week of April 24. HNCC is planning to perform the initial compliance tests for the vent stack during this maintenance period and has prepared this Intent to Test Notification for submittal to OEPA.

2.1 Test Requirements and Technical Approach

The test requirements are summarized in Table 2-1 along with the EPA reference method proposed to perform the testing.

Table 2-1

Test Requirements

Emission Unit	Pollutant	Test Method	Comment
HRSG vent stack - P901	Particulates, lead, and mercury	EPA Method 29	
	SO_2	EPA Method 6C	
	Traverse point layout	EPA Method 1	
	Gas flowrate	EPA Method 2	As part of Method 29 testing
	Gas molecular weight	EPA Method 3A	
	Moisture	EPA Method 4	As part of Method 29 testing

2.2 Test Schedule

Three test runs will be performed for each of the test parameters. One of the test runs will be performed during production activities for the coke ovens serviced by the vent stack

being tested. A tentative test schedule is presented in Table 2-2 assuming the afternoon production cycle starts at 1600 hours on the day of testing.

Table 2-2

Test Schedule

Source	Run Number	Test Period	Comment
HRSG Vent Stack - P901	1	1130 - 1330	Mid-cycle
HRSG Vent Stack - P901	2	1430 - 1630	Late-cycle
HRSG Vent Stack - P901	3	1730 - 1930	Production

Assumes Production Cycle starts at 1600 hours. Test periods will be adjusted as necessary to accommodate a different production cycle start time.

2.3 Report Schedule

The permit requires submission of the test report within 30 days of conducting the test. However, the filters from the Method 29 train must be weighed to determine the particulate weight gain before they are submitted for metals analysis. As a result, the lead and mercury results will not be available for 4 to 5 weeks after testing. Therefore, it will not be possible to submit the test report within 30 days of conducting the test. It is proposed that the report be submitted 21 days after the laboratory analyses are completed.

2.4 Intent to Test Notification Form

The OEPA Intent to Test Notification Form is attached.

INTENT TO TEST NOTIFICATION (One Emissions Unit Per Sheet)

AGENCY USE ONLY

Date Received _____

Assigned _____

Proposed Test Date April 26, 2006

Pre-Test Meeting Desired? Yes ☐ No ☒

Facility Premise No. 0773000182

SCC Code NA

A. Facility Information

Name Haverhill North Coke Company

Address 2446 Gallia Pike, Franklin Furnace, OH 45629

Contact Person Tommy Roach

Telephone Number (740) 355-9800

B. Testing Firm Information

Name URS Corporation

Address Oak Ridge, TN

Contact Person Bill Thomas

Telephone Number (865) 220-8151

C. Test Plan and Emissions Unit Information Table: List the applicable information under each respective column heading.

Emissions Unit #	Control Equipment	Monitoring Equipment	Pollutant(s) to be Tested	EPA Test Method(s)	Filter Box Temperature	Number of Sampling Points	Total Time for Test Run	Number of Sampling Runs
P901 HRSG vent stack	None	None	Particulates, lead, mercury, flow rate, moisture	EPA Method 29	250F	Particulate traverse per Method 1	Minimum of 60 minutes	3
	None	None	Sulfur dioxide	EPA Method 6C	NA	1	Minimum of 60 minutes	3

Source is testing to comply with (check all that apply): ☒ State PTI ☐ State PTO ☐ Title V ☐ NSPS ☐ MACT ☐ BIF ☐ Title IV ☒ Other See text

D. What is the maximum rated capacity? 2,400 tons coal charged/day

Will Emissions Unit be operated at the maximum capacity given in its permit-to-install or permit-to-operate? Yes ☒ [within reason] No ☐ If no, attach explanation.

Specify how operating rate will be demonstrated during testing (*See notes 1, 2 and 3 on page 2.): Production records

Are any modifications to USEPA Reference Method(s) proposed? Yes ☐ No ☒ If "no" is checked, then no modification, however minor, will be accepted.

