

**Emission Test Report for
Vent Stack A-3 and
PCM A/B Stack**

**Test Dates:
November 3-4, 2020**

**Prepared for:
Indiana Harbor Operations
East Chicago, Indiana**



**Prepared by:
AECOM
Morrisville, NC**

EMISSION TEST REPORT FOR
VENT STACK A-3 AND
PCM A/B Stack

TEST DATES:
NOVEMBER 3-4, 2020

Prepared for:

Indiana Harbor Operations
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East Chicago, Indiana 46312

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December 2020

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	PROCESS DESCRIPTION	3
3.0	TEST RESULTS.....	5
3.1	Vent Stack A-3.....	5
3.2	Coking Stacks	6
3.3	PCM A/B	6
4.0	SAMPLING METHODOLOGY	8
4.1	EPA Reference Methods 1 and 2 - Volumetric Flow Rate	8
4.2	EPA Reference Method 3 - Stack Gas Molecular Weight.....	8
4.3	EPA Reference Method 5 – Filterable Particulate Matter	9
4.4	EPA Reference Method 202 – Condensable Particulate Matter	9
4.5	EPA Reference 9 – Opacity	10
Appendix A: PROCESS DATA		
Appendix B: VENT STACK VISIBLE EMISSIONS FIELD FORMS		
Appendix C: PCM VISIBLE EMISSIONS FIELD FORMS		
Appendix D: VENT STACK EMISSION CALCULATIONS AND DATA		
Appendix E: PCM EMISSION CALCULATIONS AND DATA		
Appendix F: ANALYTICAL REPORT		
Appendix G: CALIBRATION INFORMATION		

ACRONYMS

CFR	Code of Federal Regulations
CO ₂	Carbon Dioxide
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gr	grains
HRSG	Heat Recovery Steam Generator
IDEM	Indiana Department of Environmental Management
IHO	Indiana Harbor Operations
O ₂	Oxygen
PCM	Pusher Charger Machine
PM	Particulate Matter
VE	Visible Emission
VOC	Volatile Organic Compound
wc	water column

TEST CERTIFICATION SHEET
Emission Test Report for
Vent Stack A-3, and Baghouse Stack for Pusher Charger Machine 202B
at Indiana Harbor Operations

Team Leader/Project Manager

I was the project manager for the testing and preparation of this report and certify that the data, information, and results in this report are accurate and true as described by the methods and procedures cited herein.

Data collected under the supervision of others is included in this report and is presumed to have been gathered in accordance with recognized standards.

AECOM

A handwritten signature in black ink, appearing to read "Gerald S. Workman".

Gerald S. Workman

Project Manager

1.0 INTRODUCTION

AECOM performed air emissions tests on Vent Stack A-3 and Pusher Charger Machine A/B (PCM A/B) at Indiana Harbor Operations (IHO), East Chicago, Indiana, on November 3-4, 2020. The purpose of these tests was to demonstrate compliance with the particulate matter (PM) and visible emissions (VE) limits for these units as listed in the plant's Title V operating permit (T089-36982-00382) issued by the Indiana Department of Environmental Management (IDEM) on September 10, 2019. All tests were performed as described in the test protocol submitted to IDEM on June 30, 2020.

The stack testing was coordinated by Nancy Estrada (IHO) and performed by AECOM. The test team was led by Charles Thompson and included Willie Lea and Elijah Shayne Jacobs.

The emission limits and test results are summarized in Table 1. The PCM A/B baghouse tests demonstrated compliance with the PM limit; however, some of the VE readings during one production run exceeded the 20% limit. Testing at the PCM A/B demonstrated compliance with the permit limits.

Table 1. Summary of Emission Limits and Test Results

Emission Unit	Pollutant	Emission Limit	Measured Emissions	Comply With Limit?
Vent Stacks (part of ES201)	PM	22.328 lb/hour	19.481 lb/hr	Yes
	VEs	Opacity \leq 20% any 6-min period	(5) 6-min blocks with opacity $>20\%$ ^b	No
Coking Stacks ^a (ES201)	PM	0.03 gr/dscf	0.0146 gr/dscf	Yes
PCM A/B (ES202B)	PM	0.0081 lb/dry ton coal	0.0034 lb/dry ton coal	Yes
	VEs	Opacity \leq 20% any 6-min period	0% Opacity	Yes

^a These are combined limits for the 16 bypass vent stacks at IHO and the main stack at Cokenergy. See Table 4.

^b For test runs started during daylight hours

More detailed test results are presented in the report text along with a description of the test procedures. The appendices contain supporting information: Appendix A contains process data; Appendix B contains the vent stack visible emissions forms; Appendix C contains the PCM visible emissions forms; Appendix D contains the vent stack emission calculations and data;

Appendix E contains the PCM stack emission calculations and data; Appendix F contains the analytical report; and Appendix G contains equipment calibration information.

2.0 PROCESS DESCRIPTION

IHO utilizes SunCoke Energy's heat recovery type of oven to manufacture metallurgical coke. In coke production, the volatile fraction of the coal is driven off in a reducing atmosphere. Coke is essentially the remaining carbon and ash. Each oven is designed to carbonize up to 45 wet tons of coal. Flue gases are produced from the volatilization of coal - referred to as coal carbonization or "coking." The emissions from coking are discharged into a common afterburner tunnel that contains a heat recovery steam generator (HRSG) for every 16.75 ovens (16 HRSGs for 268 ovens). After passing through the HRSGs, the exhaust gases are treated by a semi-dry scrubber and baghouse system before being exhausted through the main stack. The HRSGs produce steam that goes to ArcelorMittal and for generating electricity by Cokenergy.

There are 16 identically configured bypass vent stacks for the 268 ovens – each is immediately upstream of one of the 16 HRSGs. During normal facility operations the vent stack lids remain closed. In the event of a process upset or outage of an HRSG that does not allow flue gases to be sent to the main stack, the corresponding vent stack lid will open to allow the oven exhaust gases from approximately 16.75 ovens to exhaust to atmosphere through the bypass vent stack. HRSG A-3 was temporarily taken out of service so that Vent Stack A-3 (part of emission unit ES201) could be opened during the vent stack tests.

The length of the coking cycle is approximately 48 hours. Coke is pushed out of an oven at the end of the cycle and coal is then charged back into the oven to start the process over again. Roughly half the ovens are pushed and charged each day - the "production" cycle (pushing and charging) occurs every day. The production cycle is divided into two periods where roughly every fourth oven is charged in each of two passes. Test runs were performed during the "coking" part of the cycle and during (or immediately after) "production" to ensure that the tests included different parts of the coke making cycle.

There are 268 ovens at IHO in 4 batteries – each with 67 ovens designated "A," "B," "C," and "D." The mobile PCMs charge coal into each oven from one side. Each PCM is equipped with a traveling hood/baghouse system that controls charging emissions that escape the ovens. IHO is permitted to operate two PCMs – one for Batteries A and B and one for Batteries C and

D. The PCM that charges coal into Batteries A and B is designated emission unit ES202B. The PCM that charges coal into Batteries C and D is designated emission unit ES203D.

The mobile PCMs are also used to push coke out of each oven. Pushing emissions are controlled by a linear shed that is attached to the ovens on the “coke side” of the ovens. The coke side shed is ducted to a baghouse. A hot plume rises and spreads into the shed during pushing. The ducts are in the upper section of the shed where they collect the hot plume and transport the pushing emissions to the baghouse and stack. There are several minutes between pushes (approximately 8 minutes). The ducts and baghouse capture and collect the pushing emissions plume from the shed during the interval between pushes, and the shed is ready to collect the plume when the next oven is pushed.

3.0 TEST RESULTS

The test results for each emission source tested are presented in this section.

3.1 Vent Stack A-3

The PM results from the bypass vent stack emissions test are summarized in Table 2. The emission limit for PM (and PM₁₀) is 22.328 lb/hour, which includes both filterable and condensable PM. Two test runs were performed during “coking” and two test runs were performed during (or immediately after) “production.” As has been approved by the agency for previous compliance tests, the average test run result was weighted assuming that only 20% of the operating time is production and 80% is coking.

Table 2. PM Results from Vent Stack A-3

Parameters	Run 1	Run 2	Run 3	Run 4	Average
Date	11/3/20	11/3/20	11/3/20	11/4/20	
Run times	12:00-13:20	15:05-16:25	17:00-18:22	07:45-09:07	
Relation to production cycle	Production	Coking	Coking	Production	
Sample time (minutes)	70	72	72	72	
Volume sampled (dscf)	33.435	36.106	39.010	37.247	36.449
Moisture content (% Vol.)	10.10	10.48	11.44	10.82	10.71
O ₂ (%)	9.9	10.2	10.2	10.3	10.1
CO ₂ (%)	7.1	6.8	6.9	6.9	6.9
Stack gas temperature (°F)	1468.8	1474.8	1535.8	1492.2	1492.9
Stack velocity (ft/min)	2,622	2,720	3,031	2,887	2,815
Gas flow rate (ACFM)	131,781	136,740	152,375	145,133	141,507
Gas flow rate (SCFM)	35,491	36,609	39,503	38,532	37,526
Gas flow rate (DSCFM)	31,905	32,775	34,983	34,365	33,507
Percent isokinetic	98.3	100.5	101.7	98.8	99.8
Concentration total PM (gr/dscf)	0.064	0.152	0.063	0.054	0.069 ^a
Particulate mass rate (lb/hour)					
Filterable	12.537	39.417	13.178	8.018	13.481 ^a
Condensable	43967	3.405	5.722	7.750	5.999 ^a
Total	17.504	42.822	18.900	15.768	19.481 ^a
Particulate limit (lb/hour)					22.328
6-minute periods >20% opacity	0	5	NA (Dark)	NA (Dark)	
Visible emissions limit	20% in any 6-minute period				
Complies with VE limit?	Yes	No	NA	NA	
Average wet tons charge/oven	38.7	38.6	38.5	38.2	38.5

^aAverage assumes that 20% of operating time is production

3.2 Coking Stacks

Some of the IHO emission limits (PM concentration, lead and VOCs) apply to the combined emissions from the Heat Recovery Coal Carbonization main stack (Stack 201) and the 16 vent stacks. Stack 201 was not tested at the time of the Vent Stack A-3 tests but was previously tested in December 2019. Compliance with these limits are determined through a weighted average of the gases exhausted from the vent stacks and main stack, as described in Operating Permit No. T089-36982-00382, Section D.1.13(e). The maximum allowable venting fraction is 19% [permit Section D.1.9(b)]. The weighted average of PM from the vent stacks and main stack is shown in Table 3 and is below the allowable combined permit limit.

Table 3. Weighted PM Result From Coking

Emission Unit	Main Stack (Stack 201)		Vent Stack (A-3)		Weighted Emissions	Permit Limit	In Compliance?
	Measured Emissions ^a	Fraction	Measured Emissions	Fraction			
PM	0.0021 gr/dscf	81%	0.069 gr/dscf	19%	0.015 gr/dscf	0.03 gr/dscf	Yes

^a This result is from the testing conducted on the Cokenergy main stack in December 2019.

3.3 PCM A/B

The results of the PCM emissions test are summarized in Table 4. The PM emission limit is 0.0081 pounds of PM per dry ton of coal charged (PM includes both filterable and condensable PM). Emissions from the PCM A/B baghouse were within the permit limit. The average measured PM emission rate for PCM A/B (ES202B) was 0.0034 lb/dry ton coal. No sampling or analytical issues were noted in these tests.

The VE limit for the PCM stacks is 20% opacity for any 6-minute period. The tests were performed during production periods where enough ovens were scheduled for charging so that the testing could be nearly continuous. VE readings were not taken during test runs 2 and 3 on PCM A/B due to lack of sufficient daylight. All VE readings on test run 1 demonstrated compliance, with no 6-minute observations at >20% opacity.

Table 3. Test Results from Pusher Charger Machines (PCM) A/B

Parameters	Run 1	Run 2	Run 3	Average
Date	11/4/20	11/4/20	11/4/20	
Run times	15:46 - 16:48	17:28 - 18:30	19:25 - 20:26	
Sample time (minutes)	60.0	60.0	60.0	
Volume sampled (dscf)	39.407	39.828/	42.120	40.452
Moisture content (% vol.)	1.51	1.70	1.39	1.53
O ₂ (%)	20.6	20.8	20.7	20.7
CO ₂ (%)	0.4	0.3	0.3	0.3
Stack gas temperature (°F)	111.6	105.3	100.8	105.9
Stack velocity (ft/min.)	2,658	2,674	2,817	2,716
Gas flow rate (ACFM)	41,499	41,750	43,971	42,407
Gas flow rate (SCFM)	37,619	38,271	40,655	38,849
Gas flow rate (DSCFM)	37,051	37,620	40,090	38,254
Percent isokinetic	98.8	98.3	97.6	98.2
Concentration total PM (gr/dscf)	0.0020	0.0016	0.0023	0.0020
Particulate mass rate (lb/hour)				
Filterable	0.18	0.10	0.18	0.16
Condensable	0.45	0.43	0.60	0.49
Total	0.63	0.53	0.79	0.65
Tons wet coal charge rate (tons in test hour)	229.9	154.3	231.3	
Coal moisture	7.08	7.08	7.08	
Tons dry coal charge rate (tons/hour)	213.7	143.4	214.9	
PM emission rate (lb/dry ton)	0.0029	0.0037	0.0037	0.0034
Particulate limit (lb/dry ton)				0.0081
Comply with limit?				Yes
Number of 6-min periods with VEs >20%	0	NA (Dark)	NA (Dark)	
Opacity limit PCM stack	>20% in any 6 minute period			
Comply with limit?	NA	NA	NA	

4.0 SAMPLING METHODOLOGY

The sampling methods used during the tests are summarized in Table 7.

Table 4. Test Method Summary

Parameter	Test Method
Traverse point layout	EPA Reference Method 1
Gas flowrate	EPA Reference Method 2
Gas molecular weight	EPA Reference Method 3
Filterable particulate and moisture	EPA Method 5
Condensable particulate	EPA Method 202
Opacity	EPA Method 9

Each test method used for the testing was based on methodology from Title 40 of Code of Federal Regulations Part 60 (40 CFR 60), Appendix A and 40 CFR 51, Appendix M. A description of the sampling is provided below.

4.1 EPA Reference Methods 1 and 2 - Volumetric Flow Rate

U.S. Environmental Protection Agency (EPA) Methods 1 and 2 were used to determine the sampling traverse layout and stack gas volumetric flow rate at the sampling location. The traverse point layout was determined using the procedures in EPA Reference Method 1. An integrated velocity traverse was conducted at discrete points during each test run for the vent stack. An S-type pitot tube and an inclined manometer were used to measure the velocity pressure. A type “K” thermocouple was used to measure the stack gas temperature at each traverse point. The absence of cyclonic flow was verified using the procedures in EPA Reference Method 1. The actual and standard volumetric flow rates were determined using the calculations in EPA Reference Method 2.

4.2 EPA Reference Method 3 - Stack Gas Molecular Weight

The stack gas oxygen (O₂) and carbon dioxide (CO₂) concentrations were determined in accordance with EPA Reference Method 3A, using gas analyzers, for the bypass vent stack tests. For the PCM and Pushing Baghouse, tedlar bag samples were collected and analyzed for O₂ and CO₂ using gas analyzers at the end of each run. The resulting O₂ and CO₂ concentrations were used to calculate the molecular weight of the stack gas.

4.3 EPA Reference Method 5 – Filterable Particulate Matter

The filterable PM testing was performed in accordance with EPA Reference Method 5. The PM sampling at the vent stack was performed by extracting a sample of the stack exhaust gas stream through a one-piece quartz nozzle and liner encased in an air cooled probe. The air cooled probe was needed to cool the vent stack flue gases from >1,800°F to <275°F. The probe was attached to a heated glass filter holder containing a pre-weighed, quartz-fiber filter. The filter heater box was maintained at a temperature of 248°F +25°F. For the PCMs and the Pushing Baghouse, the PM sample was collected using a Teflon-lined stainless steel nozzle connected to a quartz liner encased in a heated probe. The probe was attached to a heated glass filter holder containing a pre-weighed, quartz-fiber filter. The probe and filter heater box were maintained at a temperature of 248°F +25°F.

At the conclusion of each test run, the sample train was recovered by rinsing the sample probe and nozzle three times with acetone into a sample container. The filter was removed from the filter holder and placed into a Petri dish and sealed for transportation. The front half of the glass filter holder and connecting elbow were washed with acetone into the probe wash sample container. A sample of the acetone used in the sample recovery was collected and analyzed as a reagent blank. The acetone rinses and filters were analyzed by Enthalpy Analytical for filterable PM. The Enthalpy Analytical report is included in Appendix H of this report.

4.4 EPA Reference Method 202 – Condensable Particulate Matter

The condensable PM was measured using the procedures described in EPA Reference Method 202. The impinger train contains a water-jacketed coil condenser between the heated filter outlet and inlet to the first impinger. The water condensed in the coil condenser drops into a knockout impinger. The second impinger is initially empty. The cooled gas then passes through a Teflon filter maintained in the range of 65°F to 85°F. The third impinger initially contains 100 mL of distilled water. The fourth impinger contains approximately 200 grams of indicating

silica gel. The third and fourth impingers are placed in an ice bath to maintain the impinger train outlet temperature to $\leq 65^{\circ}\text{F}$.

After testing, the impinger train was moved to the test trailer. The weight gain of each impinger was measured and used to calculate the moisture content of the stack gas per EPA Method 5. The impingers were then purged for 60 minutes with ultra-high purity nitrogen at a flow rate of 14 liters per minute. The condenser, first two impingers, connecting glassware, and front-half of the Teflon filter holder were rinsed with water for the inorganic sample and with acetone followed by hexane for the organic sample. The Teflon filter, organic and inorganic rinses, and reagent blanks were analyzed by Enthalpy Analytical for inorganic and organic condensable PM. The Enthalpy Analytical report is included in Appendix H of this report.

4.5 EPA Reference 9 – Opacity

EPA Method 9 was used to determine the opacity. Opacity is a visual measurement of plume density by a qualified observer. The observer must be certified by demonstrating the ability to accurately assign the opacity readings to 25 different black and 25 different white plumes. The appearance of a plume as viewed by an observer depends upon a number of variables, such as angle of the observer with respect to the plume; angle of the observer with respect to the sun; point of observation of attached and detached steam plume; and angle of the observer with respect to a plume emitted from a rectangular stack with a large length to width ratio. The observer stands at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140° sector to his back and makes and records momentary observations at 15 second intervals. Compliance is determined by comparing the recorded observations to the opacity limit of the source.

Appendix A
PROCESS DATA

Stack A-3
Ovens 35-50

Run 1 Coking
Run 2-3 Production
Run 4 Coking

Run 1	Date 11/3/2020	Time 12:00 - 13:20		
BAT	OVEN	REF	CHARGED	CUR WGT
A	35	A35	10/29/20 4:02 PM	empty
A	36	A36	11/1/20 4:03 PM	38.1
A	37	A37	11/1/20 11:31 PM	39.0
A	38	A38	11/2/20 11:46 PM	38.5
A	39	A39	11/2/20 4:16 PM	38.5
A	40	A40	11/1/20 3:59 PM	39.1
A	41	A41	11/1/20 11:22 PM	39.0
A	42	A42	11/2/20 11:33 PM	38.5
A	43	A43	11/2/20 4:08 PM	38.5
A	44	A44	11/1/20 3:50 PM	39.0
A	45	A45	11/1/20 11:13 PM	39.0
A	46	A46	11/2/20 11:23 PM	38.5
A	47	A47	11/2/20 3:59 PM	38.5
A	48	A48	11/1/20 3:41 PM	39.0
A	49	A49	11/1/20 11:05 PM	39.0
A	50	A50	11/2/20 11:15 PM	38.5

38.7
Wet Tons

Run 2	Date 11/3/2020	Time 15:05 - 16:25		
BAT	OVEN	REF	CHARGED	CUR WGT
A	35	A35	10/29/20 4:02 PM	empty
A	36	A36	11/3/20 4:03 PM	38.1
A	37	A37	11/1/20 11:31 PM	39.0
A	38	A38	11/2/20 11:46 PM	38.5
A	39	A39	11/2/20 4:16 PM	38.5
A	40	A40	11/3/20 3:54 PM	38.1
A	41	A41	11/1/20 11:22 PM	39.0
A	42	A42	11/2/20 11:33 PM	38.5
A	43	A43	11/2/20 4:08 PM	38.5
A	44	A44	11/3/20 3:44 PM	38.0
A	45	A45	11/1/20 11:13 PM	39.0
A	46	A46	11/2/20 11:23 PM	38.5
A	47	A47	11/2/20 3:59 PM	38.5
A	48	A48	11/1/20 3:41 PM	39.0
A	49	A49	11/1/20 11:05 PM	39.0
A	50	A50	11/2/20 11:15 PM	38.5

38.6
Wet Tons

Run 3	Date 11/3/2020	Time 17:00 - 18:22		
BAT	OVEN	REF	CHARGED	CUR WGT
A	35	A35	10/29/20 4:02 PM	empty
A	36	A36	11/3/20 4:03 PM	38.1
A	37	A37	11/1/20 11:31 PM	39.0
A	38	A38	11/2/20 11:46 PM	38.5
A	39	A39	11/2/20 4:16 PM	38.5
A	40	A40	11/3/20 3:54 PM	38.1
A	41	A41	11/1/20 11:22 PM	39.0
A	42	A42	11/2/20 11:33 PM	38.5
A	43	A43	11/2/20 4:08 PM	38.5
A	44	A44	11/3/20 3:44 PM	38.0
A	45	A45	11/1/20 11:13 PM	39.0
A	46	A46	11/2/20 11:23 PM	38.5
A	47	A47	11/2/20 3:59 PM	38.5
A	48	A48	11/3/20 5:27 PM	38.1
A	49	A49	11/1/20 11:05 PM	39.0
A	50	A50	11/2/20 11:15 PM	38.5

38.5
Wet Tons

Run 4	Date 11/4/2020	Time 7:45 - 9:07		
BAT	OVEN	REF	CHARGED	CUR WGT
A	35	A35	10/29/20 4:02 PM	empty
A	36	A36	11/3/20 4:03 PM	38.1
A	37	A37	11/3/20 11:57 PM	38.1
A	38	A38	11/2/20 11:46 PM	38.5
A	39	A39	11/4/20 4:39 PM	38.1
A	40	A40	11/3/20 3:54 PM	38.1
A	41	A41	11/3/20 11:49 PM	38.0
A	42	A42	11/2/20 11:33 PM	38.5
A	43	A43	11/4/20 4:29 PM	38.2
A	44	A44	11/3/20 3:44 PM	38.0
A	45	A45	11/3/20 11:40 PM	38.0
A	46	A46	11/4/20 11:51 PM	38.0
A	47	A47	11/4/20 4:20 PM	38.2
A	48	A48	11/3/20 5:27 PM	38.1
A	49	A49	11/3/20 11:33 PM	38.0
A	50	A50	11/2/20 11:15 PM	38.5

38.2
Wet Tons

Date:		Thu, Nov 05, 2020				coal moisture 7.08% // vm 26.21							
				Total Ovens		34							
				AVG. WT.		38.4							
	BAT	INDEX	OVEN	CHARGE WEIGHT	FRONT LEVELER	REAR LEVELER	CHARGE WEIGHT	PREVIOUS PUSH TIME	BLOCK TIME	RUN	Floor Rebuild	CARRY OVER	
1	A	67	A67	38.5	12.13	9.13	38.5	11/4/20 6:35 PM	2:30 PM	67-3			
2	A	63	A63	38.5	12.38	9.38	38.6	11/4/20 3:47 PM		67-3			
3	A	59	A59	38.5	12.63	9.63	38.6	11/4/20 6:46 PM		67-3			
4	A	55	A55	38.5	13.13	10.13	38.6	11/4/20 3:59 PM		67-3			
5	A	51	A51	38.0	13.00	10.00	38.2	11/4/20 4:11 PM		67-3			
6	A	47	A47	38.0	14.25	11.25	38.2	11/4/20 4:20 PM		67-3			
7	A	43	A43	38.0	14.00	11.00	38.2	11/4/20 4:29 PM		67-3			
8	A	39	A39	38.0	13.00	10.00	38.1	11/4/20 4:39 PM		67-3			
9	A	31	A31	38.5	12.63	9.63	38.6	11/4/20 4:49 PM		67-3			
10	A	27	A27	38.5	12.88	9.88	38.5	11/4/20 4:57 PM		67-3			
11	A	23	A23	38.5	13.63	10.63	38.6	11/4/20 5:06 PM		67-3			
12	A	19	A19	38.5	12.88	9.88	38.6	11/4/20 5:15 PM		67-3			
13	A	15	A15	38.5	12.63	9.63	38.5	11/4/20 5:24 PM		67-3			
14	A	11	A11	38.5	13.38	10.38	38.6	11/4/20 5:33 PM		67-3			
15	A	8	A08	38.5	12.38	9.38	38.6	11/4/20 5:57 PM		64-4			
16	A	7	A07	38.5	14.38	11.38	38.6	11/4/20 5:45 PM		67-3			
17	A	3	A03	38.5	10.38	7.38	38.6	11/4/20 6:08 PM		67-3			
18	A	66	A66	38.5	12.88	9.88	38.6	11/4/20 11:06 PM	10:30 PM	66-2			
19	A	62	A62	38.5	11.88	8.88	38.5	11/4/20 11:15 PM		66-2			
20	A	58	A58	38.5	11.63	8.63	38.5	11/4/20 11:24 PM		66-2			
21	A	54	A54	38.5	11.88	8.88	38.6	11/4/20 11:33 PM		66-2			
22	A	50	A50	38.0	13.50	10.50	38.1	11/4/20 11:42 PM		66-2			
23	A	46	A46	38.0	14.50	11.50	38.0	11/4/20 11:51 PM		66-2			
24	A	42	A42	38.0	13.50	10.50	38.5	11/2/20 11:33 PM		66-2			
25	A	38	A38	38.0	14.00	11.00	38.5	11/2/20 11:46 PM		66-2			
26	A	34	A34	38.5	11.63	8.63	38.5	11/3/20 12:44 AM		66-2			
27	A	30	A30	38.5	12.38	9.38	38.6	11/3/20 12:54 AM		66-2			
28	A	26	A26	38.5	12.63	9.63	38.6	11/3/20 1:02 AM		66-2			
29	A	22	A22	38.5	11.63	8.63	38.6	11/3/20 1:12 AM		66-2			
30	A	18	A18	38.5	11.88	8.88	38.5	11/3/20 1:21 AM		66-2			
31	A	14	A14	38.5	12.63	9.63	38.7	11/3/20 1:29 AM		66-2			
32	A	10	A10	38.5	12.63	9.63	38.6	11/3/20 1:38 AM		66-2			
33	A	6	A06	38.5	12.13	9.13	38.6	11/3/20 1:47 AM		66-2			
34	A	2	A02	38.5	9.88	6.88	38.5	11/3/20 1:55 AM		66-2			

Date:		Thu, Nov 05, 2020		coal moisture 7.08% // vm 26.21								
Total Ovens				34								
AVG. WT.				38.3								
	BAT	INDEX	OVEN	CHARGE WEIGHT	FRONT LEVELER	REAR LEVELER	CHARGE WEIGHT	PREVIOUS PUSH TIME	BLOCK TIME	RUN	Floor Rebuild	CARRY OVER
1	B	67	B67	38.5	13.88	10.88	38.5	11/4/20 7:31 PM	6:30 PM	67-3		
2	B	63	B63	38.5	14.63	11.63	38.5	11/4/20 7:42 PM		67-3		
3	B	59	B59	38.5	14.13	11.13	38.6	11/4/20 7:50 PM		67-3		
4	B	55	B55	38.5	14.38	11.38	38.6	11/4/20 8:01 PM		67-3		
5	B	51	B51	38.5	13.88	10.88	38.5	11/4/20 8:10 PM		67-3		
6	B	47	B47	38.5	14.38	11.38	38.5	11/4/20 8:18 PM		67-3		
7	B	43	B43	38.5	13.88	10.88	38.6	11/4/20 8:28 PM		67-3		
8	B	39	B39	38.5	13.88	10.88	38.6	11/4/20 8:37 PM		67-3		
9	B	35	B35	38.5	13.38	10.38	38.6	11/4/20 8:46 PM		67-3		
10	B	31	B31	38.5	12.13	9.13	38.5	11/4/20 8:56 PM		67-3		
11	B	27	B27	38.5	12.63	9.63	38.6	11/4/20 9:05 PM		67-3		
12	B	23	B23	38.5	12.13	9.13	38.6	11/4/20 9:14 PM		67-3		
13	B	19	B19	38.5	12.13	9.13	38.5	11/4/20 9:23 PM		67-3		
14	B	15	B15	38.5	11.88	8.88	38.6	11/4/20 9:33 PM		67-3		
15	B	11	B11	37.0	10.00	7.00	37.1	11/4/20 9:43 PM		67-3		
16	B	7	B07	37.0	7.25	4.25	37.1	11/4/20 9:53 PM		67-3		
17	B	3	B03	37.0	12.50	9.50	37.1	11/4/20 10:02 PM		67-3		
18	B	66	B66	38.0	13.50	10.50	38.0	11/3/20 3:41 AM	3:00 AM	66-2		
19	B	62	B62	38.5	13.38	10.38	38.6	11/3/20 3:51 AM		66-2		
20	B	58	B58	38.5	13.38	10.38	38.5	11/3/20 4:00 AM		66-2		
21	B	54	B54	38.5	13.38	10.38	38.6	11/3/20 4:08 AM		66-2		
22	B	50	B50	38.5	13.88	10.88	38.5	11/3/20 4:16 AM		66-2		
23	B	46	B46	38.5	13.38	10.38	38.5	11/3/20 4:28 AM		66-2		
24	B	42	B42	38.5	13.38	10.38	38.5	11/3/20 4:37 AM		66-2		
25	B	38	B38	38.5	13.38	10.38	38.7	11/3/20 4:46 AM		66-2		
26	B	34	B34	38.5	13.38	10.38	38.6	11/3/20 4:55 AM		66-2		
27	B	30	B30	38.5	12.38	9.38	38.6	11/3/20 5:04 AM		66-2		
28	B	26	B26	38.5	12.13	9.13	38.5	11/3/20 5:12 AM		66-2		
29	B	22	B22	38.5	11.88	8.88	38.5	11/3/20 5:20 AM		66-2		
30	B	18	B18	38.5	11.88	8.88	38.6	11/3/20 5:29 AM		66-2		
31	B	14	B14	38.5	12.13	9.13	38.7	11/3/20 5:38 AM		66-2		
32	B	10	B10	37.0	9.25	6.25	37.1	11/3/20 5:47 AM		66-2		
33	B	6	B06	38.5	9.38	6.38	38.6	11/3/20 5:59 AM		66-2		
34	B	2	B02	37.0	11.25	8.25	37.1	11/3/20 6:09 AM		66-2		

A/B PCM

11/4/2020

15:46 - 20:26

BAT	OVEN	REF	CHARGED	CUR WGT
A	63	A63	11/4/20 3:47 PM	38.6
A	55	A55	11/4/20 3:59 PM	38.6
A	51	A51	11/4/20 4:11 PM	38.2
A	47	A47	11/4/20 4:20 PM	38.2
A	43	A43	11/4/20 4:29 PM	38.2
A	39	A39	11/4/20 4:39 PM	38.1

52 **229.9** 7.08% **213.7**
minutes of production charge wt. H2O of Coal dry charge wt.

A	11	A11	11/4/20 5:33 PM	38.6
A	8	A08	11/4/20 5:57 PM	38.6
A	7	A07	11/4/20 5:45 PM	38.6
A	3	A03	11/4/20 6:08 PM	38.6

35 **154.3** 7.08% **143.4**
minutes of production charge wt. H2O of Coal dry charge wt.

B	67	B67	11/4/20 7:31 PM	38.5
B	63	B63	11/4/20 7:42 PM	38.5
B	59	B59	11/4/20 7:50 PM	38.6
B	55	B55	11/4/20 8:01 PM	38.6
B	51	B51	11/4/20 8:10 PM	38.5
B	47	B47	11/4/20 8:18 PM	38.5

47 **231.3** 7.08% **214.9**
minutes of production charge wt. H2O of Coal dry charge wt.

Stack A-3

Ovens 35-50

Run 1 Coking

Run 2-3 Production

Run 4 Coking

Run Date Time
1 11/3/2020 12:00 - 13:20

BAT	OVEN	REF	CHARGED	CUR WGT	CUR WGT
A	35	A35	10/29/20 4:02 PM	129	empty
A	36	A36	11/3/20 4:03 PM	9	No data
A	37	A37	11/3/20 11:57 PM	1	No data
A	38	A38	11/2/20 11:46 PM	25	38.5
A	39	A39	11/4/20 4:39 PM	-16	No data
A	40	A40	11/3/20 3:54 PM	9	No data
A	41	A41	11/3/20 11:49 PM	1	No data
A	42	A42	11/2/20 11:33 PM	25	38.5
A	43	A43	11/4/20 4:29 PM	-15	No data
A	44	A44	11/3/20 3:44 PM	9	No data
A	45	A45	11/3/20 11:40 PM	1	No data
A	46	A46	11/4/20 11:51 PM	-23	No data
A	47	A47	11/4/20 4:20 PM	-15	No data
A	48	A48	11/3/20 5:27 PM	8	No data
A	49	A49	11/3/20 11:33 PM	1	No data
A	50	A50	11/4/20 11:42 PM	-23	No data

38.5

Wet Tons

8/13/2020 17:30

Run Date Time
2 11/3/2020 15:05 - 16:25

BAT	OVEN	REF	CHARGED	CUR WTS	CUR WGT
A	35	A35	10/29/20 4:02 PM	129	empty
A	36	A36	11/3/20 4:03 PM	9	38.1
A	37	A37	11/3/20 11:57 PM	1	No data
A	38	A38	11/2/20 11:46 PM	25	38.5
A	39	A39	11/4/20 4:39 PM	-16	38.1
A	40	A40	11/3/20 3:54 PM	9	38.1
A	41	A41	11/3/20 11:49 PM	1	No data
A	42	A42	11/2/20 11:33 PM	25	38.5
A	43	A43	11/4/20 4:29 PM	-15	38.2
A	44	A44	11/3/20 3:44 PM	9	38.0
A	45	A45	11/3/20 11:40 PM	1	No data
A	46	A46	11/4/20 11:51 PM	-23	38.0
A	47	A47	11/4/20 4:20 PM	-15	38.2
A	48	A48	11/3/20 5:27 PM	8	38.1
A	49	A49	11/3/20 11:33 PM	1	No data
A	50	A50	11/4/20 11:42 PM	-23	38.1

38.2
Wet Tons

8/13/2020 19:00

Run Date Time
3 11/3/2020 17:00 - 18:22

8/13/2020 21:00

BAT	OVEN	REF	CHARGED	CUR HRS	CUR WGT
A	35	A35	10/29/20 4:02 PM	129	empty
A	36	A36	11/3/20 4:03 PM	9	38.1
A	37	A37	11/3/20 11:57 PM	1	No data
A	38	A38	11/2/20 11:46 PM	25	38.5
A	39	A39	11/4/20 4:39 PM	-16	38.1
A	40	A40	11/3/20 3:54 PM	9	38.1
A	41	A41	11/3/20 11:49 PM	1	No data
A	42	A42	11/2/20 11:33 PM	25	38.5
A	43	A43	11/4/20 4:29 PM	-15	38.2
A	44	A44	11/3/20 3:44 PM	9	38.0
A	45	A45	11/3/20 11:40 PM	1	No data
A	46	A46	11/4/20 11:51 PM	-23	38.0
A	47	A47	11/4/20 4:20 PM	-15	38.2
A	48	A48	11/3/20 5:27 PM	8	38.1
A	49	A49	11/3/20 11:33 PM	1	No data
A	50	A50	11/4/20 11:42 PM	-23	38.1

38.2

Wet Tons

Run Date Time
4 11/4/2020 7:45 - 9:07

8/14/2020 1:20

BAT	OVEN	REF	CHARGED	CUR BRS	CUR WGT
A	35	A35	10/29/20 4:02 PM	129	empty
A	36	A36	11/3/20 4:03 PM	9	38.1
A	37	A37	11/3/20 11:57 PM	1	38.1
A	38	A38	11/2/20 11:46 PM	25	38.5
A	39	A39	11/4/20 4:39 PM	-16	38.1
A	40	A40	11/3/20 3:54 PM	9	38.1
A	41	A41	11/3/20 11:49 PM	1	38.0
A	42	A42	11/2/20 11:33 PM	25	38.5
A	43	A43	11/4/20 4:29 PM	-15	38.2
A	44	A44	11/3/20 3:44 PM	9	38.0
A	45	A45	11/3/20 11:40 PM	1	38.0
A	46	A46	11/4/20 11:51 PM	-23	38.0
A	47	A47	11/4/20 4:20 PM	-15	38.2
A	48	A48	11/3/20 5:27 PM	8	38.1
A	49	A49	11/3/20 11:33 PM	1	38.0
A	50	A50	11/4/20 11:42 PM	-23	38.1

38.1
Wet Tons

A Battery at 1 AM on 11/4/2020

BATTERY	INDEX	OVEN	CHARGE TIME	Elapsed Time on OVENS (HRS)	RUN	BLOCK TIME	ACT. CHARGE WEIGHT	
A	35	A35	10/29/2020 16:02	129	67-3	HOLD	39.10	(Empty) OOS for Oven Repair
A	36	A36	11/3/2020 16:03	9	64-4	2:30 PM	38.10	
A	37	A37	11/3/2020 23:57	1	65-1	10:30 PM	38.10	
A	38	A38	11/2/2020 23:46	25	66-2	HOLD	38.50	
A	39	A39	11/4/2020 16:39	-16	67-3	HOLD	38.10	
A	40	A40	11/3/2020 15:54	9	64-4	2:30 PM	38.10	
A	41	A41	11/3/2020 23:49	1	65-1	10:30 PM	38.00	
A	42	A42	11/2/2020 23:33	25	66-2	HOLD	38.50	
A	43	A43	11/4/2020 16:29	-15	67-3	HOLD	38.20	
A	44	A44	11/3/2020 15:44	9	64-4	2:30 PM	38.00	
A	45	A45	11/3/2020 23:40	1	65-1	10:30 PM	38.00	
A	46	A46	11/4/2020 23:51	-23	66-2	HOLD	38.00	
A	47	A47	11/4/2020 16:20	-15	67-3	HOLD	38.20	
A	48	A48	11/3/2020 17:27	8	64-4	2:30 PM	38.10	
A	49	A49	11/3/2020 23:33	1	65-1	10:30 PM	38.00	
A	50	A50	11/4/2020 23:42	-23	66-2	HOLD	38.10	

Stack A-3				
Ovens 35-50				
		Date	Start Time	End Time
Run 1	Coking		12:00	13:20
Run 2	Production	11/3/2020	15:05	16:25
Run 3	Production		17:00	18:22
Run 4	Coking	11/4/2020	7:45	9:07

Appendix B
VENT STACK VISIBLE EMISSIONS FIELD FORMS

Tuesday 11/3/2020

Stack Test

A-3 Boiler Stack - Coking Run

Run 1 13 - Six minute Averager observed

0 - Emissions Noted

A-3 Boiler Stack - Production Run

Run 2 13 - Six minute Averager observed

16.44% Emissions Noted

SEC

Method 9 VE Stack Compliance Inspection Form

Date/Day: 11-3-2020 / Tuesday
 Source: Run-1 A-3 Stack VE
 Observation began: 12:00 Noon
 Observation ended: 13:00
 Observed from: SE
 Distance to Source: 225'
 Direction to Source: NW
 Height of Source: 75' to 100'
 Plume Type: Attached

Emission Color:

Background Color:

Sky Condition:

Wind Speed:

Wind Direction:

Ambient Temperature:

Rel Humidity %

Beginning

End

See Comments

See Comments

BlueBlueClearClear6 mph6 mphSWSW62°62°36%36%

Sheet:

1

of

2

Comments	0	15	30	45				0	15	30	45		Comments
Start 1 st Test	1	0	0	0	0	0	30	0	0	0	0	0	6
Cokmo Run 1	1	0	0	0	0	0	31	0	0	0	0	0	6
0/24 = (0.00)	1	0	0	0	0	0	32	0	0	0	0	0	6
	1	0	0	0	0	0	33	0	0	0	0	0	6
	1	0	0	0	0	0	34	0	0	0	0	0	6
	1	0	0	0	0	0	35	0	0	0	0	0	6
	2	0	0	0	0	0	36	0	0	0	0	0	7
	2	0	0	0	0	0	37	0	0	0	0	0	7
0/24 = (0.00)	2	0	0	0	0	0	38	0	0	0	0	0	7
	2	0	0	0	0	0	39	0	0	0	0	0	7
	2	0	0	0	0	0	40	0	0	0	0	0	7
	2	0	0	0	0	0	41	0	0	0	0	0	7
	3	0	0	0	0	0	42	0	0	0	0	0	8
	3	0	0	0	0	0	43	0	0	0	0	0	8
0/24 = (0.00)	3	0	0	0	0	0	44	0	0	0	0	0	8
	3	0	0	0	0	0	45	0	0	0	0	0	8
	3	0	0	0	0	0	46	0	0	0	0	0	8
	3	0	0	0	0	0	47	0	0	0	0	0	8
	4	0	0	0	0	0	48	0	0	0	0	0	9
	4	0	0	0	0	0	49	0	0	0	0	0	9
0/24 = (0.00)	4	0	0	0	0	0	50	0	0	0	0	0	9
	4	0	0	0	0	0	51	0	0	0	0	0	9
	4	0	0	0	0	0	52	0	0	0	0	0	9
	4	0	0	0	0	0	53	0	0	0	0	0	9
	5	0	0	0	0	0	54	0	0	0	0	0	10
	5	0	0	0	0	0	55	0	0	0	0	0	10
0/24 = (0.00)	5	0	0	0	0	0	56	0	0	0	0	0	10
	5	0	0	0	0	0	57	0	0	0	0	0	10
	5	0	0	0	0	0	58	0	0	0	0	0	10
	5	0	0	0	0	0	59	0	0	0	0	0	10

Observers signature

C. Simon

Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD
 Burning Door: DD
 Start Push: SP
 End Push: EP
 Start Charge: SC
 End Charge: EC

SEC

Method 9 VE Stack Compliance Inspection Form

Date/Day

Source:

Observation began:

Observation ended:

Observed from:

Distance to Source:

Direction to Source

Height of Source

Plume Type:

11-3-2020 Tuesday

A-3 Boiler stack VE

13:00

13:40

SE

250'

NW

25' to 100'

Attached

Emission Color:

Background Color:

Sky Condition:

Wind Speed:

Wind Direction:

Ambient Temperature:

Rel Humidity %

Beginning

End

See Comments

See Comments

Blue

Blue

Clear

Clear

2MPH

2MPH

SW

SW

64°

64°

29%

29%

Sheet:

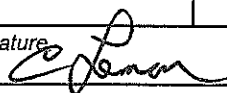
2

of

2

Comments	0	15	30	45				0	15	30	45		Comments
Continue 1 st Run	11	0	0	0	0	0	0	30					
	11	0	0	0	0	0	1	31					
0/24 = (0.00)	11	0	0	0	0	0	2	32					
	11	0	0	0	0	0	3	33					
	11	0	0	0	0	0	4	34					
	11	0	0	0	0	0	5	35					
	12	0	0	0	0	0	6	36					
	12	0	0	0	0	0	7	37					
0/24 = (0.00)	12	0	0	0	0	0	8	38					
	12	0	0	0	0	0	9	39					
	12	0	0	0	0	0	10	40					
	12	0	0	0	0	0	11	41					
	13	0	0	0	0	0	12	42					
	13	0	0	0	0	0	13	43					
0/24 = (0.00)	13	0	0	0	0	0	14	44					
	13	0	0	0	0	0	15	45					
	13	0	0	0	0	0	16	46					
	13	0	0	0	0	0	17	47					
	14	0	0	0	0	0	18	48					
Step Run - 1	14	0	0	0	0	0	19	49					
							20	50					
							21	51					
							22	52					
							23	53					
							24	54					
							25	55					
							26	56					
							27	57					
							28	58					
							29	59					