If yes, explain proposed modification(s): _____

Sampling Location(s): Inlet ☐ Outlet ☒ Simultaneous ☐ Will Cyclonic flow check(s) be conducted? Yes ☒ No ☐

Fuel Sampling: Coal - Proximate ☐ Ultimate ☐ Other ☐ If other, specify: NA

Emission rate to be calculated using: F-Factor ☐ Ultimate Coal Analysis ☐ Other ☒ If other, specify: pollutant concentrations and stack flow rates

Are concurrent Method 9 readings to be performed? Yes ☐ No ☒ Does the test method require audit samples? Yes ☐ No ☒

Has any maintenance or parts replacement been performed on the emissions unit or the control equipment within the last year? Yes ☐ No ☒

If yes, briefly describe: _____

(Note: Some maintenance, such as installing new filter bags in a baghouse, or replacing the activated carbon in an adsorber, may disqualify the emissions unit from a performance test until a sufficient amount of time has elapsed to ensure a test which will be representative of normal operations.)

E. Sample Train Calibration: All affected measuring and monitoring equipment should be calibrated within 60 days of the scheduled testing.

Appendix G

OEPA DIRECTOR'S LETTER
OCTOBER 18, 2005

OhioEPA

State of Ohio Environmental Protection Agency

STREET ADDRESS:

Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

OHIO E.P.A.

OCT 18 2005

ENTERED DIRECTOR'S JOURNAL

Certified Mail

October 18, 2005

Ms. Delauna Bratcher
Sun Coke Company
1111 Northshore Drive
Knoxville, TN 37919-4093

Re: PTI testing variance for Sun Coke Company PTI #07-00511.

Dear Ms. Bratcher:

I am writing in response to your letter of September 15,2005, requesting a variance from the testing requirements included in the air permit-to-install (PTI) #07-00511. You are requesting this variance in behalf of Sun Coke Company because of the difficulty complying with the testing requirements required by the PTI.

The following is a list of variances from the testing requirements that you are requesting:

1. No inlet testing of the screening baghouse and spray dryer is necessary based on the equipment design and lack of a location that meets EPA test criteria.

2. Testing requirements for the waste heat (vent) stack shall be performed during the first schedule period of HRSG maintenance.

3. Dioxin, furan, and acid gas testing shall be performed on the main (waste gas) stack only.

4. Mercury testing shall be performed on the main stack during initial testing and on one vent stack during a scheduled period of HRSG maintenance.

5. The pushing multicyclone shall be tested for particulate matter, SO_2, NOx, CO, VOC, and lead.

6. The Intent to Test including a sample protocol shall be submitted within two weeks of receiving an acceptance letter regarding the above conditions from the Agency. The testing shall be performed within 30 days after the

submittal of the Intent to Test.

After considering your submittal, your request for testing variances is granted, providing the following:

1. This letter does not exempt Sun Coke Company from compliance with any applicable regulations and permit terms.

2. The tests are performed according to the permit terms and conditions not waived by this variance and the variances listed in this letter.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 S. 4th
Room 222
Columbus, Ohio 43215

If you have any questions regarding this letter, please contact Dean Ponchak of the Southeast District Office at (740) 380-5297.

Sincerely,

Joseph P. Koncelik
Director
Ohio Environmental Protection Agency

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency

By: _____ Date 10-18-05

cc: Dean Ponchak, DAPC - SEDO
Rod Windle, DAPC
Terri Smith(2), DAPC
Donald L. Vanterpool, Legal Office

Appendix H

OHIO ATTORNEY GENERALS OFFICE LETTER
JULY 28, 2005

STATE OF OHIO
OFFICE OF THE ATTORNEY GENERAL
JIM PETRO, ATTORNEY GENERAL

Environmental Enforcement
30 E. Broad St.
Columbus, OH 43215-3400
Telephone: (614) 466-2766
Facsimile: (614) 644-1926
www.ag.state.oh.us

July 28, 2005

Anthony J. Giuliani, Esq.
Vorys, Sater, Seymour & Pease LLP
52 East Gay Street
P.O. Box 1008
Columbus, Ohio 43216-1008

SETTLEMENT COMMUNICATION – NOT ADMISSABLE AS EVIDENCE

RE: Response to Haverhill's comments submitted 7/13/05

Dear Anthony:

The following represents Ohio EPA's response to Sun Coke's further comments regarding the May 13, 2005 letter sent to this Office. Responses are identified by their number contained in that letter.