Observers signature



Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD

Burning Door: DD

Start Push: SP

End Push: EP

Start Charge: SC

End Charge: EC

USEPA METHOD 9 Criteria Determination

Date

11-3-2020 Tuesday

Source Data

Observer

C. Linn

A-3 stack Coking Test

Time Begin

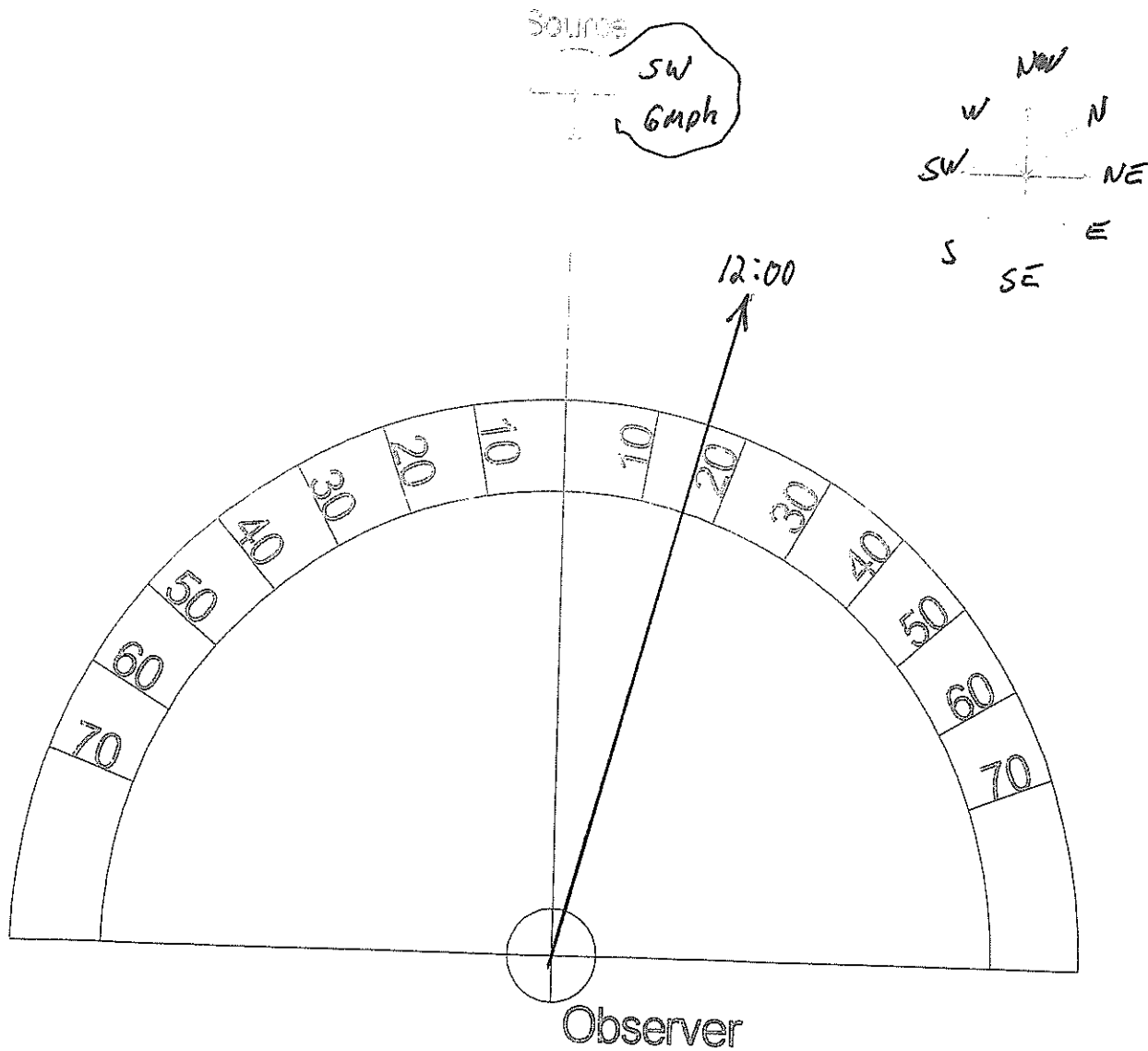
12:00 Noon

Run - 1

Time End

13:20

WFO



Sun Visible During Inspection

Yes ☒

No ☐

SEC

SEC

Method 9 VE Stack Compliance Inspection Form

Date/Day: 11-3-2020 Tuesday
 Source: Run2 A-3 Boiler Stack VE
 Observation began: 1505
 Observation ended: 1600
 Observed from: SE
 Distance to Source: 250'
 Direction to Source: NE
 Height of Source: 75'
 Plume Type: Attached

Emission Color:

Background Color:

Sky Condition:

Wind Speed:

Wind Direction:

Ambient Temperature:

Rel Humidity %

Beginning

See Comments

End

See Comments

BlueBlueClearClear8MPH8MPHSWSW64°64°29%29%

Sheet:

1

of

2

Comments	0	15	30	45			0	15	30	45		Comments
						0 30	0	0	0	0	0	5
						1 31	0	0	0	0	0	5
						2 32	0	0	0	0	0	5
						3 33	0	0	0	0	0	5
Production						4 34	0	0	0	0	0	5
start Run-1	1	0	0	0	0	5 35	0	0	0	0	0	6
	1	0	0	0	0	6 36	0	0	0	0	0	6
0/24 = 0.00	1	0	0	0	0	7 37	0	0	0	0	0	6
	1	0	0	0	0	8 38	0	0	0	0	0	6
	1	0	0	0	0	9 39	0	0	0	0	0	6
	1	0	0	0	0	10 40	0	0	0	0	0	6
	2	0	0	0	0	11 41	0	0	0	0	0	7
	2	0	0	0	0	12 42	0	0	0	0	0	7
0/24 = 0.00	2	0	0	0	0	13 43	0	0	0	0	0	7
	2	0	0	0	0	14 44	0	0	0	0	0	7
	2	0	0	0	0	15 45	0	0	0	0	0	7
	2	0	0	0	0	16 46	0	0	0	0	0	7
	3	0	0	0	0	17 47	0	0	0	0	0	8
	3	0	0	0	0	18 48	0	0	0	15	15	8
0/24 = 0.00	3	0	0	0	0	19 49	20	25	25	30	100	8
	3	0	0	0	0	20 50	30	30	30	30	120	8
	3	0	0	0	0	21 51	30	30	30	30	120	8
	3	0	0	0	0	22 52	30	35	30	30	125	8
	4	0	0	0	0	23 53	30	30	30	30	120	9
0/24 = 0.00	4	0	0	0	0	24 54	30	30	30	30	120	9
	4	0	0	0	0	25 55	30	30	25	35	110	9
	4	0	0	0	0	26 56	30	25	25	20	100	9
	4	0	0	0	0	27 57	20	20	20	25	85	9
	4	0	0	0	0	28 58	35	35	35	35	140	9
	5	0	0	0	0	29 59	45	50	45	45	185	10

Observers signature: E. Leman

Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD
 Burning Door: DD
 Start Push: SP
 End Push: EP
 Start Charge: SC
 End Charge: EC

SEC

Method 9 VE Stack Compliance Inspection Form

Date/Day: 11-3-2020 Tuesday
 Source: Rm 2 A-3 Boiler Stack VE
 Observation began: 1600
 Observation ended: 1627
 Observed from: SW
 Distance to Source: 250'
 Direction to Source: NE
 Height of Source: 25'
 Plume Type: Attached

Emission Color:
 Background Color:
 Sky Condition:
 Wind Speed:
 Wind Direction:
 Ambient Temperature:
 Rel Humidity %

Beginning	End
See Comments	See Comments
Blue	Blue
Clear	Clear
10 MPH	10 MPH
SSW	SSW
68°	68°
30%	30%

Sheet: 2 of 2

Comments	0	15	30	45				0	15	30	45		Comments
	10	50	50	50	50	200	0	30					
	10	50	50	55	55	210	1	31					
$1220/24 = 50.83$	10	55	55	55	50	215	2	32					
	10	55	55	55	55	220	3	33					
	10	50	45	50	45	190	4	34					
	11	45	45	50	50	190	5	35					
	11	45	45	45	50	185	6	36					
$960/24 = 40.00$	11	50	55	55	55	215	7	37					
	11	50	50	50	50	200	8	38					
	11	55	55	50	50	210	9	39					
	11	45	45	40	40	170	10	40					
	12	40	45	40	40	165	11	41					
	12	45	45	45	45	180	12	42					
$1120/24 = 47.08$	12	45	45	50	40	180	13	43					
	12	45	40	40	45	170	14	44					
	12	40	40	45	40	165	15	45					
	12	45	45	40	40	170	16	46					
	13	45	45	35	35	160	17	47					
	13	30	30	35	35	130	18	48					
$665/24 = 27.71$	13	30	30	25	30	115	19	49					
	13	25	25	30	25	105	20	50					
	13	25	20	20	20	85	21	51					
	13	30	20	15	15	70	22	52					
	14	15	15	15	15	60	23	53					
$245/16 = 15.31$	14	15	15	15	15	60	24	54					
	14	15	15	15	20	65	25	55					
End RUN	14	15	15	15	15	60	26	56					
							27	57					
							28	58					
							29	59					

Observers signature: [Signature]

Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD
 Burning Door: DD
 Start Push: SP
 End Push: EP
 Start Charge: SC
 End Charge: EC

USEPA METHOD 9
Criteria Determination

Date

11-3-2020 Tuesday

Analysis Date

Observer

C. Linn

A-3 Boiler Stack

Time Begin

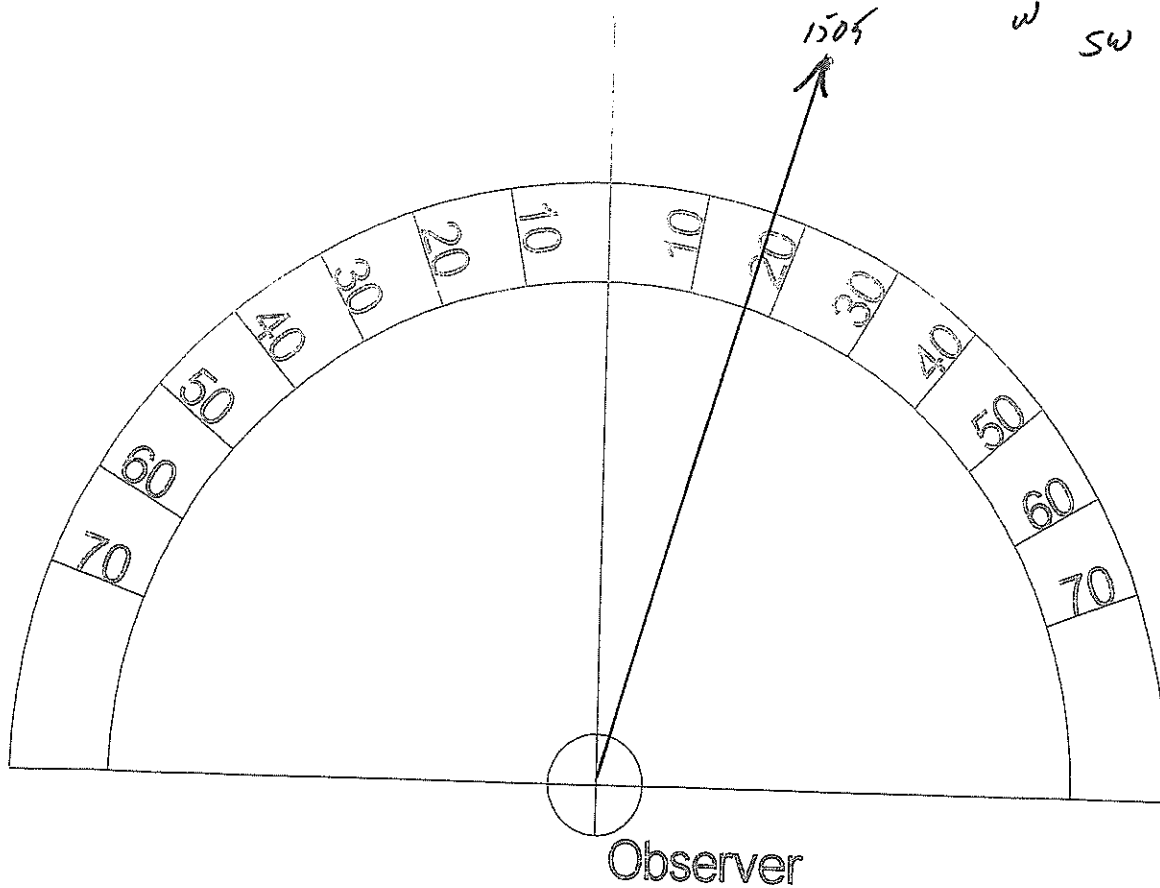
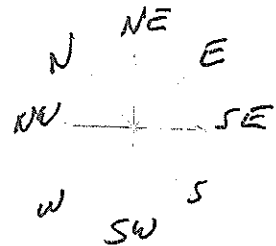
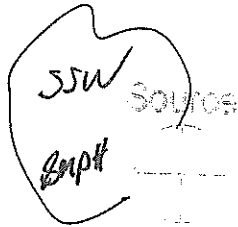
1505

Production Run Run 2

Time End

1627

WFO



Sun Visible During Inspection

Yes ☒

No ☐

WEDNESDAY 11-4-2020

STACK TEST

A-3 Boiler / VENT STACK

13 SIX minute AVG5 OBSERVED

- EMISSIONS NOTED

SEC

Method 9 VE Inspection Form

Date/Day

11-4-2020 Wednesday

Source:

A-3 Boiler SNCK

Observation began:

0745

Observation ended:

0800

Observed from:

SE of source

Distance to Source:

250 FT

Direction to Source:

NW

Height of Source

90 FT

Plume Type:

Attached

Emission Color:

Background Color:

Sky Condition:

Wind Speed:

Wind Direction:

Ambient Temperature:

Rel Humidity %

Beginning

See Comments

End

See Comments

BLUE

BLUE

CLEAR

CLEAR

12

13

SOUTH

SOUTH

50°

52°

71%

67%

Sheet:

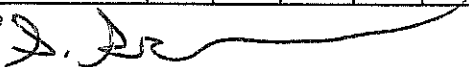
1

of

3

Comments	0	15	30	45				0	15	30	45		Comments
						0	30						
						1	31						
						2	32						
						3	33						
						4	34						
						5	35						
						6	36						
						7	37						
						8	38						
						9	39						
						10	40						
						11	41						
						12	42						
						13	43						
						14	44						COKING RUN TEST #2
						15	45	0	0	0	0		1
						16	46	0	0	0	0		1
						17	47	0	0	0	0		0/24 = 0.00
						18	48	0	0	0	0		1
						19	49	0	0	0	0		1
						20	50	0	0	0	0		1
						21	51	0	0	0	0		2
						22	52	0	0	0	0		2
						23	53	0	0	0	0		2 0/24 = 0.00
						24	54	0	0	0	0		2
						25	55	0	0	0	0		2
						26	56	0	0	0	0		2
						27	57	0	0	0	0		3
						28	58	0	0	0	0		3
						29	59	0	0	0	0		3

Observers signature



Additional info. (include steam dissipation point if applicable)

Open Door: OD

Burning Door: 00

Start Push: SP

End Push: EP

Start Charge: SC

End Charge: EC

SEC

Method 9 VE Inspection Form

Date/Day

11-4-2020 / Wednesday

Source:

A-3 Boiler / VENT STACK

Observation began:

0800

Observation ended:

0900

Observed from:

SE OF SOURCE

Distance to Source:

150 FT

Direction to Source

NW

Height of Source

90 FT

Plume Type:

Attached

Emission Color:

Background Color:

Sky Condition:

Wind Speed:

Wind Direction:

Ambient Temperature:

Rel Humidity %

Beginning

See Comments

End

See Comments

BLUE

BLUE

CLEAR

CLEAR

13

13

SOUTH

S-SW

52°

57°

67%

58%

Sheet:

2

of

3

Comments	0	15	30	45			0	15	30	45		Comments
	3	0	0	0	0	0	30	0	0	0	0	8
0/24 = 0.00	3	0	0	0	0	1	31	0	0	0	0	8 0/24 = 0.00
	3	0	0	0	0	2	32	0	0	0	0	8
	4	0	0	0	0	3	33	0	0	0	0	9
	4	0	0	0	0	4	34	0	0	0	0	9
0/24 = 0.00	4	0	0	0	0	5	35	0	0	0	0	9 0/24 = 0.00
	4	0	0	0	0	6	36	0	0	0	0	9
	4	0	0	0	0	7	37	0	0	0	0	9
	4	0	0	0	0	8	38	0	0	0	0	9
	5	0	0	0	0	9	39	0	0	0	0	10
	5	0	0	0	0	10	40	0	0	0	0	10
0/24 = 0.00	5	0	0	0	0	11	41	0	0	0	0	10 0/24 = 0.00
	5	0	0	0	0	12	42	0	0	0	0	10
	5	0	0	0	0	13	43	0	0	0	0	10
	5	0	0	0	0	14	44	0	0	0	0	10
	6	0	0	0	0	15	45	0	0	0	0	11
	6	0	0	0	0	16	46	0	0	0	0	11
0/24 = 0.00	6	0	0	0	0	17	47	0	0	0	0	11 0/24 = 0.00
	6	0	0	0	0	18	48	0	0	0	0	11
	6	0	0	0	0	19	49	0	0	0	0	11
	6	0	0	0	0	20	50	0	0	0	0	11
	7	0	0	0	0	21	51	0	0	0	0	12
	7	0	0	0	0	22	52	0	0	0	0	12
0/24 = 0.00	7	0	0	0	0	23	53	0	0	0	0	12 0/24 = 0.00
	7	0	0	0	0	24	54	0	0	0	0	12
	7	0	0	0	0	25	55	0	0	0	0	12
	7	0	0	0	0	26	56	0	0	0	0	12
	8	0	0	0	0	27	57	0	0	0	0	13
	8	0	0	0	0	28	58	0	0	0	0	13
	8	0	0	0	0	29	59	0	0	0	0	13

Observers signature: *D. De*

Additional info. (include steam dissipation point if applicable)

Open Door: OD

Burning Door: DD

Start Push: SP

End Push: EP

Start Charge: SC

End Charge: EC

SEC

Method 9 VE Inspection Form

Date/Day: 11-4-2020 WEDNESDAY
 Source: A-3 Boiler/VENT STACK
 Observation began: 0900
 Observation ended: 0908
 Observed from: SE of source
 Distance to Source: 250 FT
 Direction to Source: NW
 Height of Source: 90 FT
 Plume Type: Attached

Emission Color:
 Background Color:
 Sky Condition:
 Wind Speed:
 Wind Direction:
 Ambient Temperature:
 Rel Humidity %

Beginning See Comments	End See Comments
Blue	Blue
CLEAR	CLEAR
13	13
S-SW	S-SW
57°	57°
58%	57%

Sheet: 3 of 3

Comments	0	15	30	45				0	15	30	45		Comments
	13	0	0	0	0		0	30					
0124 = (0.00)	13	0	0	0	0		1	31					
	13	0	0	0	0		2	32					
	14	0	0	0	0		3	33					
0120 = (0.00)	14	0	0	0	0		4	34					
	14	0	0	0	0		5	35					
	14	0	0	0	0		6	36					
STOP	14	0	0	0	0		7	37					
							8	38					
							9	39					
							10	40					
							11	41					
							12	42					
							13	43					
							14	44					
							15	45					
							16	46					
							17	47					
							18	48					
							19	49					
							20	50					
							21	51					
							22	52					
							23	53					
							24	54					
							25	55					
							26	56					
							27	57					
							28	58					
							29	59					

Observers signature

Additional info. (include steam dissipation point if applicable)

Open Door: OD
 Burning Door: DD
 Start Push: SP
 End Push: EP
 Start Charge: SC
 End Charge: EC

USEPA METHOD 9 Criteria Determination

Date: 11-4-2020 - Wednesday

Source Data:

Observer: S. SCHLOSSER

STACK TEST - A-BATTERY

Time Begin: 0745

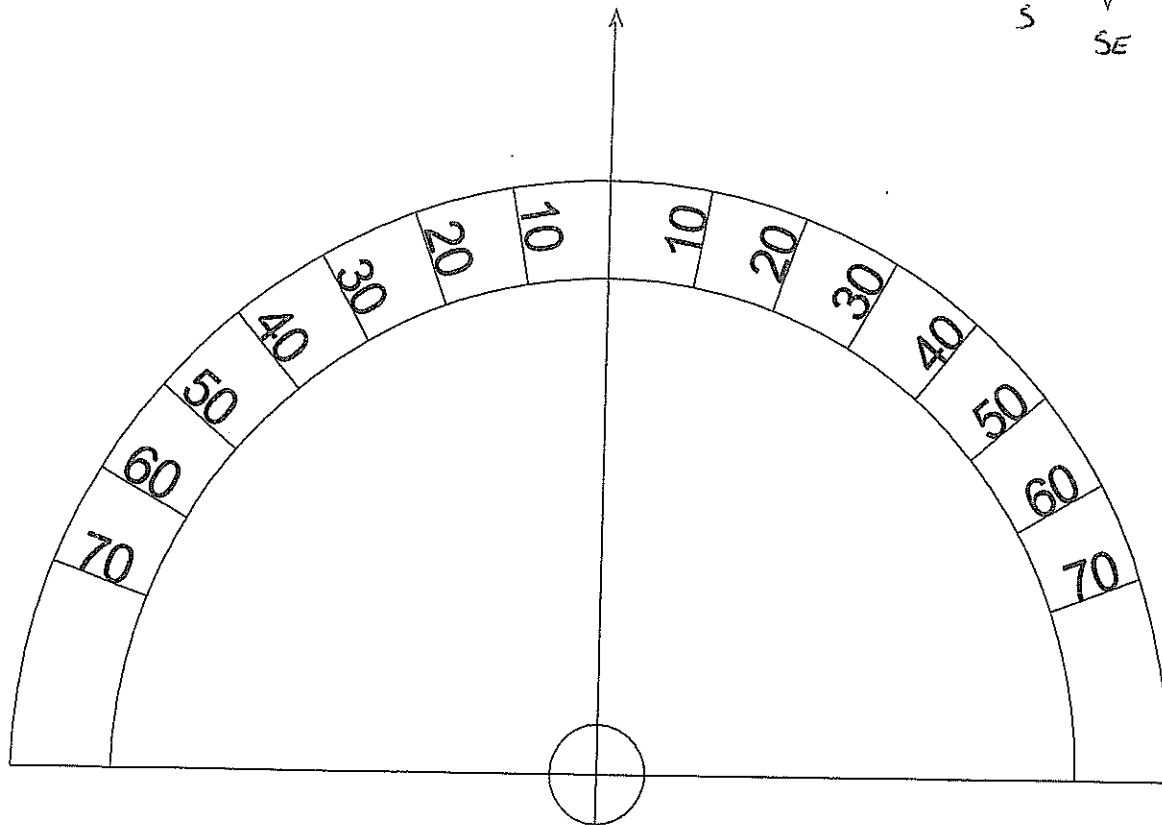
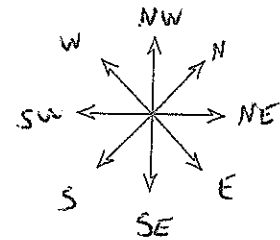
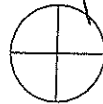
A-3 Boiler / VENT STACK

Time End: 0908

IHO

Source

S-SW
12-13
mph



Observer

Sun Visible During Inspection Yes ☒ No ☐

SEC

Oven Vent Run 2 VE Observation Sheet

**EPA Method 9
Observation Record**

Facility Suncoke Indiana Harbor					Run 2				
Unit Oven Vent A-3					Date 11/3/2020				
EST		15:05			16:27		Page of		

Min.	Seconds				Comments	Min.	Seconds				Comments
	0	15	30	45			0	15	30	45	
1	0	0	0	0		31	0	0	0	0	
2	0	0	0	0		32	0	0	0	0	
3	0	0	0	0		33	0	0	0	0	
4	0	0	0	0		34	0	0	0	0	
5	0	0	0	0		35	0	0	0	0	
6	0	0	0	0		36	0	0	0	0	
7	0	0	0	0		37	0	0	0	0	
8	0	0	0	0		38	0	0	0	0	
9	0	0	0	0		39	0	0	0	0	
10	0	0	0	0		40	0	0	0	0	
11	0	0	0	0		41	0	0	0	0	
12	0	0	0	0		42	0	0	0	0	
13	0	0	0	0		43	0	0	0	0	
14	0	0	0	0		44	0	0	0	15	
15	0	0	0	0		45	20	25	25	30	
16	0	0	0	0		46	30	30	30	30	
17	0	0	0	0		47	30	30	30	30	
18	0	0	0	0		48	30	35	30	30	
19	0	0	0	0		49	30	30	30	30	
20	0	0	0	0		50	30	30	30	30	
21	0	0	0	0		51	30	30	25	25	
22	0	0	0	0		52	30	25	25	20	
23	0	0	0	0		53	20	20	20	25	
24	0	0	0	0		54	35	35	35	35	
25	0	0	0	0		55	45	50	45	45	
26	0	0	0	0		56	50	50	50	50	
27	0	0	0	0		57	50	50	55	55	
28	0	0	0	0		58	55	55	55	50	
29	0	0	0	0		59	55	55	55	55	
30	0	0	0	0		60	50	45	50	45	
						61	45	45	50	50	
						62	45	45	45	50	
						63	50	55	55	55	
						64	50	50	50	50	
						65	55	55	50	50	
						66	45	45	40	40	
						67	40	45	40	40	
						68	45	45	45	45	
						69	45	45	50	40	
						70	45	40	40	45	
						71	40	40	45	40	
						72	45	45	40	40	
						73	45	45	35	35	
						74	30	30	35	35	
						75	30	30	25	30	
						76	25	25	30	25	
						77	25	20	20	20	
						78	20	20	15	15	
						79	15	15	15	15	
						80	15	15	15	15	
						81	15	15	15	20	
						82	15	15	15	15	

Oven Vent Run 2 VE Observation Averages Sheet

EPA Method 9

6-Minute Observation Averages

Facility	Suncoke Indiana Harbor
Unit	Oven Vent A-3
Start Time	3:05:00 PM

End Time	4:27:00 PM
----------	------------

Run	2
Date	11/3/2020

Min.	Seconds				Comments	Min.	Seconds				Comments	Min.	Seconds				Comments
	0	15	30	45			0	15	30	45			0	15	30	45	
1	0.0					31	0.0					61	48.8				
2						32						62					
3						33						63					
4						34						64					
5						35						65					
6						36						66					
7	0.0					37	0.0					67	42.9				
8						38						68					
9						39						69					
10						40						70					
11						41						71					
12						42						72					
13	0.0					43	20.0					73	27.7				
14						44						74					
15						45						75					
16						46						76					
17						47						77					
18						48						78					
19	0.0					49	28.1					79	N/A				
20						50						80					
21						51						81					
22						52						82					
23						53											
24						54											
25	0.0					55	50.8										
26						56											
27						57											
28						58											
29						59											
30						60											

Maximum 6-Minute Average 50.8

Overall Average for Run 16.0

Appendix C
PCM VISIBLE EMISSIONS FIELD FORMS

wed. 11/4/2020

Stack Test

A/B Bag House Stack

10 - Six minute AVER Observed Run #1

0 - Emissions Noted

SEC

Run #1

Method 9 VE Stack Compliance Inspection Form

Date/Day: 11-4-2020 Wed
 Source: ALB Bag House Stack
 Observation began: 1546
 Observation ended: 16:00
 Observed from: SE
 Distance to Source: 75'
 Direction to Source: NW
 Height of Source: 30'
 Plume Type: ✓ Attached

Emission Color:
 Background Color:
 Sky Condition:
 Wind Speed:
 Wind Direction:
 Ambient Temperature:
 Rel Humidity %

Beginning See Comments	End See Comments
Blue	Blue
Clear	Clear
13MPH	13MPH
SSW	SSW
73°	73°
30%	30%

Sheet: 1 of 2

Comments	0	15	30	45				0	15	30	45		Comments
						0	30						
						1	31						
						2	32						
						3	33						
						4	34						
						5	35						
						6	36						
						7	37						
						8	38						
						9	39						
						10	40						
						11	41						
						12	42						
						13	43						
						14	44						
						15	45						
						16	46	0	0	0	0	0	Start Run
						17	47	0	0	0	0	0	1
						18	48	0	0	0	0	0	1 0/24 = 0.00
						19	49	0	0	0	0	0	1
						20	50	0	0	0	0	0	1
						21	51	0	0	0	0	0	1
						22	52	0	0	0	0	0	2
						23	53	0	0	0	0	0	2
						24	54	0	0	0	0	0	2 0/24 = 0.00
						25	55	0	0	0	0	0	2
						26	56	0	0	0	0	0	2
						27	57	0	0	0	0	0	2
						28	58	0	0	0	0	0	3
						29	59	0	0	0	0	0	3

Observers signature: [Signature]

Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD
 Burning Door: DD
 Start Push: SP
 End Push: EP
 Start Charge: SC
 End Charge: EC

Rva #1

SEC Method 9 VE Stack Compliance Inspection Form

Date/Day	11/4/2020 Wed.	Emission Color:	Beginning	End
Source:	A/B Bas House Stack	Background Color:	See Comments	See Comments
Observation began:	1600	Sky Condition:	Blue	Blue
Opservation ended:	1648	Wind Speed:	Clear	Clear
Observed from:	SE	Wind Direction:	13 MPH	13 MPH
Distance to Source:	25'	Ambient Temperature:	55W	55W
Direction to Source	NW	Rel Humidity %	73°	73°
Height of Source	30'		30%	30%
Plume Type:	Attached	Sheet:	2	of 2

Comments	0	15	30	45				0	15	30	45		Comments
	3	0	0	0	0	0	30	0	0	0	0	0	
0/24 = (0.00)	3	0	0	0	0	1	31	0	0	0	0	0	0/24 = (0.00)
	3	0	0	0	0	2	32	0	0	0	0	0	
	3	0	0	0	0	3	33	0	0	0	0	0	
	4	0	0	0	0	4	34	0	0	0	0	0	
	4	0	0	0	0	5	35	0	0	0	0	0	
0/24 = (0.00)	4	0	0	0	0	6	36	0	0	0	0	0	0/24 = (0.00)
	4	0	0	0	0	7	37	0	0	0	0	0	
	4	0	0	0	0	8	38	0	0	0	0	0	
	4	0	0	0	0	9	39	0	0	0	0	0	
	5	0	0	0	0	10	40	0	0	0	0	0	
0/24 = (0.00)	5	0	0	0	0	11	41	0	0	0	0	0	0/24 = (0.00)
	5	0	0	0	0	12	42	0	0	0	0	0	
	5	0	0	0	0	13	43	0	0	0	0	0	
	5	0	0	0	0	14	44	0	0	0	0	0	
	5	0	0	0	0	15	45	0	0	0	0	0	
	6	0	0	0	0	16	46	0	0	0	0	0	
0/24 = (0.00)	6	0	0	0	0	17	47	0	0	0	0	0	0/24 = (0.00)
	6	0	0	0	0	18	48	0	0	0	0	0	
	6	0	0	0	0	19	49						
	6	0	0	0	0	20	50						
	6	0	0	0	0	21	51						
	7	0	0	0	0	22	52						
	7	0	0	0	0	23	53						
0/24 = (0.00)	7	0	0	0	0	24	54						0/24 = (0.00)
	7	0	0	0	0	25	55						
	7	0	0	0	0	26	56						
	7	0	0	0	0	27	57						
	8	0	0	0	0	28	58						
	8	0	0	0	0	29	59						

Observers signature: *C. Kemon* Confidential Attorney / Client Privilege

Additional info. (include steam dissipation point if applicable)

Open Door: OD

Burning Door: DD

Start Push: SP

End Push: EP

Start Charge: SC

End Charge: EC

USEPA METHOD 5 Criteria Determination

Date 11-4-2020 Wed

Source Data

Observer C. Loman

A/B Bayhouse Stack

Time Begin 15:46

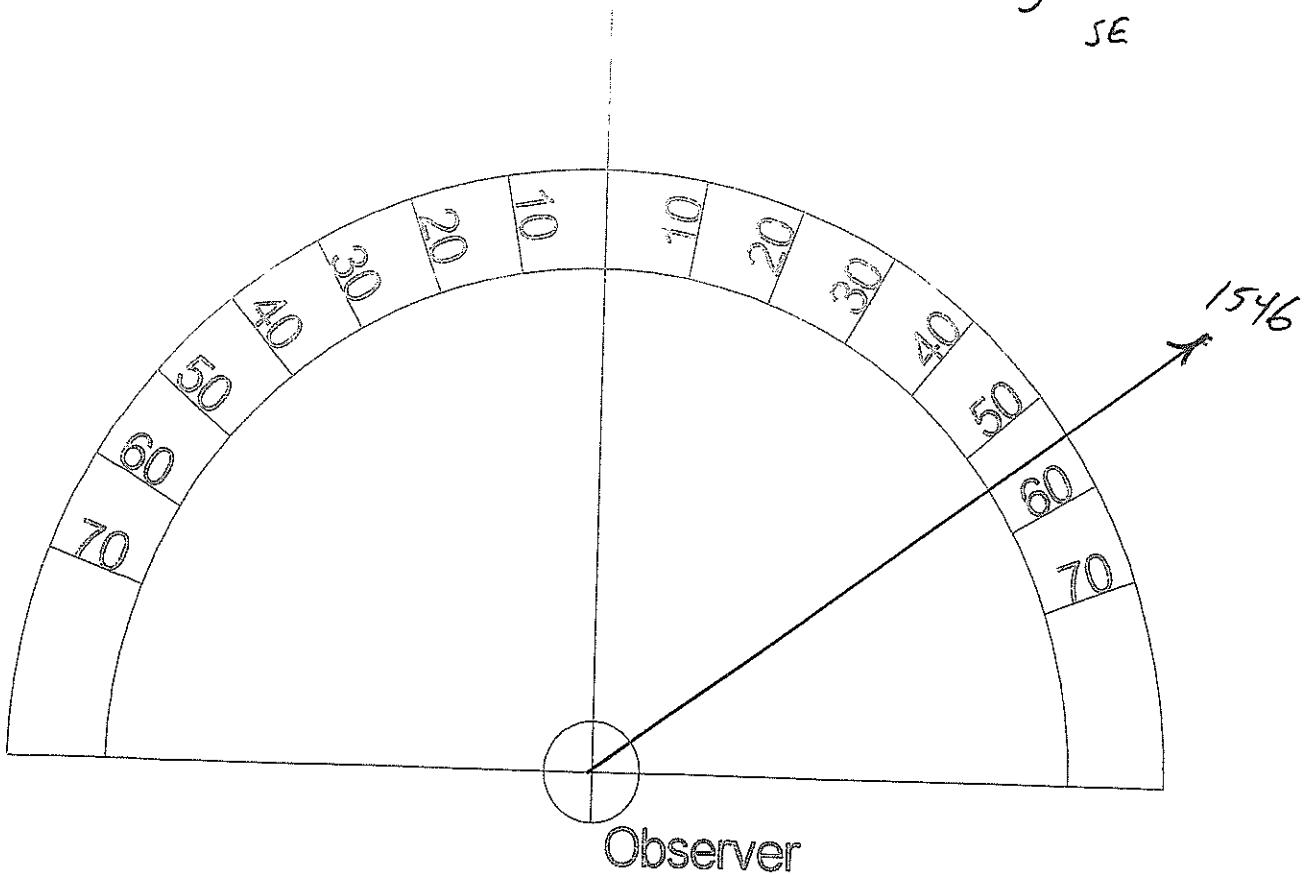
Run #1

Time End 16:48

Wind

Source
SSW
10 mph

W NW N
SW NE
S SE E



Sun Visible During Inspection

Yes ☒ No ☐

Appendix D
VENT STACK EMISSION CALCULATIONS AND DATA



Emissions Test Run Summary

Facility: Suncoke/Indiana Harbor Location: HRCC Oven Vent A-3 Condition: Full Load Sample Type: Method 5/202					
Was the run used?	Yes	Yes	Yes	Yes	
Run Number:	1	2	3	4	
Date:	3-Nov-20	3-Nov-20	3-Nov-20	4-Nov-20	Average
Total Sampling Time (min)	70.0	72.0	72.0	72.0	71.5
Corrected Barometric Pressure (in Hg)	29.44	29.36	29.33	29.38	29.38
Absolute Stack Pressure (in Hg)	29.44	29.35	29.32	29.37	29.37
Stack Static Pressure (in H ₂ O)	-0.06	-0.08	-0.15	-0.13	-0.11
Average Stack Temperature (°F)	1468.8	1474.8	1535.8	1492.2	1492.9
Stack Area (sq in)	7238	7238	7238	7238	7238
Actual Meter Volume (cu ft)	33.962	36.818	39.399	36.858	36.759
Average Meter Pressure (in H ₂ O)	0.83	0.93	1.11	1.06	0.98
Average Meter Temperature (°F)	73.6	74.3	68.9	59.0	69.0
Moisture Collected (g)	79.7	89.6	106.9	95.8	93.0
Carbon Dioxide Concentration (%V)	7.1	6.8	6.9	6.9	6.9
Oxygen Concentration (%V)	9.9	10.2	10.2	10.3	10.1
Nitrogen Concentration (%V)	83.0	83.0	82.9	82.9	82.9
Dry Gas Meter Factor (γ _d)	1.0090	1.0090	1.0090	1.0090	1.0090
Nozzle Diameter (in)	0.375	0.375	0.375	0.375	0.375
Pitot Constant	0.84	0.84	0.84	0.84	0.84
Average Sampling Rate (dscfm)	0.478	0.501	0.542	0.517	0.510
Standard Metered Volume (dscf)	33.435	36.106	39.010	37.247	36.449
Standard Metered Volume (dscm)	0.947	1.022	1.105	1.055	1.032
Stack Moisture (%V)	10.10	10.48	11.44	10.82	10.71
Saturated Moisture (%V)	101.6	101.9	102.1	101.9	101.9
Mole Fraction Dry Stack Gas	0.899	0.895	0.886	0.892	0.893
Dry Molecular Weight	29.53	29.50	29.51	29.51	29.51
Wet Molecular Weight	28.37	28.29	28.19	28.27	28.28
Average SQRT of Delta P	0.400	0.414	0.453	0.437	0.426
Stack Gas Velocity (fps)	43.69	45.34	50.52	48.12	46.92
Stack Gas Velocity (mpm)	13.3	13.8	15.4	14.7	14.3
Volumetric Flow Rate (acfm)	131,781	136,740	152,375	145,133	141,507
Volumetric Flow Rate (acmm)	3,732	3,872	4,315	4,110	4,007
Volumetric Flow Rate (dscfm)	31,905	32,775	34,983	34,365	33,507
Volumetric Flow Rate (dscmm)	904	928	991	973	949
Percent Isokinetic	98.3	100.5	101.7	98.8	99.8
Post Test Meter QA (γ _{qa})	0.9999	1.0059	1.0256	1.0525	1.0210

Run Used: Yes

Enter data in unshaded areas.

Sample Type	Method 5/202	Date	11/3/2020
Client/Plant	Suncoke/Indiana Harbor	Operator	WL/SJ
Project Number	60644323.03	Run Number	1
Sampling Location	HRCC Oven Vent A-3	K Factor	floating
Condition	Full Load	Meter ΔH_{g}	1.9640
Meter Box Number	SC-M1551	Pitot Constant	0.84
Meter Factor (γ_d)	1.0090	Port Height (ft)	0
Minutes per Point	2.5	Static Pressure (Ps)	-0.06
Barometric Pressure	29.44	Stack Geometry (R or C)?	C
O2/CO2 Method	3A	Stack Diameter (in)	96.0
		Stack Width (If Rectangle)	
		Nozzle ID 1 (in)	0.374
		Nozzle ID 2 (in)	0.375
		Nozzle ID 3 (in)	0.375
		Nozzle ID (in)	0.375

CO2 Percen	O2 Percent	N2 Percent
Replicate 1	7.100	9.900
Replicate 2		
Replicate 3		
Average	7.1	9.9

Impinger Weights (g)		
	Initial	Final
Impinger 1	491.2	551.5
Impinger 2	661.4	661.9
Impinger 3	760.3	765.4
Impinger 4	955.7	969.5
Impinger 5		
Impinger 6		
Impinger 7		
Impinger 8		
Moisture Collected (g)		79.7

Saturated Percent Moisture	101.65	Standard
Calculated Percent Moisture	10.10	Volume (dscf)
Isokinetic %	98.3	33.4

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft ³)	Velocity Head (ΔP) (in H2O)	Orifice Pressure Diff (ΔH) (in H2O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
A1	0	12:00:00	224.605	0.22	1.13	1491	71
A2	2.5	12:02:30	225.940	0.21	1.08	1494	72
A3	5	12:05:00	227.300	0.19	0.98	1488	71
A4	7.5	12:07:30	228.600	0.14	0.72	1474	71
A5	10	12:10:00	229.770	0.10	0.51	1420	71
A6	12.5	12:12:30	230.740	0.10	0.51	1434	72
STOP	15	12:15:00	231.696				
B1	15	12:18:00	231.696	0.21	1.08	1456	72
B2	17.5	12:20:30	233.040	0.19	0.98	1478	72
B3	20	12:23:00	234.360	0.15	0.76	1468	72
B4	22.5	12:25:30	235.560	0.13	0.66	1456	72
B5	25	12:28:00	236.690	0.10	0.51	1468	73
B6	27.5	12:30:30	237.670	0.10	0.51	1461	73
STOP	30	12:33:00	238.635				
C1	30	12:36:00	238.635	0.22	1.12	1476	73
C2	32.5	12:38:30	239.990	0.20	1.02	1484	74
C3	35	12:41:00	241.360	0.18	0.91	1477	74
C4	37.5	12:43:30	242.670	0.15	0.76	1470	74
C5	40	12:46:00	243.860	0.15	0.76	1469	74
C6	42.5	12:48:30	245.160	0.10	0.51	1472	74
STOP	45	12:51:00	246.092				
D1	45	12:55:00	246.092	0.21	1.06	1481	75
D2	47.5	12:57:30	247.400	0.22	1.11	1488	75
D3	50	13:00:00	248.810	0.20	1.01	1484	75
D4	52.5	13:02:30	250.140	0.19	0.96	1478	75
D5	55	13:05:00	251.580	0.15	0.76	1461	75
D6	57.5	13:07:30	252.770	0.15	0.76	1459	76
D6A	60	13:10:00	253.830	0.15	0.76	1459	76
D6B	62.5	13:12:30	255.020	0.15	0.76	1460	76
D6C	65	13:15:00	256.180	0.15	0.76	1459	76
D6D	67.5	13:17:30	257.380	0.15	0.76	1460	76
STOP	70	13:20:00	258.567				

Run Used: Yes
Enter data in unshaded areas.

Sample Type	Method 5/202
Client/Plant	Indiana Harbor
Project Number	60644323.03
Sampling Location	Oven Vent A-3
Condition	Full Load
Meter Box Number	SC-M1551
Meter Factor (γ_d)	1.0090
Minutes per Point	3.0
Barometric Pressure	29.36

O2/CO2 Method 3A		
	CO2 Percent	O2 Percent
Replicate 1	6.800	10.200
Replicate 2		
Replicate 3		
Average	6.8	10.2

Date	11/3/2020
Operator	WL/SJ
Run Number	2
K Factor	floating
Meter ΔH_{θ}	1.9640
Pitot Constant	0.84
Port Height (ft)	0
Static Pressure (Ps)	-0.08
Stack Geometry (R or C)?	C
Stack Diameter (in)	96.0
Stack Width (If Rectangle)	
Nozzle ID 1 (in)	0.374
Nozzle ID 2 (in)	0.375
Nozzle ID 3 (in)	0.375
Nozzle ID (in)	0.375
N2 Percent	83.0

	Impinger Weights (g)		
	Initial	Final	Net
Impinger 1	451.4	523.4	72
Impinger 2	655.8	656.4	0.6
Impinger 3	785.9	784.4	-1.5
Impinger 4	973.2	991.7	18.5
Impinger 5			0
Impinger 6			0
Impinger 7			0
Impinger 8			0
	Moisture Collected (g)		89.6

Saturated Percent Moisture	101.93	Standard
Calculated Percent Moisture	10.48	Volume (dscf)
Isokinetic %	100.5	36.1

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft ³)	Velocity Head (ΔP) (in H ₂ O)	Orifice Pressure Diff (ΔH) (in H ₂ O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
D1	0	15:05:00	259.659	0.24	1.27	1455	74
D2	3	15:08:00	261.400	0.21	1.11	1453	74
D3	6	15:11:00	263.070	0.19	1.01	1450	74
D4	9	15:14:00	264.690	0.17	0.90	1445	74
D5	12	15:17:00	266.250	0.13	0.69	1470	74
D6	15	15:20:00	267.590	0.10	0.54	1444	74
STOP	18	15:23:00	268.850				
C1	18	15:26:00	268.850	0.21	1.12	1444	75
C2	21	15:29:00	270.450	0.19	1.02	1446	74
C3	24	15:32:00	272.090	0.17	0.91	1442	75
C4	27	15:35:00	273.660	0.16	0.86	1435	76
C5	30	15:38:00	275.170	0.12	0.64	1437	75
C6	33	15:41:00	276.500	0.12	0.64	1445	75
STOP	36	15:44:00	277.810				
B1	36	15:46:00	277.810	0.21	1.12	1452	74
B2	39	15:49:00	279.450	0.21	1.12	1464	75
B3	42	15:52:00	281.110	0.17	0.91	1476	75
B4	45	15:55:00	282.680	0.17	0.91	1480	74
B5	48	15:58:00	284.220	0.13	0.69	1454	74
B6	51	16:01:00	285.600	0.13	0.69	1472	74
STOP	54	16:04:00	286.960				
A1	54	16:07:00	286.960	0.24	1.28	1560	74
A2	57	16:10:00	288.670	0.23	1.23	1596	74
A3	60	16:13:00	290.400	0.22	1.18	1601	74
A4	63	16:16:00	292.180	0.20	1.07	1594	74
A5	66	16:19:00	293.760	0.12	0.64	1471	74
A6	69	16:22:00	295.130	0.13	0.69	1410	74
STOP	72	16:25:00	296.477				

Run Used: Yes

Enter data in unshaded areas.