Mercury term: The term must remain as written. Ohio EPA will not do an enforcement discretion letter. Given the numerous changes already made to accommodate Sun Coke's concerns, Ohio EPA has compromised on this term and feels it now adequately serves Sun Coke's interests.

2 and 3. - The statement in these two comments about 3 minutes in one hour being BAT is incorrect. Due to the fact that one minute is BAT, Ohio wishes to enforce BAT on the Haverhill facility. The point about the consistency with the original permit and no change to the unit being performed is understood. Ohio EPA is willing to separate the storage pile into one pile for the first hundred batteries and one for the second. The one for the first may have the three minute BAT. This was an oversight on the part of the agency, but to be fair about the oversight, the agency is willing to allow coal appropriated to the first one hundred batteries to have the mistaken limit. The second hundred set of batteries will need to have piles associated to it with the correct BAT. If this is one pile then the correct BAT will apply.

9 and 15. - This was an oversight and will be corrected.

19. Ohio EPA is not sure what the discussion will be. We assume that Sun Coke will submit this data to Ohio EPA to adjust limits if necessary. Any HAP testing will remain due to the fact that Ohio EPA did not have the opportunity to send a representative to witness the test.

22. Ohio EPA does not see the reference to an hourly lead limit in the permit. Please specify the terms, if any, that left an hourly lead limit in the permit.

32. After consideration of this term, Ohio EPA believes the language was already in the permit under Part I - General Terms and conditions.

33. Ohio EPA believes that the MACT does not specify that these sections do not apply, therefore until a more exact reason is provided, Ohio EPA cannot make this change.

39. Ohio EPA is willing to only make a determination of the emission rates to be performed for NOx, CO, and VOC. This can be performed using methods 1 through 4 in combination with the concentrations from the main stack. The language can be revised to reflect this approach.

40. Ohio EPA cannot change its position at the present time with the current information submitted.

41. Ohio EPA cannot change its position due to US EPA requirements.

43. Ohio EPA cannot change its position at the present time with the current information submitted. Ohio EPA is under the impression that to better manage a control system, the Hg needs to be especiated.

48. Ohio EPA does not wish to revise the mass limit, only to revise it again after stack testing.

51 and 53. This was agreed to but then nullified by Mr. Barkdoll in the meeting because our agreement came with the following language:

"The activated carbon shall consist of readily available untreated commercial products that originate from bituminous or lignite coal. The untreated activated carbon shall meet a minimum iodine content of 500 mg/g and a physical specification of at least 90% by weight passing through a 325 mesh U.S. Sieve Size."

If Sun Coke wishes the language in the May 13, 2005 letter to now be inserted, then Ohio EPA will oblige.

52. The language must remain as written.

54, 55, & 56. Ohio EPA has inserted language to allow this requirement to be removed once the emission can be established to be consistent and in compliance. Language involving the use of an US EPA approved alternative for continuous Hg monitoring with Ohio EPA's written approval may be inserted if this resolves the issue.

58. Ohio EPA believes that the MACT does not specify that these sections do not apply, therefore until a more exact reason is provided, Ohio EPA cannot make this change.

59. Ohio EPA cannot change its position at the present time with the current information submitted.

If you have any questions or would like to set up a meeting to discuss these responses, please let me know.

Sincerely,

Nathaniel S. Orosz
Assistant Attorney General
Environmental Enforcement Section
30 East Broad Street, 25th Floor
Columbus, Ohio 43215-3400
(614) 466-5260

cc: Brett A. Kravitz, AGO, EES
Mike Hopkins/Rod Windle, OEPA, DAPC