Sample Type	Method 5/202
Client/Plant	coke/Indiana Harbor
Project Number	60644323
Sampling Location	HRCC Oven Vent A-3
Condition	Full Load
Meter Box Number	SC-M1551
Meter Factor (γ _d)	1.0090
Minutes per Point	3.0
Barometric Pressure	29.33

O₂/CO₂ Method 3A

	CO ₂ Percent	O ₂ Percent
Replicate 1	6.900	10.200
Replicate 2		
Replicate 3		
Average	6.9	10.2

Date	11/3/2020
Operator	WL/SJ
Run Number	3
K Factor	5.35
Meter ΔH ₀	1.9640
Pitot Constant	0.84
Port Height (ft)	0
Static Pressure (Ps)	-0.15
Stack Geometry (R or C)?	C
Stack Diameter (in)	96.0
Stack Width (If Rectangle)	
Nozzle ID 1 (in)	0.374
Nozzle ID 2 (in)	0.375
Nozzle ID 3 (in)	0.375
Nozzle ID (in)	0.375
N ₂ Percent	82.9

Impinger Weights (g)

	Initial	Final	Net
Impinger 1	493.3	582.8	89.5
Impinger 2	665.7	663.6	-2.1
Impinger 3	763.3	767.7	4.4
Impinger 4	969.4	984.5	15.1
Impinger 5			0
Impinger 6			0
Impinger 7			0
Impinger 8			0
Moisture Collected (g)			106.9

Saturated Percent Moisture	102.05	Standard
Calculated Percent Moisture	11.44	Volume (dscf)
Isokinetic %	101.7	39.0

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft ³)	Velocity Head (ΔP) (in H ₂ O)	Orifice Pressure Diff (ΔH) (in H ₂ O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
A1	0	17:00:00	296.695	0.25	1.34	1542	71
A2	3	17:03:00	298.460	0.23	1.23	1537	72
A3	6	17:06:00	300.220	0.22	1.18	1530	70
A4	9	17:09:00	301.930	0.19	1.02	1517	70
A5	12	17:12:00	303.550	0.15	0.80	1488	70
A6	15	17:15:00	304.950	0.16	0.86	1491	69
STOP	18	17:18:00	306.429				
B1	18	17:21:00	306.429	0.24	1.28	1496	69
B2	21	17:24:00	308.150	0.22	1.18	1515	69
B3	24	17:27:00	309.820	0.20	1.07	1513	69
B4	27	17:30:00	311.450	0.19	1.02	1507	69
B5	30	17:33:00	313.060	0.18	0.96	1523	69
B6	33	17:36:00	314.620	0.18	0.96	1544	69
STOP	36	17:39:00	316.186				
C1	36	17:42:00	316.186	0.27	1.44	1558	68
C2	39	17:45:00	318.030	0.27	1.44	1595	69
C3	42	17:48:00	319.890	0.25	1.34	1593	69
C4	45	17:51:00	321.690	0.21	1.12	1587	68
C5	48	17:54:00	323.410	0.14	0.75	1447	68
C6	51	17:57:00	324.830	0.14	0.75	1502	68
STOP	54	18:00:00	326.242				
D1	54	18:04:00	326.242	0.25	1.34	1549	68
D2	57	18:07:00	328.050	0.25	1.34	1587	68
D3	60	18:10:00	329.790	0.24	1.28	1580	68
D4	63	18:13:00	331.530	0.22	1.18	1573	68
D5	66	18:16:00	333.160	0.16	0.86	1544	68
D6	69	18:19:00	334.650	0.16	0.86	1540	68
STOP	72	18:22:00	336.094				

Run Used: Yes
Enter data in unshaded areas.

Sample Type	Method 5/202
Client/Plant	Suncok/Indiana Harbor
Project Number	60644323
Sampling Location	HRCC Oven Vent A-3
Condition	Full Load
Meter Box Number	SC-M1551
Meter Factor (γ_d)	1.0090
Minutes per Point	3.0
Barometric Pressure	29.38

O2/CO2 Method 3A

	CO2 Percent	O2 Percent
Replicate 1	6.900	10.250
Replicate 2		
Replicate 3		
Average	6.9	10.3

Date	11/4/2020
Operator	WL/SJ
Run Number	4
K Factor	5.35
Meter $\Delta H_{@}$	1.9640
Pitot Constant	0.84
Port Height (ft)	0
Static Pressure (Ps)	-0.13
Stack Geometry (R or C)?	C
Stack Diameter (in)	96.0
Stack Width (If Rectangle)	
Nozzle ID 1 (in)	0.374
Nozzle ID 2 (in)	0.375
Nozzle ID 3 (in)	0.375
Nozzle ID (in)	0.375

Impinger Weights (g)		
	Initial	Final
Impinger 1	452.8	538.2
Impinger 2	659.1	657.9
Impinger 3	782.4	780.5
Impinger 4	991.6	1005.1
Impinger 5		
Impinger 6		
Impinger 7		
Impinger 8		
Moisture Collected (g)		95.8

Saturated Percent Moisture	101.87	Standard
Calculated Percent Moisture	10.82	Volume (dscf)
Isokinetic %	98.8	37.2

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft ³)	Velocity Head (ΔP) (in H ₂ O)	Orifice Pressure Diff (ΔH) (in H ₂ O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
D1	0	7:45:00	336.357	0.28	1.49	1529	54
D2	3	7:48:00	338.160	0.28	1.49	1529	54
D3	6	7:51:00	339.910	0.25	1.49	1523	54
D4	9	7:54:00	341.560	0.22	1.34	1518	55
D5	12	7:57:00	343.130	0.15	0.80	1386	55
D6	15	8:00:00	344.540	0.15	0.80	1386	55
STOP	18	8:03:00	345.938				
C1	18	8:06:00	345.938	0.24	1.28	1500	56
C2	21	8:09:00	347.790	0.22	1.18	1512	56
C3	24	8:12:00	349.420	0.19	1.02	1507	57
C4	27	8:15:00	350.940	0.18	0.96	1500	57
C5	30	8:18:00	352.440	0.10	0.54	1455	58
C6	33	8:21:00	353.600	0.10	0.54	1421	58
STOP	36	8:24:00	354.746				
B1	36	8:28:00	354.746	0.23	1.23	1502	59
B2	39	8:31:00	356.350	0.22	1.18	1515	59
B3	42	8:34:00	357.950	0.21	1.12	1512	60
B4	45	8:37:00	359.570	0.20	1.07	1508	61
B5	48	8:40:00	361.280	0.12	0.64	1507	61
B6	51	8:43:00	362.570	0.12	0.64	1449	62
STOP	54	8:46:00	363.836				
A1	54	8:49:00	363.836	0.27	1.44	1511	63
A2	57	8:52:00	365.620	0.25	1.34	1525	63
A3	60	8:55:00	367.300	0.25	1.34	1524	64
A4	63	8:58:00	368.960	0.20	1.07	1514	65
A5	66	9:01:00	370.560	0.13	0.69	1494	65
A6	69	9:04:00	371.920	0.13	0.69	1486	66
STOP	72	9:07:00	373.215				



Suncoke/Indiana Harbor
HRCC Oven Vent A-3
Method 5/202
Emission Calculations

Filterable Particulate Matter

Run	Date	Time	Filter Weight (mg)	Rinse Weight (mg)	Total Catch (mg)	Sample Volume (dscf)	PM Concentration (gr/dscf)	Weighted PM Concentration (gr/dscf)	Flow Rate (dscfm)	PM Emissions (lb/hr)	Weighted PM Emissions (lb/hr)
1	11/3/2020	12:00 - 13:20	28.140	71.180	99.3	33.435	0.046	0.0183	31,905	12.537	5.015
2	11/3/2020	15:05 - 16:25	228.730	99.550	328.3	36.106	0.140	0.0140	32,775	39.417	3.942
3	11/3/2020	17:00 - 18:22	65.200	45.892	111.1	39.010	0.044	0.0044	34,983	13.178	1.318
4	11/4/2020	07:45 - 09:07	20.860	44.842	65.7	37.247	0.027	0.0109	34,365	8.018	3.207
Field Blank			-0.400		-0.400						
Reagent Blank				0.00136	0.00136						
AVERAGE					151.1	36.449		0.048	33,507		13.481



Suncoke/Indiana Harbor
 HRCC Oven Vent A-3
 EPA Method 202
 Emission Calculations

Condensible Particulate Matter

Run	Date	Time	Organic Catch (mg)	Corrected Inorganic (mg)	CPM* (mg)	Sample Volume (dscf)	CPM Concentration (gr/dscf)	Weighted CPM Concentration (gr/dscf)	Flow Rate (dscfm)	CPM Emissions (lb/hr)	Weighted CPM Emissions (lb/hr)
1	11/3/2020	12:00 - 13:20	1.314	40.036	39.4	33.435	0.018	0.0073	31,905	4.967	1.987
2	11/3/2020	15:05 - 16:25	3.535	26.827	28.4	36.106	0.012	0.0012	32,775	3.405	0.341
3	11/3/2020	17:00 - 18:22	1.545	48.695	48.2	39.010	0.019	0.0019	34,983	5.722	0.572
4	11/4/2020	07:45 - 09:07	6.934	58.586	63.5	37.247	0.026	0.0105	34,365	7.750	3.100
			Organic	Inorganic	CPM						
Train Blank			1.271	2.173	3.4						
AVERAGE					44.9	36.449		0.021	33,507		5.999

*CPM corrected for train blank by subtracting actual train blank CPM up to maximum correction of 2.0 mg

Total Particulate Matter (Filterable Plus Condensible)

Run	Total PM (mg)	Sample Volume (dscf)	Total PM Concentration (gr/dscf)	Weighted Total PM Concentration (gr/dscf)	Flow Rate (dscfm)	Total PM Emissions (lb/hr)	Weighted Total PM Emissions (lb/hr)
1	138.7	33.435	0.064	0.0256	31,905	17.504	7.001
2	356.6	36.106	0.152	0.0152	32,775	42.823	4.282
3	159.3	39.010	0.063	0.0063	34,983	18.900	1.890
4	129.2	37.247	0.054	0.0214	34,365	15.768	6.307
Average	196.0	36.449		0.069	33,507		19.481

Sample Type	Filt and Cond PM (M5/M202)	Date	11/3/2020	Barometer ID	SW1200202233	Page	1 of 2
Project Name	Suncoke Indiana Harbor	Cond	Coking	Run	ONE	Train Leak Rate (cfm @ "Hg)	
Project Number	6064323.03	Console ID	SC-M1551	Stat. Press. ("H ₂ O)	-0.06	Initial	.008 @ 15
Facility	Indiana Harbor	DGMCF	1.009	Probe ID	AC-01	Final	.004 @ 8
Source	Oven Vent A-3	ΔH@	1.964 K _r 5.13	PTCF	0.84	Pitot Tube Leak Check ("H ₂ O @ "H ₂ O)	
Operator	CT/WL/EST	Filter No.		Meter Elevation (ft) (relative to Barometer)	0	Initial (-)	EST 8 @ 6
Duct Dimension(s)	9C"	Nozzle Dia (in)	0.375			Initial (+)	EST 7 @ 7
Nozzle Calibration				Caliper Used	ID CAL-M1504	Final (-)	✓ @ 5
				Calibration Exp Date	8/19/2021	Final (+)	✓ @ 7

Post-Test Stack TC Check	Reference Thermometer ID	Ref Thermometer Exp Date	Thermometer and TC agree within 2°F	Y/N	Post-Test: Are Pitots Damaged?	Y/N
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Point	Clock Time	Elapsed Time (optional)	DGM Reading (ft)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Temperature (°F)						Vacuum ("Hg)
						Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	
A-1	12:00	0	224.605	.22	1.13	1491	N/A	259	71	53	71	4
A-2	12:02	2:30	225.94	.21	1.08	1494	N/A	252	68	48	72	4
A-3	12:05	5	227.30	.19	.98	1488	N/A	256	67	47	71	4
A-4	12:07	7:30	228.60	.14	.72	1474	N/A	257	66	48	71	3
A-5	12:10	10	229.77	.1	.51	1420	N/A	257	67	50	71	3
A-6	12:13	12:30	230.74	.1	.51	1434	N/A	254	66	50	72	2
Pause	12:15	15	231.696									
B-1	12:18	15	231.696	.21	1.08	1456	N/A	255	68	50	72	4
B-2	12:20	17:30	233.04	.19	.98	1478	N/A	261	69	48	72	4
B-3	12:23	20	234.36	.15	.76	1468	N/A	267	68	47	72	3.5
B-4	12:25	22:30	235.56	.13	.66	1456	N/A	255	68	48	72	3
B-5	12:28	25	236.69	.1	.51	1468	N/A	248	69	51	73	3
B-6	12:30	27:30	237.67	.1	.51	1461	N/A	236	69	54	73	2
Pause	12:33	30	238.635									
C-1	12:36	30	238.635	.22	1.13	1476	N/A	239	72	55	73	5
C-2	12:38	32:30	239.99	.2	1.02	1484	N/A	264	71	52	74	5
C-3	12:41	35	241.36	.18	.91	1477	N/A	252	71	52	74	5
C-4	12:43	37:30	242.67	.15	.76	1470	N/A	245	70	52	74	4
C-5	12:46	40	243.86	.15	.76	1469	N/A	255	72	54	74	4
C-6	12:48	42:30	245.16	.1	.51	1472	N/A	246	71	54	74	3
Pause	12:51	45	246.092									
D-1	12:55	45	246.092	.21	1.06	1481	N/A	246	74	57	75	5
D-2	12:57	47:30	247.40	.22	1.11	1488	N/A	246	72	54	75	5.5
D-3	13:00	50	248.81	.2	1.01	1484	N/A	242	72	51	75	5.5
D-4	13:02	52:30	250.14	.19	.96	1478	N/A	246	72	49	75	5.5
D-5	13:05	55	251.58	.15	.76	1461	N/A	240	73	51	75	5
D-6	13:07	57:30	252.77	.15	.76	1459	N/A	251	72	51	76	5
D-6	13:10	60	253.83	.15	.76	1459	N/A	238	72	52	76	5
D-6	13:12	62:30	255.02	.15	.76	1460	N/A	256	69	51	76	5.5

Notes:	5.14 for A-3	5.08 for B-3	¹ Remember to record Final CPM Filter Temperature	SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially
	5.04 for D-1			

Project Name	Suncake IN Huber
Project Number	60644523.03
Date	11/3/2020
Source	Oven Vent A-3

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Coking
Run No.	One
Balance ID	BAL-11701
Recovered by	

Moisture Determination

Imp No.	Contents	Vol (mL)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	491.2	661.4
2	empty	--	Mod	661.4	661.9
3	Water	100	Mod	760.3	765.4
4	Silica Gel	~300g	Mod	955.7	962.5
5					

Filter

* FWT Imp 1 = 551.5

Filter ID Number	023874 023875
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Sample Log

Sample ID Number	Sample Container	Description
I H O -M5/202-PNR-RS	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
- _____ Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
- _____ Note condition of the silica gel impinger. ____% spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Notes:	<i>¹ Remember to record Final CPM Filter Temperature</i>	SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially
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Sample Type	Filt and Cond PM (M5/M202)		Date	10-3-20		Barometer ID	31N: 200202233		Page	1 of	
Project Name	Smoke Indiana Harbor		Cond	Pool		Run	TWO		Bar. Press. ("Hg)	29.36	
Project Number	60644323.03		Console ID	5C-M1551		Stat. Press. ("H ₂ O)	-0.08		Train Leak Rate (cfm @ "Hg)	Initial 0.004 @ 15	
Facility	Indiana Harbor		DGMCF	1.009		Probe ID	AC-01		Final	0.002 @ 11	
Source	Area Vent A-3		ΔH@	1.964		K _f	5.04		PTCF	0.84	
Operator	WL/EST/CT		Filter No.	023875		Meter Elevation (ft) (relative to Barometer)	0		Pitot Tube Leak Check ("H ₂ O @ "H ₂ O)	Initial (-) ✓ @ 5	
Duct Dimension(s)	96"		Nozzle Dia (in)	0.375		Caliper Used	ID CAC-41504		Initial (+) ✓ @ 7	Final (-) ✓ @ 6	
Nozzle Calibration			Calibration Exp Date			Final (+) ✓ @ 7					

Post-Test Stack TC Check	Reference Thermometer ID	Ref Thermometer Exp Date	Thermometer and TC agree within 2°F	Y/N	Post-Test: Are Pitots Damaged?	Y/N
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Point	Clock Time	Elapsed Time (optional)	DGM Reading (ft ³)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Temperature (°F)						Vacuum ("Hg)
						Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	
D-1	15:05	0	259.69	.24	1.27	1455	N/A	252	75	65	74	4.5
D-2	15:08	3	261.40	.21	1.11	1453	N/A	245	70	60	74	4.5
D-3	15:11	6	263.07	.19	1.01	1450	N/A	249	68	59	74	4
D-4	15:14	9	264.69	.17	.90	1445	N/A	248	68	58	74	4
D-5	15:17	12	266.25	.13	.69	1430	N/A	252	68	58	74	3
D-6	15:20	15	267.59	.1	.54	1444	N/A	243	69	59	74	2
Pause	15:23	18	268.850									
C-1	15:26	18	268.850	.21	1.12	1444	N/A	241	72	63	75	5
C-2	15:29	21	270.45	.19	1.02	1446	N/A	252	69	61	74	5
C-3	15:32	24	272.09	.17	.91	1442	N/A	263	68	62	75	4.5
C-4	15:35	27	273.66	.16	.86	1435	N/A	253	67	62	76	4.5
C-5	15:38	30	275.17	.12	.64	1437	N/A	248	65	61	75	3.5
C-6	15:41	33	276.50	.12	.64	1445	N/A	239	65	61	75	3.5
Pause	15:44	36	277.810								74.5	
B-1	15:46	36	277.810	.21	1.12	1452	N/A	248	66	63	74	5
B-2	15:49	39	279.45	.21	1.12	1464	N/A	241	65	63	75	6
B-3	15:52	42	281.11	.17	.91	1476	N/A	250	64	59	75	5
B-4	15:55	45	282.68	.17	.91	1480	N/A	249	64	56	74	5
B-5	15:58	48	284.22	.13	.69	1454	N/A	248	65	55	74	5
B-6	16:01	51	285.60	.13	.69	1472	N/A	250	65	54	74	5
Pause	16:04	54	286.960									
A-1	16:07	54	286.960	.24	1.28	1560	N/A	251	66	55	74	7.5
A-2	16:10	57	288.67	.23	1.23	1596	N/A	254	65	53	74	8
A-3	16:13	60	290.40	.22	1.18	1601	N/A	248	65	52	74	8.5
A-4	16:16	63	292.18	.2	1.07	1594	N/A	244	63	53	74	9
A-5	16:19	66	293.76	.12	.64	1471	N/A	246	62	53	74	5
A-6	16:22	69	295.13	.13	.69	1410	N/A	248	62	54	74	6
STOP	16:25	72	296.477									

Notes:	K factor: 53	5.35 at D-6	¹ Remember to record Final CPM Filter Temperature	SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially
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Project Name	Suncoke In/Head
Project Number	60644323.03
Date	11/3/2020
Source	Oven Vent A-3

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Production
Run No.	Two
Balance ID	BAL-41701
Recovered by	RT

Moisture Determination

Imp No.	Contents	Vol (mL)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	451.4	523.4
2	empty	--	Mod	655.8	656.4
3	Water	100	Mod	785.9	784.4
4	Silica Gel	~300g	Mod	973.2	991.7
5					

Filter

Filter ID Number	023875
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Sample Log

Sample ID Number	Sample Container	Description
IHO -M5/202-PNR-R2	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger.
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
- _____ Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet.
- _____ Note condition of the silica gel impinger. _____ % spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s).
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Sample Type	Filt and Cond PM (M5/M202)	Date	11-3-20	Barometer ID	31v: 20202233	Page	1 of 1
Project Name	Sincoke Indiana Harbor	Cond	Prod	Run	THREE	Train Leak Rate (cfm @ "Hg)	
Project Number	60644323.03	Console ID	SC-M1551	Stat. Press. ("H ₂ O)	-1.15	Initial	0.006 @ 15
Facility	Indiana Harbor	DGMCF	1.009	Probe ID	AC-01	Final	0.004 @ 15
Source	Oven Vent A-J	ΔH@	1.964	K _i	5.35	Pitot Tube Leak Check ("H ₂ O @ "H ₂ O)	
Operator	ESJ/WL/CT	Filter No.	023877	Meter Elevation (ft) (relative to Barometer)	0	Initial (-)	✓ @ 6
Duct Dimension(s)	96"	Nozzle Dia (in)	0.375			Initial (+)	✓ @ 6
Nozzle Calibration			Caliper Used	ID	CAL-M1504	Final (-)	✓ @ 5
			Calibration Exp Date			Final (+)	✓ @ 6

Post-Test Stack TC Check	Reference Thermometer ID	Ref Thermometer Exp Date	Thermometer and TC agree within 2°F	Y/N	Post-Test: Are Pitots Damaged?	Y/N
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Point	Clock Time	Elapsed Time (optional)	DGM Reading (R ²)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Temperature (°F)						Vacuum ("Hg)
						Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	
A-1	17:00	0	296.695	.25	1.34	1542	N/A	255	64	59	71	5
A-2	17:03	3	298.46	.23	1.23	1537	N/A	257	63	60	72	5
A-3	17:06	6	300.22	.22	1.18	1530	N/A	255	61	62	70	5
A-4	17:09	9	301.93	.19	1.02	1517	N/A	252	61	63	70	5
A-5	17:12	12	303.55	.15	.80	1488	N/A	250	61	63	70	4
A-6	17:15	15	304.95	.16	.86	1491	N/A	250	61	61	69	4
Pause	17:18	18	306.429		4 EST							
B-1	17:21	18	306.429	.22	1.28	1496	N/A	251	60	49	69	5
B-2	17:24	21	308.15	.22	1.18	1515	N/A	251	59	46	69	5
B-3	17:27	24	309.82	.2	1.07	1513	N/A	247	59	45	69	5
B-4	17:30	27	311.45	.19	1.02	1507	N/A	247	59	43	69	5
B-5	17:33	30	313.06	.18	.96	1523	N/A	249	59	43	69	5
B-6	17:36	33	314.62	.18	.96	1544	N/A	248	59	43	69	5
Pause	17:39	36	316.186									
C-1	17:42	36	316.186	.22	1.44	1558	N/A	258	59	43	68	8
C-2	17:45	39	318.03	.27	1.44	1515	N/A	266	59	41	69	8
C-3	17:48	42	319.89	.25	1.34	1513	N/A	256	58	40	69	9
C-4	17:51	45	321.69	.21	1.12	1587	N/A	243	57	40	68	9.5
C-5	17:54	48	323.41	.14	.75	1447	N/A	248	58	43	68	7
C-6	17:57	51	324.83	.14	.75	1502	N/A	236	58	42	68	7
Pause	18:00	54	326.242									
D-1	18:04	54	326.242	.25	1.34	1541	N/A	249	58	45	68	10
D-2	18:07	57	328.05	.25	1.34	1587	N/A	241	59	42	68	10
D-3	18:10	60	329.79	.24	1.28	1580	N/A	235	58	45	68	11
D-4	18:13	63	331.53	.22	1.18	1573	N/A	259	57	41	68	11.5
D-5	18:16	66	333.16	.16	.86	1544	N/A	242	57	42	68	11
D-6	18:19	69	334.65	.16	.86	1540	N/A	241	57	42	68	12
STOP	18:22	72	336.094									

Notes:	¹ Remember to record Final CPM Filter Temperature	SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially
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CT

Project Name	H73102 Smoke W/Heater
Project Number	60644323.03
Date	11/3/2020
Source	Oven Vent 43

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Production
Run No.	THREE
Balance ID	BAL-11701
Recovered by	CT

Moisture Determination

Imp No.	Contents	Vol (mL)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	493.3	582.8
2	empty	--	Mod	665.7	663.6
3	Water	100	Mod	768.3	767.7
4	Silica Gel	~300g	Mod	969.4	984.5
5					

Filter

Filter ID Number	023877
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Sample Log

Sample ID Number	Sample Container	Description
IHO -M5/202-PNR-13	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger.
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
- _____ Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
- _____ Note condition of the silica gel impinger. ____% spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Sample Type Filt and Cond PM (M5/M202)		Date 11-4-20	Barometer ID 51N: 200202133	Page 1 of 1
Project Name Indiana Harbor		Cond Coke	Run Four	Bar. Press. ("Hg) 29.38
Project Number 60044323.03		Console ID SC-M1551	Stat. Press. ("H ₂ O) -1.3	Train Leak Rate (cfm @ "Hg) Initial 0.002 @ 15
Facility Indiana Harbor		DGMCF 1.009	Probe ID AC-01	Final 0.004 @ 15
Source Over Vent Stack A-3		ΔH@ 1.964 K _i 5.35	PTCF 0.84	Pitot Tube Leak Check ("H ₂ O @ "H ₂ O) Initial (-) ✓ @ 6
Operator ESJ/WL/CT		Filter No. 375	Meter Elevation (ft) (relative to Barometer) 0	Initial (+) ✓ @ 7
Duct Dimension(s) 96"		Nozzle Dia (in) 375	Caliper Used CAL-M1504	Final (-) ✓ @ 5
Nozzle Calibration 374 375 375		ID CAL-M1504	Calibration Exp Date	Final (+) ✓ @ 6

Post-Test Stack TC Check	Reference Thermometer ID TM-1903	Ref Thermometer Exp Date 1/22/2021	Thermometer and TC agree within 2°F ✓/N	Post-Test: Are Pitots Damaged? Y/(N)
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Point	Clock Time	Elapsed Time (optional)	DGM Reading (ft ³)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Temperature (°F)						Vacuum ("Hg)
						Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	
D-1	7:45	0	336.357	.28	1.49	1529	N/A	252	57	55	54	6
D-2	7:48	3	338.16	.28	1.49	1529	N/A	250	57	56	54	7
D-3	7:51	6	339.91	.25	1.34	1523	N/A	246	55	59	54	9
D-4	7:54	9	341.56	.23	1.18	1518	N/A	247	55	60	55	12
D-5	7:57	12	343.13	.15	.80	1386	N/A	256	55	58	55	10
D-6	8:00	15	344.54	.15	.80	1383	N/A	251	57	54	55	7
Pause	8:03	18	345.138	PORT CHANGE								
C-1	8:06	18	345.438	.24	1.28	1500	N/A	258	52	52	56	8
C-2	8:09	21	347.79	.22	1.18	1512	N/A	244	51	52	56	9
C-3	8:12	24	349.42	.19	1.02	1507	N/A	259	51	51	57	9
C-4	8:15	27	350.94	.18	.96	1500	N/A	250	50	50	57	9
C-5	8:18	30	352.44	.1	.54	1455	N/A	256	51	49	58	6
C-6	8:21	33	353.60	.1	.54	1421	N/A	253	51	48	58	6
Pause	8:24	36	354.746	PORT CHANGE								
B-1	8:28	36	354.746	.23	1.23	1502	N/A	243	52	49	59	10
B-2	8:31	39	356.35	.22	1.18	1515	N/A	260	51	47	59	11
B-3	8:34	42	357.95	.21	1.12	1512	N/A	246	51	46	60	13
B-4	8:37	45	359.57	.2	1.07	1508	N/A	243	51	47	61	13
B-5	8:40	48	361.28	.18	.84	1507	N/A	239	51	46	61	13
B-6	8:43	51	362.57	.12	.64	1449	N/A	241	52	47	62	11
Pause	8:46	54	363.836	PORT CHANGE								
A-1	8:49	57	363.836	.27	1.44	1511	N/A	244	52	47	63	12
A-2	8:52	57	365.62	.25	1.34	1525	N/A	246	52	46	63	12
A-3	8:55	60	367.30	.25	1.34	1524	N/A	248	52	47	64	12
A-4	8:58	63	368.96	.2	1.07	1514	N/A	247	52	49	65	11
A-5	9:01	66	370.56	.13	.69	1494	N/A	247	52	51	65	10
A-6	9:04	69	371.92	.13	.69	1486	N/A	247	52	51	66	10
STOP	9:07	72	373.215									

Notes:	¹ Remember to record Final CPM Filter Temperature	SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially
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Project Name	Emcke Harbor
Project Number	66644323.03
Date	11/4/2020
Source	Over Vent A-3

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Coking
Run No.	Four
Balance ID	BAL-M1701
Recovered by	C. Thompson

Moisture Determination

Imp No.	Contents	Vol (mL)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	452.8	538.2
2	empty	--	Mod	659.1	657.9
3	Water	100	Mod	782.4	780.5
4	Silica Gel	~300g	Mod	991.6	1505.1
5					

Filter

Filter ID Number	025878
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Sample Log

Sample ID Number	Sample Container	Description
I40 -M5/202-PNR-K4	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
Note condition of the silica gel impinger. ____% spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Appendix E
PCM EMISSION CALCULATIONS AND DATA



Emissions Test Run Summary

Facility:	SunCoke/Indiana Harbor			
Location:	PCM A/B - 202B			
Condition	Compliance			
Sample Type:	Method 5/202			
Was the run used?	Yes	Yes	Yes	
Run Number:	1	2	3	
Date:	4-Nov-20	4-Nov-20	4-Nov-20	Average
Total Sampling Time (min)	60.0	60.0	60.0	60.0
Corrected Barometric Pressure (in Hg)	29.38	29.38	29.40	29.39
Absolute Stack Pressure (in Hg)	29.36	29.36	29.38	29.37
Stack Static Pressure (in H ₂ O)	-0.26	-0.25	-0.28	-0.26
Average Stack Temperature (°F)	111.6	105.3	100.8	105.9
Stack Area (sq in)	2248	2248	2248	2248
Actual Meter Volume (cu ft)	40.044	40.205	42.262	40.837
Average Meter Pressure (in H ₂ O)	1.63	1.68	1.88	1.73
Average Meter Temperature (°F)	74.3	70.8	68.3	71.1
Moisture Collected (g)	12.8	14.6	12.6	13.3
Carbon Dioxide Concentration (%V)	0.4	0.3	0.3	0.3
Oxygen Concentration (%V)	20.6	20.8	20.7	20.7
Nitrogen Concentration (%V)	79.0	79.0	79.0	79.0
Dry Gas Meter Factor (γ _d)	1.0100	1.0100	1.0100	1.0100
Nozzle Diameter (in)	0.227	0.227	0.227	0.227
Pitot Constant	0.84	0.84	0.84	0.84
Average Sampling Rate (dscfm)	0.657	0.664	0.702	0.674
Standard Metered Volume (dscf)	39.407	39.828	42.120	40.452
Standard Metered Volume (dscm)	1.116	1.128	1.193	1.145
Stack Moisture (%V)	1.51	1.70	1.39	1.53
Saturated Moisture (%V)	9.1	7.6	6.6	7.8
Mole Fraction Dry Stack Gas	0.985	0.983	0.986	0.985
Dry Molecular Weight	28.89	28.88	28.88	28.88
Wet Molecular Weight	28.72	28.69	28.72	28.71
Average SQRT of Delta P	0.749	0.758	0.802	0.770
Stack Gas Velocity (fps)	44.31	44.57	46.94	45.27
Stack Gas Velocity (mpm)	13.5	13.6	14.3	13.8
Volumetric Flow Rate (acfm)	41499	41750	43971	42407
Volumetric Flow Rate (acmm)	1175	1182	1245	1201
Volumetric Flow Rate (dscfm)	37051	37620	40090	38254
Volumetric Flow Rate (dscmm)	1049	1065	1135	1083
Percent Isokinetic	98.8	98.3	97.6	98.2
Post Test Meter QA (γ _{qa})	1.0099	1.0159	1.0194	1.0151

Run Used: Yes
Enter data in unshaded areas.

Sample Type	Method 5/202
Client/Plant	SunCoke/Indiana Harbor
Project Number	60644323.03
Sampling Location	PCM A/B - 202B
Condition	Compliance
Meter Box Number	SC-M1554
Meter Factor (γ_d)	1.0100
Minutes per Point	2.5
Barometric Pressure	29.39

O2/CO2 Method 3A

	CO2 Percent	O2 Percent
Replicate 1	0.40	20.60
Replicate 2		
Replicate 3		
Average	0.4	20.6

Date	11/4/2020
Operator	SJ/WL
Run Number	1
K Factor	floating
Meter $\Delta H_{@}$	1.9790
Pitot Constant	0.84
Port Height (ft)	10
Static Pressure (Ps)	-0.26
Stack Geometry (R or C)?	C
Stack Diameter (in)	53.5
Stack Width (If Rectangle)	
Nozzle ID 1 (in)	0.227
Nozzle ID 2 (in)	0.227
Nozzle ID 3 (in)	0.226
Nozzle ID (in)	0.227

N2 Percent

79.0

Impinger Weights (g)

	Initial	Final	Net Gain
Impinger 1	491.9	491.9	0
Impinger 2	663.9	663.9	0
Impinger 3	765.9	767.9	2
Impinger 4	917.3	928.1	10.8
Impinger 5			0
Impinger 6			0
Impinger 7			0
Impinger 8			0
Moisture Collected (g)			12.8

Saturated Percent Moisture	9.10	Standard
Calculated Percent Moisture	1.51	Volume (dscf)
Isokinetic %	98.8	39.4

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft³)	Velocity Head (ΔP) (in H2O)	Orifice Pressure Diff (ΔH) (in H2O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
A1	0	15:46:00	100.402	0.90	2.48	81	71
A2	2.5	15:48:30	102.360	0.26	0.72	140	72
A3	5	15:51:00	103.620	0.25	0.69	125	72
A4	7.5	15:53:30	104.820	0.55	1.51	108	72
A5	10	15:56:00	106.400	0.51	1.40	100	72
A6	12.5	15:58:30	107.990	0.48	1.32	94	72
A7	15	16:01:00	109.550	0.39	1.07	138	73
A8	17.5	16:03:30	110.970	0.70	1.93	126.0	73
A9	20	16:06:00	112.740	1.10	3.03	106	74
A10	22.5	16:08:30	114.970	1.10	3.03	97	74
A11	25	16:11:00	117.280	1.20	3.30	93	74
A12	27.5	16:13:30	119.670	0.97	2.67	129.0	75
STOP	30	16:16:00	121.889				
B1	30	16:18:00	121.889	0.70	1.93	104.0	75
B2	32.5	16:20:30	123.810	0.65	1.79	106	75
B3	35	16:23:00	125.610	0.56	1.55	124.0	75
B4	37.5	16:25:30	127.290	0.48	1.33	121.0	76
B5	40	16:28:00	128.860	0.50	1.39	100	76
B6	42.5	16:30:30	130.440	0.26	0.72	121	76
B7	45	16:33:00	131.640	0.37	1.02	114	76
B8	47.5	16:35:30	133.000	0.48	1.33	101	76
B9	50	16:38:00	134.530	0.45	1.25	94	76
B10	52.5	16:40:30	136.040	0.43	1.19	128	76
B11	55	16:43:00	137.500	0.41	1.14	123.0	76
B12	57.5	16:45:30	138.960	0.45	1.25	105.0	76
STOP	60	16:48:00	140.446				

Run Used: Yes
Enter data in unshaded areas.

Sample Type	Method 5/202	Date	11/4/2020
Client/Plant	SunCoke/Indiana Harbor	Operator	SJ/WL
Project Number	60644323.03	Run Number	2
Sampling Location	PCM A/B - 202B	K Factor	2.77
Condition	Compliance	Meter ΔH@	1.9790
Meter Box Number	SC-M1554	Pitot Constant	0.84
Meter Factor (γ _d)	1.0100	Port Height (ft)	10
Minutes per Point	2.5	Static Pressure (Ps)	-0.25
Barometric Pressure	29.39	Stack Geometry (R or C)?	C
		Stack Diameter (in)	53.5
		Stack Width (If Rectangle)	
		Nozzle ID 1 (in)	0.227
		Nozzle ID 2 (in)	0.227
		Nozzle ID 3 (in)	0.226
		Nozzle ID (in)	0.227

Impinger Weights (g)			
	Initial	Final	Net
Impinger 1	481.1	482.4	1.3
Impinger 2	650.8	650.8	0
Impinger 3	718.3	717.6	-0.7
Impinger 4	948.2	962.2	14
Impinger 5			0
Impinger 6			0
Impinger 7			0
Impinger 8			0
Moisture Collected (g)		14.6	

O2/CO2 Method 3A		
	CO2 Percent	O2 Percent
Replicate 1	0.30	20.75
Replicate 2		
Replicate 3		
Average	0.3	20.8

N2 Percent	79.0
------------	------

Saturated Percent Moisture	7.64	Standard
Calculated Percent Moisture	1.70	Volume (dscf)
Isokinetic %	98.3	39.8

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft³)	Velocity Head (ΔP) (in H2O)	Orifice Pressure Diff (ΔH) (in H2O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
B1	0	17:28:00	141.654	0.73	2.02	126	72
B2	2.5	17:30:30	143.350	0.67	1.86	98	72
B3	5	17:33:00	145.190	0.50	1.39	128	72
B4	7.5	17:35:30	146.860	0.38	1.05	127	72
B5	10	17:38:00	148.270	0.44	1.22	116	72
B6	12.5	17:40:30	149.670	0.45	1.25	97	72
B7	15	17:43:00	151.270	0.50	1.39	89	71
B8	17.5	17:45:30	152.720	0.45	1.25	117.0	71
B9	20	17:48:00	154.290	0.43	1.19	116	71
B10	22.5	17:50:30	155.810	0.41	1.14	96	71
B11	25	17:53:00	157.250	0.45	1.25	91	71
B12	27.5	17:55:30	158.740	0.48	1.33	86.0	71
STOP	30	17:58:00	160.253				
A1	30	18:00:00	160.253	0.30	0.83	126.0	70
A2	32.5	18:02:30	161.520	0.70	1.94	104	70
A3	35	18:05:00	163.300	0.68	1.88	93.0	70
A4	37.5	18:07:30	165.220	0.20	0.55	131.0	70
A5	40	18:10:00	166.350	0.20	0.55	135	70
A6	42.5	18:12:30	167.360	0.42	1.16	127	70
A7	45	18:15:00	168.720	0.74	2.05	99	70
A8	47.5	18:17:30	170.510	0.93	2.58	92	70
A9	50	18:20:00	172.570	1.10	3.05	89	70
A10	52.5	18:22:30	174.770	1.10	3.05	87	70
A11	55	18:25:00	177.110	1.20	3.32	80.0	71
A12	57.5	18:27:30	179.550	1.10	3.05	76.0	71
STOP	60	18:30:00	181.859				

Run Used: Yes
Enter data in unshaded areas.

Sample Type	Method 5/202
Client/Plant	SunCoke/Indiana Harbor
Project Number	60644323
Sampling Location	PCM A/B - 202B
Condition	Compliance
Meter Box Number	SC-M1554
Meter Factor (γ_d)	1.0100
Minutes per Point	2.5
Barometric Pressure	29.41

Date	11/4/2020
Operator	SJ/WL
Run Number	3
K Factor	2.77
Meter ΔH_{θ}	1.9790
Pitot Constant	0.84
Port Height (ft)	10
Static Pressure (Ps)	-0.28
Stack Geometry (R or C)?	C
Stack Diameter (in)	53.5
Stack Width (If Rectangle)	
Nozzle ID 1 (in)	0.227
Nozzle ID 2 (in)	0.227
Nozzle ID 3 (in)	0.226
Nozzle ID (in)	0.227

Impinger Weights (g)			
	Initial	Final	Net
Impinger 1	452.1	454	1.9
Impinger 2	657.6	656.7	-0.9
Impinger 3	723.6	722.5	-1.1
Impinger 4	984.1	996.8	12.7
Impinger 5			0
Impinger 6			0
Impinger 7			0
Impinger 8			0
Moisture Collected (g)			12.6

O2/CO2 Method 3A		
	CO2 Percent	O2 Percent
Replicate 1	0.30	20.68
Replicate 2		
Replicate 3		
Average	0.3	20.7

N2 Percent	79.0
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Saturated Percent Moisture	6.58	Standard
Calculated Percent Moisture	1.39	Volume (dscf)
Isokinetic %	97.6	42.1

Traverse Point Location	Sampling Time (min)	Clock Time (24 hr)	Dry Gas Meter Reading Vm (ft³)	Velocity Head (ΔP) (in H2O)	Orifice Pressure Diff (ΔH) (in H2O)	Stack Temp Ts (F)	Dry Gas Meter Temperature Tm Out (F)
A1	0	19:25:00	182.099	0.80	2.22	73	67
A2	2.5	19:27:30	183.860	0.70	1.94	73	67
A3	5	19:30:00	185.750	0.68	1.88	78	67
A4	7.5	19:32:30	187.640	0.20	0.55	106	67
A5	10	19:35:00	188.830	0.22	0.61	104	67
A6	12.5	19:37:30	189.880	0.45	1.25	85	67
A7	15	19:40:00	191.310	0.45	1.25	83	67
A8	17.5	19:42:30	192.770	0.68	1.88	134	67
A9	20	19:45:00	194.550	0.88	2.44	123	67
A10	22.5	19:47:30	196.610	1.10	3.05	96	68
A11	25	19:50:00	198.700	1.10	3.05	96	68
A12	27.5	19:52:30	200.980	0.87	2.41	112	68
STOP	30	19:55:00	203.096				
B1	30	19:56:00	203.096	0.78	2.16	95	68
B2	32.5	19:58:30	205.080	0.68	1.88	91	69
B3	35	20:01:00	207.050	0.60	1.66	105	69
B4	37.5	20:03:30	208.710	0.16	0.44	110	69
B5	40	20:06:00	209.770	0.43	1.19	99	69
B6	42.5	20:08:30	211.140	0.43	1.19	91	69
B7	45	20:11:00	212.610	0.43	1.19	118	69
B8	47.5	20:13:30	214.080	0.66	1.83	126	69
B9	50	20:16:00	215.640	1.10	3.05	101	70
B10	52.5	20:18:30	217.850	0.94	2.60	98	70
B11	55	20:21:00	220.050	0.83	2.29	119	70
B12	57.5	20:23:30	222.110	1.10	3.05	102	70
STOP	60	20:26:00	224.361				



SunCoke/Indiana Harbor
PCM A/B - 202B
Method 5/202
Emission Calculations

Compliance

Production Units /hour

Filterable Particulate Matter

Run	Date	Time	Filter Weight ^A (mg)	Rinse Weight (mg)	Total Catch (mg)	Sample Volume (dscf)	PM Concentration (gr/dscf)	Oxygen (%)	Flow Rate (dscfm)	PM Emissions (lb/hr)	Coal Production Rate (dry tons/hr)	PM Emissions (lb/dry tons)
1	11/4/2020	15:46 - 16:48	0.25	1.2310	1.5	39.407	0.00058	20.6	37,051	0.18	213.7	0.0009
2	11/4/2020	17:28 - 18:30	0	0.7930	0.8	39.828	0.00031	20.8	37,620	0.10	143.4	0.0007
3	11/4/2020	19:25 - 20:26	0.54	0.9110	1.5	42.120	0.00053	20.7	40,090	0.18	214.9	0.0009
Field Blank			-0.4		-0.4							
Reagent Blank					0.0							
AVERAGE					1.2417	40.452	0.00047	20.7	38,254	0.16	190.7	0.0008

^A- For the purposes of this test, the reagent blank of the Quartz Fiber Filter is taken into consideration for the net filter catch and the results are adjusted to them as a baseline measurement



SunCoke/Indiana Harbor
PCM A/B - 202B
EPA Method 202
Emission Calculations

Compliance

Production Units /hour

Condensible Particulate Matter

Run	Date	Time	Organic Catch (mg)	Corrected Inorganic (mg)	CPM* (mg)	Sample Volume (dscf)	CPM Concentration (gr/dscf)	Flow Rate (dscfm)	CPM Emissions (lb/hr)	Coal Production Rate (dry tons/hr)	CPM Emissions (lb/dry tons)
1	11/4/2020	15:46 - 16:48	2.3	3.3	3.6	39.407	0.0014	37,051	0.45	213.7	0.0021
2	11/4/2020	17:28 - 18:30	2.7	2.7	3.4	39.828	0.0013	37,620	0.43	143.4	0.0030
3	11/4/2020	19:25 - 20:26	1.5	5.3	4.8	42.120	0.0018	40,090	0.60	214.9	0.0028
			Organic	Inorganic	CPM						
Train Blank			1.271	2.2	3.4						
AVERAGE					3.9	40.452	0.0015	38,254	0.49	190.7	0.0026

*CPM corrected for train blank by subtracting actual train blank CPM up to maximum correction of 2.0 mg

Total Particulate Matter (Filterable Plus Condensible)

Run	Total PM (mg)	Sample Volume (dscf)	Total PM Concentration (gr/dscf)	Flow Rate (dscfm)	Total PM Emissions (lb/hr)	Coal Production Rate (dry tons/hr)	Total PM Emissions (lb/dry tons)
1	5.1	39.407	0.0020	37,051	0.63	213.7	0.0029
2	4.2	39.828	0.0016	37,620	0.53	143.4	0.0037
3	6.2	42.120	0.0023	40,090	0.79	214.9	0.0037
Average	5.2	40.452	0.0020	38,254	0.65	190.7	0.0034

Sample Type			Filt and Cond PM (M5/M202)	Date	Barometer ID	Page						
Project Name			Sunrise Indiana Harbor	Cond Prod Run ONE	Bar. Press. 29.39 ("Hg)	Train Leak Rate (cfm @ "Hg)						
Project Number			G6644J23.03	Console ID SL-M1554	Stat. Press. -0.26 ("H ₂ O)	Initial 0.004 @ 15						
Facility			Indiana Harbor	DGMCF 1.010	Probe ID RYF5-7	Final 0.002 @ 10						
Source			PCM Car A/B 2028	ΔH@ 1.979 K _i 2.75	PTCF 0.84	Pitot Tube Leak Check ("H ₂ O@"H ₂ O)						
Operator			WL/EST	Filter No. 023879	Meter Elevation (ft) 0 (relative to Barometer)	Initial (-) ✓ @ 6						
Duct Dimension(s)			53.51	Nozzle Dia (in) 0.1227		Initial (+) ✓ @ 5						
Nozzle Calibration			0.227 0.227 0.226	Caliper Used	ID CAL-M1504	Final (-) ✓ @ 6						
				Calibration Exp Date	3/19/2021	Final (+) ✓ @ 6						
Post-Test Stack TC Check			Reference Thermometer ID	Ref Thermometer Exp Date	Thermometer and TC agree within 2°F Y/N	Post-Test: Are Pitots Damaged? Y/N						
Point	Clock Time	Elapsed Time (optional)	DGM Reading (R ²)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Stack	Probe (248±25)	Filter (248±25)	CPM Filter [†] (near but <85)	Imp Exit (<68)	DGM Outlet	Vacuum ("Hg)
A-1	15:46	0	100.402	.9	2.48	81	235	231	68	54	71	5
A-2	15:48	2:30	102.36	.26	.72	140	232	270	66	52	72	2
A-3	15:51	5	103.62	.25	.69	185	238	254	65	51	72	2
A-4	15:53	7:30	104.82	.55	1.51	108	236	260	64	49	72	4
A-5	15:56	10	106.40	.51	1.40	100	237	255	64	49	72	4
A-6	15:58	12:30	107.99	.48	1.32	94	238	241	64	50	72	4
A-7	16:01	15	109.55	.39	1.07	138	239	267	64	51	73	3
A-8	16:03	17:30	110.97	.7	1.93	126	238	235	65	52	73	5
A-9	16:06	20	112.74	1.1	3.03	106	232	266	64	51	74	7
A-10	16:08	22:30	114.97	1.1	3.03	97	236	225	64	51	74	7
A-11	16:11	25	117.28	1.2	3.3	93	234	270	64	51	74	7
A-12	16:13	27:30	119.67	.97	2.67	129	236	262	65	51	75	6
Pause	16:16	30	121.889									
B-1	16:18	30	121.889	.7	1.93	104	234	234	65	53	75	5
B-2	16:20	32:30	123.81	.65	1.79	106	234	255	67	53	75	5
B-3	16:23	35	125.61	.56	1.55	124	233	271	66	52	75	4
B-4	16:25	37:30	127.29	.48	1.33	121	234	270	65	52	76	4
B-5	16:28	40	128.86	.5	1.39	100	234	235	67	53	76	4
B-6	16:30	42:30	130.44	.26	.72	121	233	272	67	54	76	3
B-7	16:33	45	131.64	.37	1.02	114	234	238	68	54	76	3
B-8	16:35	47:30	133.00	.48	1.33	101	235	260	67	53	76	4
B-9	16:38	50	134.53	.45	1.25	94	234	226	67	53	76	4
B-10	16:40	52:30	136.04	.43	1.19	128	233	268	67	53	76	3
B-11	16:43	55	137.50	.41	1.14	123	235	224	68	53	76	3
B-12	16:45	57:30	138.96	.45	1.25	105	234	247	68	54	76	3
STOP	16:48	60	140.446									
Notes: 2.5 minute points, 12 points each port K 2.77 at B-3												
SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially												

Project Name	Suncake IN 1466
Project Number	6064433.03
Date	11/4/2020
Source	PCMCAR A/B 2023

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Production
Run No.	095
Balance ID	BAL-M1701
Recovered by	C. Thompson

Moisture Determination

Imp No.	Contents	Vol (ml)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	491.9	491.9
2	empty	--	Mod	663.9	663.9
3	Water	100	Mod	765.9	767.9
4	Silica Gel	~300g	Mod	917.3	928.1
5					

Filter

Filter ID Number	023879
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Sample Log

Sample ID Number	Sample Container	Description
-M5/202-PNR	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
- _____ Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
- _____ Note condition of the silica gel impinger. ____% spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Sample Type	Filt and Cond PM (M5/M202)	Date	11-4-20	Barometer ID	SN: 20020233	Page	1	of	1
Project Name	Suncoke Indiana Harbor	Cond	PROD	Run	TWO	Bar. Press. ("Hg)	29.39	Train Leak Rate (cfm @ "Hg)	
Project Number	60644.323.03	Console ID	SCM1554	Stat. Press. ("H ₂ O)	- .25	Initial	.01	@	15
Facility	Indiana Harbor	DGMCF	1.010	Probe ID	15P5-7	Final	.01	@	10
Source	PCMCAR A/B 2020	ΔH@	1.979	K _f	2.77	PTCF	0.84	Pitot Tube Leak Check ("H ₂ O @ "H ₂ O)	
Operator	WL/EST	Filter No.	023881	Meter Elevation (ft) (relative to Barometer)	0	Initial (-)	-	@	6
Duct Dimension(s)	53.5"	Nozzle Dia (in)	0.227	Caliper Used	0.227	Initial (+)	-	@	6
Nozzle Calibration	0.227	0.227	0.227	ID	CAL-M1504	Final (-)	-	@	7
				Calibration Exp Date	3/19/2021	Final (+)	-	@	5

Post-Test Stack TC Check	Reference Thermometer ID	Ref Thermometer Exp Date	Thermometer and TC agree within 2°F	Y/N	Post-Test: Are Pitots Damaged?	Y/N
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Point	Clock Time	Elapsed Time (optional)	DGM Reading (ft ³)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Temperature (°F)						Vacuum ("Hg)
						Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	
B-1	17:28	0	141.654	.73	2.02	126	227	216	66	60	72	4
B-2	17:30	2:30	143.35	.67	1.86	898	230	224	66	58	72	3
B-3	17:33	5	145.19	.5	1.39	128	224	264	66	57	72	3
B-4	17:35	7:30	146.86	.38	1.05	127	223	265	65	57	72	3
B-5	17:38	10	148.27	.44	1.22	116	225	250	64	55	72	2
B-6	17:40	12:30	149.67	.45	1.25	97	229	234	63	54	72	3
B-7	17:43	15	151.27	.5	1.39	84	230	270	62	53	71	3
B-8	17:45	17:30	152.72	.45	1.25	117	224	245	61	52	71	3
B-9	17:48	20	154.29	.43	1.19	116	227	272	61	52	71	3
B-10	17:50	22:30	155.81	.41	1.14	96	230	261	60	51	71	3
B-11	17:53	25	157.25	.45	1.25	91	232	235	60	51	71	3
B-12	17:55	27:30	158.74	.48	1.33	86	230	270	60	51	71	3
Pause	17:58	30	160.253	.3	.831	126	236	227	61	52	70	2
A-1	18:00	30	160.253	.3	.831	126	236	227	61	52	70	2
A-2	18:02	32:30	161.52	.7	1.94	104	242	254	60	50	70	4
A-3	18:05	35	163.30	.68	1.88	93	243	257	60	49	70	4
A-4	18:07	37:30	165.22	.20	.55	131	250	226	60	50	70	1
A-5	18:13	40	166.35	.2	.55	135	250	237	60	51	70	1
A-6	18:15	42:30	167.36	.42	1.16	127	255	260	61	51	70	2
A-7	18:18	45	168.72	.74	2.05	99	254	240	61	51	70	4
A-8	18:20	47:30	170.51	.93	2.58	92	247	238	60	50	70	5
A-9	18:23	50	172.57	1.1	3.05	89	243	270	59	50	70	5
A-10	18:25	52:30	174.77	1.1	3.05	87	237	228	58	52	70	5
A-11	18:28	55	177.11	1.2	3.32	80	228	241	57	54	71	5
A-12	18:30	57:30	179.55	1.1	3.05	76	230	252	56	55	71	5
STOP	18:33	60	181.859									

Notes:

¹ Remember to record Final CPM Filter Temperature

SDS-36: PM (Filt & Cond) by EPA Methods 5/202
Per: EM SOP-047
Issued: June 2018
Document reviewed biennially

Project Name	Suncoke IN Harbor
Project Number	604432203
Date	11/4/2020
Source	PCM Can A/B 2020

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Production
Run No.	Two
Balance ID	HAL-M1701
Recovered by	C. Thompson

Moisture Determination

Imp No.	Contents	Vol (mL)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	481.1	482.4
2	empty	--	Mod	650.8	650.8
3	Water	100	Mod	718.3	717.6
4	Silica Gel	~300g	Mod	948.2	962.2
5					

Filter

Filter ID Number	023881
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Sample Log

Sample ID Number	Sample Container	Description
-M5/202-PNR	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
Note condition of the silica gel impinger. _____ % spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Sample Type		Filt and Cond PM (M5/M202)		Date	Barometer ID		Page					
Project Name		Cond		Run	Bar. Press. ("Hg)		Train Leak Rate (cfm @ "Hg)					
Project Number		Console ID		Stat. Press. ("H ₂ O)		Initial						
Facility		DGMCF		Probe ID		Final						
Source		ΔH@		K _r	PTCF		Pitot Tube Leak Check ("H ₂ O@ "H ₂ O)					
Operator		Filter No.		Meter Elevation (ft) (relative to Barometer)		Initial (-)						
Duct Dimension(s)		Nozzle Dia (in)				Initial (+)						
Nozzle Calibration		Caliper Used		ID		Final (-)						
				Calibration Exp Date		Final (+)						
Post-Test Stack TC Check		Reference Thermometer ID		Ref Thermometer Exp Date		Thermometer and TC agree within 2°F						
						Post-Test: Are Pitots Damaged?						
Point	Clock Time	Elapsed Time (optional)	DGM Reading (ft ³)	ΔP ("H ₂ O)	ΔH ("H ₂ O)	Stack	Probe (248±25)	Filter (248±25)	CPM Filter ¹ (near but <85)	Imp Exit (<68)	DGM Outlet	Vacuum ("Hg)
A-1	19:25	0	182.099	.8	2.22	73	235	231	62	60	67	4
A-2	19:27	2:30	183.86	.7	1.94	73	234	270	61	56	67	4
A-3	19:30	5	185.75	.68	1.88	78	238	242	59	53	67	4
A-4	19:32	7:30	187.64	.2	.55	106	240	271	57	52	67	1
A-5	19:35	10	188.83	.22	.61	104	245	241	57	51	67	1
A-6	19:37	12:30	189.88	.45	1.25	85	249	272	57	51	67	3
A-7	19:40	15	191.31	.45	1.25	83	255	241	56	51	67	3
A-8	19:42	17:30	192.77	.68	1.88	134	250	259	55	51	67	4
A-9	19:45	20	194.55	.88	2.44	123	239	239	53	51	67	5
A-10	19:47	22:30	196.61	1.1	3.05	96	235	265	53	51	68	7
A-11	19:50	25	198.70	1.1	3.05	96	234	252	52	51	68	7
A-12	19:52	27:30	200.98	.87	2.41	112	230	259	52	51	68	5
Pause	19:55	30	203.096									
B-1	19:56	3:0	203.096	.78	2.16	95	239	242	53	52	68	5
B-2	19:58	32:30	205.08	.68	1.88	91	240	247	53	52	69	5
B-3	20:01	35	207.05	.6	1.66	105	242	236	53	52	69	4
B-4	20:03	37:30	208.71	.16	.44	110	243	253	54	52	69	1
B-5	20:06	40	209.77	.43	1.19	99	250	255	55	53	69	3
B-6	20:08	42:30	211.14	.43	1.19	91	252	238	55	53	69	3
B-7	20:11	45	212.61	.43	1.19	118	254	264	55	52	69	3
B-8	20:13	47:30	214.08	.66	1.83	126	253	225	55	52	69	3
B-9	20:16	50	215.64	1.1	3.05	101	249	255	55	52	70	7
B-10	20:18	52:30	217.85	.94	2.60	98	249	248	55	53	70	6
B-11	20:21	55	220.05	.83	2.29	119	247	225	55	53	70	5
B-12	20:23	57:30	222.11	1.1	3.05	102	246	269	55	54	70	6
STOP	20:26	60	224.361									

Notes:

Remember to record Final CPM Filter Temperature

SDS-36: PM (Filt & Cond) by EPA Methods 5/202 Per: EM SOP-047 Issued: June 2018 Document reviewed biennially

Project Name	Suncoast I H Harbor
Project Number	60644328.03
Date	11/4/2020
Source	PCM CAR A/B 2020

Particulate Matter (incl. Condensable) EPA Method 5/202

Condition No.	Production
Run No.	Titration
Balance ID	BAC-M/201
Recovered by	C. Thompson

Moisture Determination

Imp No.	Contents	Vol (ml)	Configuration	Initial Wt (g)	Final Wt (g)
1	empty	--	Short Stem	452.1	454.0
2	empty	--	Mod	657.6	656.7
3	Water	100	Mod	723.6	722.5
4	Silica Gel	~300g	Mod	984.1	996.8
5					

Filter

Filter ID Number	023882
------------------	--------

Sample Log

Sample ID Number	Sample Container	Description
I H O -M5/202-PNR-123	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

Sample Recovery Checklist

- _____ Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
- _____ Disconnect transfer line. Transfer any water in transfer line or condenser into the knockout impinger
- _____ Rinse transfer line and condenser with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
- _____ Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
- _____ Volume of water added: _____
- _____ Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
- _____ Start _____ Stop _____
- _____ Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
- _____ Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
- _____ Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
- _____ Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
- _____ Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
- _____ Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
- _____ Note condition of the silica gel impinger. _____ % spent
- _____ Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
- _____ Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
- _____ Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Issued: October 2018
Document reviewed biennially

Appendix F
ANALYTICAL REPORT

AECOM - Morrisville

1600 Perimeter Park Drive
Morrisville, NC 27560

SunCoke

Indiana Harbor Retest-Indiana Harbor, IN
Client Project # 60644323.03

Analytical Report (1020-130)

EPA Method 5

Particulate Matter

EPA Method 202

Condensable Particulate Matter



Enthalpy Analytical, LLC

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www.enthalpy.com
800-1 Capitola Drive Durham, NC 27713-4385

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 26 pages.



QA Review Performed by – Quentisha L. Forrester

Report Issued: 11/23/2020



Summary of Results



Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-1 EPA Method 5 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Summary Report

Sample ID	Net Filter Catch (mg)	Net Front Rinse (mg)	Total Particulate (mg)
Oven R1	28.140	71.180	99.3
Oven R2	228.730	99.550	328.3
Oven R3	65.200	45.892	111.1
Oven R4	20.860	44.842	65.7
PCM R1	-0.150	1.231	1.2
PCM R2	-0.430	0.793	0.8
PCM R3	0.140	0.911	1.1
QFF-RB Quartz Filter	-0.400		0.0

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-3 EPA Method 202 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Summary Report

	Oven R1	Oven R2	Oven R3	Oven R4	
Net Organic Catch (mg)	1.314	3.535	1.545	6.934	
Corrected Inorganic (mg)	40.036	26.827	48.695	58.586	
CPM (mg)	41.4	30.4	50.2	65.5	
TB Corrected CPM (mg)	39.4	28.4	48.2	63.5	
	PCM R1	PCM R2	PCM R3	FB	CPMF-RB
Net Organic Catch (mg)	2.311	2.688	1.465	1.271	0.149
Corrected Inorganic (mg)	3.270	2.722	5.321	2.173	0.170
CPM (mg)	5.6	5.4	6.8	3.4	0.3
TB Corrected CPM (mg)	3.6	3.4	4.8		

Results

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-1 EPA Method 5 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Results

	Oven R1		Oven R2		Oven R3		Oven R4	
Filter ID	023875		023876		023877		023878	
Final Weight 1 (g)	0.53256	11/19/20 06:34	0.74524	11/19/20 06:35	0.57505	11/19/20 06:38	0.52758	11/19/20 06:39
Final Weight 2 (g)	0.53301	11/20/20 09:35	0.74569	11/20/20 09:51	0.57529	11/20/20 09:55	0.52804	11/20/20 09:58
Tare (g)	0.50487	9/23/20 08:37	0.51696	9/23/20 08:38	0.51009	9/23/20 08:38	0.50718	9/23/20 08:39
Net Filter Catch (mg)	28.14		228.73		65.20		20.86	
Beaker No.	28958		28959		28960		28961	
Weight 1 (g)	2.571462	11/19/20 07:00	2.60114	11/19/20 07:00	2.550817	11/19/20 07:01	2.561917	11/19/20 07:04
Weight 2 (g)	2.571525	11/20/20 10:19	2.60118	11/20/20 10:20	2.550785	11/20/20 10:20	2.561933	11/20/20 10:21
Tare (g)	2.500266	11/6/20 10:33	2.501514	11/6/20 10:33	2.504821	11/6/20 10:33	2.517035	11/6/20 10:37
Acetone Volume (mL)	86		126		78		61	
Acetone Blank (g)	0.00008		0.00012		0.00007		0.00006	
Net Front Rinse (mg)	71.18		99.55		45.89		44.84	
Total Particulate (mg)	99.32		328.28		111.09		65.70	

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-1 EPA Method 5 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Results

	PCM R1		PCM R2		PCM R3		QFF-RB Quartz Filter	
Filter ID	023879		023881		023882		023880	
Final Weight 1 (g)	0.50574	11/19/20 06:49	0.50828	11/19/20 06:53	0.51042	11/19/20 06:54	0.51086	11/19/20 06:56
Final Weight 2 (g)	0.50538	11/20/20 10:00	0.50827	11/20/20 10:04	0.51035	11/20/20 10:05	0.51087	11/20/20 10:07
Tare (g)	0.50553	9/23/20 08:40	0.5087	9/23/20 08:41	0.51021	9/23/20 08:42	0.51127	9/23/20 08:40
Net Filter Catch (mg)	-0.15		-0.43		0.14		-0.40	
Beaker No.	28962		28963		28964			
Weight 1 (g)	2.507471	11/19/20 07:05	2.498919	11/19/20 07:08	2.528436	11/19/20 07:09		
Weight 2 (g)	2.507486	11/20/20 10:22	2.498922	11/20/20 10:23	2.528431	11/20/20 10:25		
Tare (g)	2.506175	11/6/20 10:37	2.498071	11/6/20 10:38	2.527424	11/6/20 10:38		
Acetone Volume (mL)	87		63		104			
Acetone Blank (g)	0.00008		0.00006		0.00010			
Net Front Rinse (mg)	1.23		0.79		0.91			
Total Particulate (mg)	1.23		0.79		1.05		0.00	

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-1 EPA Method 5 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Reagent Blanks

In House		Acetone	
Beaker		28992	
Weight 1 (g)	2.507726	11/19/20 07:36	
Weight 2 (g)	2.507619	11/20/20 11:04	
Tare	2.507511	11/6/20 10:50	
Residue (g)	0.00011		
Vol. (mL)	200		
Max. Residue	0.00158		

Reagent Blank		Acetone	
Beaker		28990	
Weight 1 (g)	2.518831	11/19/20 07:35	
Weight 2 (g)	2.518814	11/20/20 11:03	
Tare	2.518656	11/6/20 10:48	
Residue (g)	0.00016		
Vol. (mL)	172		
Max. Residue	0.00136		

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-3 EPA Method 202 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Results

	Oven R1		Oven R2		Oven R3		Oven R4	
Beaker Number	28981		28982		28983		28984	
Initial Solvent Volume (mL)	82		45		44		51	
Org. Final Weight 1 (g)	2.508055	11/19/20 07:24	2.524708	11/19/20 07:25	2.518175	11/19/20 07:26	2.500611	11/19/20 07:27
Org. Final Weight 2 (g)	2.508067	11/20/20 10:56	2.524732	11/20/20 10:57	2.518208	11/20/20 10:57	2.500432	11/20/20 10:58
Tare (g)	2.506753	11/6/20 10:45	2.521197	11/6/20 10:45	2.516663	11/6/20 10:45	2.493498	11/6/20 10:46
Organic Catch (mg)	1.31		3.54		1.55		6.93	
Inorganic								
Beaker Number	28970		28971		28972		28973	
Weight 1 (g)	2.554316	11/19/20 07:11	2.537429	11/19/20 07:12	2.570108	11/19/20 07:12	2.583992	11/19/20 07:13
Weight 2 (g)	2.554327	11/20/20 10:32	2.537459	11/20/20 10:38	2.570110	11/20/20 10:39	2.584003	11/20/20 10:40
Tare (g)	2.500769	11/6/20 10:40	2.502219	11/6/20 10:40	2.505884	11/6/20 10:41	2.505083	11/6/20 10:41
Initial Water Vol. (mL)	268		234		256		230	
Water Added by Lab (mL)	75		75		75		75	
Resuspend Vol. (mL)	100		100		100		100	
Net Inorganic Catch (mg)	53.56		35.24		64.23		78.92	
Titrant Normality	0.10		0.10		0.10		0.10	
Titrant Vol. (mL)	8.00		5.00		9.18		12.00	
Titrant Blank Vol. (mL)	0.06		0.06		0.06		0.06	
Ammonium Corr. (mg)	13.52		8.41		15.53		20.33	
Corrected Inorganic (mg)	40.04		26.83		48.69		58.59	
Condensable Particulate (mg)	41.35		30.36		50.24		65.52	
TB Corrected CPM (mg)	39.35		28.36		48.24		63.52	

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-3 EPA Method 202 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Results

	PCM R1		PCM R2		PCM R3		FB	
Beaker Number	28985		28986		28987		28988	
Initial Solvent Volume (mL)	22		66		92		68	
Org. Final Weight 1 (g)	2.491018	11/19/20 07:28	2.516975	11/19/20 07:28	2.513828	11/19/20 07:29	2.477978	11/19/20 07:29
Org. Final Weight 2 (g)	2.490953	11/20/20 10:58	2.516936	11/20/20 10:58	2.513781	11/20/20 10:59	2.477951	11/20/20 10:59
Tare (g)	2.488642	11/6/20 10:46	2.514248	11/6/20 10:47	2.512316	11/6/20 10:47	2.476680	11/6/20 10:48
Organic Catch (mg)	2.31		2.69		1.47		1.27	
Inorganic								
Beaker Number	28974		28975		28976		28977	
Weight 1 (g)	2.506141	11/19/20 07:14	2.510098	11/19/20 07:15	2.500038	11/19/20 07:16	2.492026	11/19/20 07:17
Weight 2 (g)	2.506164	11/20/20 10:41	2.510092	11/20/20 10:41	2.500036	11/20/20 10:42	2.492167	11/20/20 10:43
Tare (g)	2.502894	11/6/20 10:42	2.507370	11/6/20 10:42	2.494017	11/6/20 10:43	2.489994	11/6/20 10:43
Initial Water Vol. (mL)	217		216		158		113	
Water Added by Lab (mL)	75		75		75		75	
Resuspend Vol. (mL)	100		100		100		100	
Net Inorganic Catch (mg)	3.27		2.72		6.02		2.17	
Titrant Normality	0.10		0.10		0.10		0.10	
Titrant Vol. (mL)	0.09		0.08		0.47		0.07	
Titrant Blank Vol. (mL)	0.06		0.06		0.06		0.06	
Ammonium Corr. (mg)	0.00		0.00		0.70		0.00	
Corrected Inorganic (mg)	3.27		2.72		5.32		2.17	
Condensable Particulate (mg)	5.58		5.41		6.79		3.44	
TB Corrected CPM (mg)	3.58		3.41		4.79			

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-3 EPA Method 202 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Results

CPMF-RB			
Beaker Number	28989		
Initial Solvent Volume (mL)	0		
Org. Final Weight 1 (g)	2.512536	11/19/20 07:33	
Org. Final Weight 2 (g)	2.512641	11/20/20 11:02	
Tare (g)	2.512492	11/6/20 10:48	
Organic Catch (mg)	0.15		
Inorganic			
Beaker Number	28978		
Weight 1 (g)	2.510110	11/19/20 07:20	
Weight 2 (g)	2.510153	11/20/20 10:44	
Tare (g)	2.509983	11/6/20 10:44	
Initial Water Vol. (mL)	0.0001		
Water Added by Lab (mL)	75		
Resuspend Vol. (mL)	100		
Net Inorganic Catch (mg)	0.17		
Titrant Normality	0.10		
Titrant Vol. (mL)	0.06		
Titrant Blank Vol. (mL)	0.06		
Ammonium Corr. (mg)	0.00		
Corrected Inorganic (mg)	0.17		
Condensable Particulate (mg)	0.32		
TB Corrected CPM (mg)			

Enthalpy Analytical

Company: AECOM - Morrisville

Job No.: 1020-130-3 EPA Method 202 Analysis

Client No.: 60644323.03 Site: SunCoke Indiana Harbor Retest-Indiana Harbor, IN

Reagent Blanks

In House

	Hexane		Acetone		Water	
Beaker	28993		28992		28980	
Weight 1 (g)	2.524433	11/19/20 07:36	2.507726	11/19/20 07:36	2.482330	11/19/20 07:23
Weight 2 (g)	2.524474	11/20/20 11:05	2.507619	11/20/20 11:04	2.482463	11/20/20 10:47
Tare (g)	2.524385	11/6/20 10:50	2.507511	11/6/20 10:50	2.482264	11/6/20 10:44
Residue (g)	0.00009		0.00011		0.00020	
Vol. (mL)	225		200		250	
Max. Residue (g)	0.00015		0.00016		0.00025	

Reagent Blank

	Hexane		Acetone		Water	
Beaker	28991		28990		28979	
Weight 1 (g)	2.505146	11/19/20 07:35	2.518831	11/19/20 07:35	2.500635	11/19/20 07:22
Weight 2 (g)	2.505108	11/20/20 11:03	2.518814	11/20/20 11:03	2.500711	11/20/20 10:45
Tare (g)	2.504940	11/6/20 10:49	2.518656	11/6/20 10:48	2.500280	11/6/20 10:44
Residue (g)	0.00017		0.00016		0.00043	
Vol. (mL)	176		172		178	
Max. Residue (g)	0.00012		0.00014		0.00018	

Narrative Summary



Enthalpy Analytical Narrative Summary

Company	AECOM - Morrisville
Analyst	CCB
Parameters	EPA Method 5

Client #	60644323.03
Job #	1020-130
# Samples	7 and Blanks

Custody

Alyssa Miller received the samples on 11/9/20 after being relinquished by AECOM of Morrisville, NC. The samples were received at 20.4 °C respectively, and they were in good condition.

Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Analysis

The samples were analyzed for particulate matter using the analytical procedures in EPA Method 5, Determination of Particulate Matter Emissions from Stationary Sources (40 CFR Part 60, Appendix A).

The filter fractions were weighed on Balance 2 (Mettler Model AB265-S, Serial # 1125163272) and the rinse fractions were weighed on Balance 8 (Sartorius Model ME 5-F, Serial # 23104965). Each balance is certified by Mettler Toledo through July 31, 2021.

QC Notes

The catch weights were adjusted by a corresponding reagent blank correction value. A mathematically determined (theoretical) maximum value was calculated and compared with the actual value measured for the blank. The lower of the two values was used as the blank correction value, which was then factored by the sample volume divided by the blank volume, and subtracted from the sample catch weight.

The client's Method 202 acetone blank was used to adjust the rinse fraction results as described above.

A laboratory acetone reagent blank was also dried with the samples, but has not been used to adjust any of the sample results.

The client also provided a Filter Blank (*QFF-RB Quartz Filter*) which was dried, weighed, and reported with the samples (page 8 of this PDF), but which has not been used to adjust any of the sample results.



Enthalpy Analytical Narrative Summary (continued)

Reporting Notes

Enthalpy considers gravimetric analyses accurate to ± 0.5 mg. Negative results are displayed as measured, but treated as zero when calculating total results. Results below -0.5 mg are also investigated. There were no negative values calculated in this project. However, filters 023879 and 023881 had visible particulate with weights between 0 and -0.5 mg.

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

The results presented in this report are representative of the samples as provided to the laboratory.



Enthalpy Analytical Narrative Summary

Company	AECOM - Morrisville
Analyst	CCB
Parameters	EPA Method 202

Client #	60644323.03
Job #	1020-130
# Samples	8 and Blanks

Custody

Alyssa Miller received the samples on 11/9/20 after being relinquished by AECOM of Morrisville, NC. The samples were received at 20.4 °C respectively, and they were in good condition.

Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Analysis

The samples were analyzed for Condensable Particulate Matter using the analytical procedures in EPA Method 202, Determination of Condensible Particulate Emissions from Stationary Sources (40 CFR Part 51, Appendix M).

All samples were weighed on Balance 8 (Sartorius Model ME 5-F, Serial # 23104965), certified by Mettler Toledo through July 31, 2021.

QC Notes

A field (train) blank was received and analyzed with these samples. The method specifies that blank corrections are accomplished by subtracting the particulate mass determined for the 'Field Train Blank' or 2 mg (whichever is less) from the sample weight.

Acetone, water, and hexane reagent blanks were received and analyzed with these samples. Laboratory reagent blanks were also dried down with these samples. Results are reported for all these blanks, but none are used to blank correct the associated sample results.

A CPM Filter blank was also received with these samples. It was extracted with hexane and water, and then the water extract was extracted with hexane. The hexane layers were combined and dried down together, and the water extract was dried down separately. The CPM Filter Blank results were not used to adjust any of the sample results.

The inorganic results for the samples were corrected for the ammonium ions used to precipitate the sulfate, per the formula in the Method (Section 12.2.1).



Enthalpy Analytical Narrative Summary (continued)

Reporting Notes

Enthalpy considers gravimetric analyses accurate to ± 0.5 mg. Negative results are displayed as measured, but treated as zero when calculating total results. Results below -0.5 mg are also investigated. There were no negative values calculated in this project.

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

The results presented in this report are representative of the samples as provided to the laboratory.



General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC data reports, unless specifically noted otherwise.

- Any analysis which refers to the method as “**Type**” represents a planned deviation from the reference method. For instance a Hydrogen Sulfide assay from a Tedlar bag would be labeled as “EPA Method 16-Type” because Tedlar bags are not mentioned as one of the collection options in EPA Method 16.
- The acronym **MDL** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.
- The acronym **LOQ** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.
- The acronym **ND** following a value indicates a non-detect or analytical result below the MDL.
- The letter **J** in the Qualifier or Flag column in the results indicates that the value is between the MDL and the LOQ. The laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.
- The letter **E** in the Qualifier or Flag column indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.
- Sample results are presented ‘as measured’ for single injection methodologies, or an average value if multiple injections are made. If all injections are below the MDL, the sample is considered non-detect and the ND value is presented. If one, but not all, are below the MDL, the MDL value is used for any injections that are below the MDL. For example, if the MDL is 0.500 and LOQ is 1.00, and the instrument measures 0.355, 0.620, and 0.442 - the result reported is the average of 0.500, 0.620, and 0.500 - - i.e. 0.540 with a J flag.
- When a spike recovery (Bag Spike, Collocated Spike Train, or liquid matrix spike) is being calculated, the native (unspiked) sample result is used in the calculations, as long as the value is above the MDL. If a sample is ND, then 0 is used as the native amount (not the MDL value).
- The acronym **DF** represents Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.
- The addition of **MS** to the Sample ID represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. The MS analysis indicates what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix interferes with the analysis of the analyte(s).



General Reporting Notes

(continued)

- The addition of **MSD** to the Sample ID represents a Matrix Spike Duplicate. Prepared in the same manner as a MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times.
- The addition of **LD** to the Sample ID represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results of the duplicate analysis are compared to the initial result. The result should have a difference value of within 10% of the initial result (if the results of the original analysis are greater than the LOQ).
- The addition of **AD** to the Sample ID represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.
- The Sample ID **LCS** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our client projects, two spikes are retained as LCSs. The LCSs are labeled with the associated project number and kept in-house at the appropriate temperature conditions. When the project samples are received for analysis, the LCSs are analyzed to confirm that the analyte could be recovered from the media, separate from the samples which were used on the project and which may have been affected by source matrix, sample collection, and/or sample transport.
- **Significant Figures:** Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units, rather than to 3 significant figures. For example, a value of 10,456.45 ug cat ch is rounded to 10,456 ug. There are five significant digits displayed, but no confidence should be placed on more than two significant digits. In the case of small numbers, generally 3 significant figures are presented, but still only 2 should be used with confidence. Many neat materials are only certified to 3 digits, and as the mathematically correct final result is always 1 digit less than all its pre-cursors - 2 significant figures are what are most defensible.
- **Manual Integration:** The data systems used for processing will flag manually integrated peaks with an "M". There are several reasons a peak may be manually integrated. These reasons will be identified by the following two letter designations on sample chromatograms, if provided in the report. The peak was *not integrated* by the software "NI", the peak was *integrated incorrectly* by the software "II" or the *wrong peak* was integrated by the software "WP". These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.



Sample Custody





Chain of Custody Record

Page 1 of 4

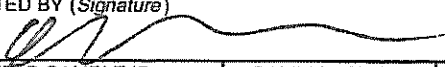



PROJECT			# OF CONTAINERS	ANALYSES								METHOD 5/202			
Indiana Harbor Retest 60644323.03				M5 Gravimetric PM	Method 202 CPM										
COLLECTED BY (Signature)															
FIELD SAMPLE ID	SAMPLE MATRIX	DATE/TIME											REMARKS	ID NO. (lab use only)	
IHO-Oven-M5/202-C1-R1	Quartz Fiber Filter	11/3 12:00	1	X											
IHO-Oven-M5/202-C1-R2	Quartz Fiber Filter	1 15:05	1	X											
IHO-Oven-M5/202-C1-R3	Quartz Fiber Filter	1 17:00	1	X											
IHO-Oven-M5/202-C1-R4	Quartz Fiber Filter	11/4 7:45	1	X											
IHO-Oven-M5/202-C5-R1	Teflon Filter	11/3 12:00	1		X										
IHO-Oven-M5/202-C5-R2	Teflon Filter	1 15:05	1		X										
IHO-Oven-M5/202-C5-R3	Teflon Filter	1 17:00	1		X										
IHO-Oven-M5/202-C5-R4	Teflon Filter	11/4 7:45	1		X										
IHO-PCM-M5/202-C1-R1	Quartz Fiber Filter	11/4 15:46	1	X											
IHO-PCM-M5/202-C1-R2	Quartz Fiber Filter	1 17:28	1	X											
IHO-PCM-M5/202-C1-R3	Quartz Fiber Filter	1 19:25	1	X											
IHO-PCM-M5/202-C5-R1	Teflon Filter	1 15:46	1		X										
IHO-PCM-M5/202-C5-R2	Teflon Filter	1 17:28	1		X										
IHO-PCM-M5/202-C5-R3	Teflon Filter	1 19:25	1		X										
REMARKS												PROJECT #	RELINQUISHED BY	DATE	TIME
												60644323.03		11/9/20	11:39
RECEIVED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	
	11/9/20	11:38		11/9/20	12:30										


RECEIVED FOR LABORATORY BY	DATE	TIME	AIRBILL#	OPENED BY	DATE	TIME	TEMP (degC)	SEAL #	CONDITION
	11-09-20	1230							
REMARKS									
20.4°C Rayer 1, good condition Amm3 11-09-20									



Chain of Custody Record

Page 3 of 4

PROJECT Indiana Harbor Retest 60644323.03			# OF CONTAINERS	ANALYSES								METHOD 5/202					
Indiana Harbor, IN				M5 Gravimetric PM	Method 202 CPM												
COLLECTED BY (Signature) 																	
FIELD SAMPLE ID	SAMPLE MATRIX	DATE/TIME															
IHO-PCM-M5/202-C2-R1	Acetone	11/4 15:46	1	X													
IHO-PCM-M5/202-C2-R2	Acetone	17:28	1	X													
IHO-PCM-M5/202-C2-R3	Acetone	19:25	1	X													
IHO-PCM-M5/202-C3-R1	Water	15:46	1		X												
IHO-PCM-M5/202-C3-R2	Water	17:28	1		X												
IHO-PCM-M5/202-C3-R3	Water	19:25	1		X												
IHO-PCM-M5/202-C4-R1	Acetone/Hexane	15:46	1		X												
IHO-PCM-M5/202-C4-R2	Acetone/Hexane	17:28	1		X												
IHO-PCM-M5/202-C4-R3	Acetone/Hexane	19:25	1		X												
REMARKS												PROJECT # 60644323.03	RELINQUISHED BY 	DATE 11/9/20	TIME 11:35		
RECEIVED BY 	DATE 11/9/20	TIME 11:38	RELINQUISHED BY 	DATE 11/9/20	TIME 12:30	RECEIVED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME						

RECEIVED FOR LABORATORY BY 	DATE 11-09-20	TIME 1230	AIRBILL#	OPENED BY	DATE	TIME	TEMP (degC)	SEAL #	CONDITION
REMARKS 20.4° C Raytek 7, good condition Armm 3 11-09-20									



Chain of Custody Record

Page 4 of 4

PROJECT			# OF CONTAINERS	ANALYSES								METHOD 5/202	
Indiana Harbor Retest 60644323.03				M5 Gravimetric PM	Method 202 CPM								
COLLECTED BY (Signature)													
FIELD SAMPLE ID	SAMPLE MATRIX	DATE/TIME										REMARKS	ID NO. (lab use only)
IHO-M5/202-C2-FB	Water	11/4/14:00	1		X							Field Recovery Blank	
IHO-M5/202-C3-FB	Acetone/Hexane	11/4/14:00	1		X							Field Recovery Blank	
IHO-M5/202-C4-FB	Teflon Filter	11/4/14:00	1		X							Field Recovery Blank	
IHO-M5-QFF-RB	Quartz Fiber Filter	11/4/8:00	1	X								Reagent Blank	
IHO-M5/202-H2O-RB	Water	11/3/14:00	1		X							Reagent Blank	
IHO-M202-Ace-RB	Acetone	11/3/14:00	1	X	X							Reagent Blank	
IHO-M202-Hex-RB	Hexane	11/3/14:00	1		X							Reagent Blank	
IHO-M202-CPMF-RB	Teflon Filter	11/4-8:00	1		X							Reagent Blank	
REMARKS													
PROJECT # 60644323.03										RELINQUISHED BY	DATE	TIME	
RECEIVED BY										RELINQUISHED BY	DATE	TIME	
DATE										DATE	DATE	DATE	
TIME										TIME	TIME	TIME	
RECEIVED FOR LABORATORY BY													
DATE													
TIME													
AIRBILL#													
OPENED BY													
DATE													
TIME													
TEMP (degC)													
SEAL #													
CONDITION													
REMARKS													
20.4°C Raytek 7, good condition Amm 3 11-09-20													

**This Is The Last Page
Of This Report.**



Appendix G
CALIBRATION INFORMATION

Facility Calibration Error

Applicable to performance of calibration error of facility instruments in support of performance specification testing

May be used for Absolute Calibration Audit for EPA Methods 3A, 6C, 7E and 10

Project Name	Suncoke IN Harbor Refinery
Project Number	6064432203
Facility	INDIANA HARBOUR IN
Source	PCMA/RCA/Aven Vent A-3
Date	11/4/2020
Time	13:30
Operator	C. Thompson
Parameter	O ₂ /CO ₂
Analyzer Make and Model	CAF 602P
Analyzer Name	D09012-M
Analyzer Range	0 ² / ₂₅ / 38 ⁰² (ppm or %)

	Run Number	Time	Calibration Value	Monitor Response	Difference		
					Zero/Low	Mid	High
O ₂ -	1 - Zero/Low	13:30	0.0	0.00	0.0		
	2 - Mid SPAN	13:32	23.11	23.12			0.01
	3 - High Mid	13:36	10.03	10.03		0.06	
	4 - Mid		16.09				
CO ₂ -	5 - Zero/Low	13:30	0.0	0.0	0.0		
	6 - High	13:32	20.79	20.8			0.01
	7 - Zero/Low Mid	13:36	10.05	10.0		0.05	
	8 - Mid						
	9 - High						
Mean Difference =							
Calibration Error =							

	Cylinder Number	Actual Value
High	CC18200	23.11% O ₂ / 20.79% CO ₂
Mid	CC145292	10.07% O ₂ / 10.05% CO ₂
Zero/Low	UPN-TCJA AM63	ONE - 0.0

Project Name	Suncoke CNH Motor Retest	Page	1 of 1
Project Number	60644J27.03	Operator	C. Thompson
Facility	INDIANA Harbor, IN	Source 1	Open Vent A-3
Date	11/3-4/2008 Nov. 3.5.2008	Source 2	PCM Car A-11

Activity	Method	Criterion	Initials	
Calibration Error (CE)	3A, 6C, 7E, 10	Gas within $\pm 2.0\%$ of calibration span (or $\pm 0.5\%$ for O ₂ or CO ₂)	Span gas	CT
			Mid-range gas	CT
			Zero gas	CT
	25A	Gas within 5% of certified value	Low-range gas	N/A
			Mid-range gas	
			Span gas	
System Bias Check	3A, 6C, 7E, 10	Gas thru system agrees with CE value within $\pm 5.0\%$ of cal span ($\pm 0.5\%$ for O ₂ or CO ₂)	Upscale Gas	
			Zero gas	

Activity	Method	Criterion		Initials
System Bias Check	3A, 6C, 7E, 10	Gas thru system agrees with CE value within $\pm 5.0\%$ of cal span ($\pm 0.5\%$ for O ₂ or CO ₂)	Upscale Gas	N/A
			Zero Gas	I
Sample Flow Rate	3A, 6C, 7E, 10	Sample flow rate within 10% of flow rate from response time check and bias check		CT
Post-Test Calibration Drift Check	3A, 6C, 7E, 10	Gas reading within $\pm 3.0\%$ of calibration span of pre-test reading ($\pm 0.5\%$ for O ₂ or CO ₂)	Upscale gas	CT
			Zero Gas	CT
	25A	Selected gas reading within $\pm 3\%$ of span of pre-test reading	Upscale gas	I
			Zero Gas	I
Hourly Calibration Drift Check	25A	Selected gas reading within $\pm 3\%$ of span of pre-test reading	Upscale gas	I
			Zero Gas	I

[illegible]

¹ "Turn On Analyzers" is to document sufficient warm-up time. If applicable, "yesterday" is an acceptable entry.

Comments

FDS-01A CEMS Operation
Per EM SOP-016, SOP-027, SOP-028, SOP-029, SOP-037
Issued: August 2019
Document reviewed biennially



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

URS CORP
900 PERIMETER PARK DRIVE
MORRISVILLE NC 27560

Certificate Issuance Date: 08/28/2019

Praxair Order Number: 84657458

Part Number: NI CD20031E-AS

Customer PO Number: 60597573 02

Fill Date: 08/19/2019

Lot Number: 301603231901

Cylinder Style & Outlet: AS

CGA 590

Cylinder Pressure and Volume: 2000 psig 157 ft3

Certified Concentration

Expiration Date:	08/28/2027	NIST Traceable
Cylinder Number:	CC18200	Expanded Uncertainty
20.79 %	Carbon dioxide	± 0.5 %
23.11 %	Oxygen	± 0.2 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 08/28/2019

Term: 96 Months

Expiration Date: 08/28/2027

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component:

Carbon dioxide

Requested Concentration: 20 %
Certified Concentration: 20.79 %
Instrument Used: HORIBA VIA-510
Analytical Method: NDIR
Last Multipoint Calibration: 08/02/2019

First Analysis Data:				Date
Z:	R:	C:	Conc:	
0	19.75	20.78	20.77	08/27/2019
19.76	0	20.8	20.79	
0	20.82	19.76	20.81	
UOM: %				Mean Test Assay: 20.79 %

Reference Standard:

Type / Cylinder #: GMIS / CC102926

Concentration / Uncertainty: 19.75 % ± 0.25 %

Expiration Date: 03/30/2023

Traceable to: SRM # / Sample # / Cylinder #: 2745 / 9-C-34 / CAL016129

SRM Concentration / Uncertainty: 15.633 % / ± 0.037 %

SRM Expiration Date: 02/07/2025

Second Analysis Data:

Z:	R:	C:	Conc:	Date
0	0	0	0	
0	0	0	0	
0	0	0	0	
UOM: %				Mean Test Assay: %

2. Component:

Oxygen

Requested Concentration: 22.5 %
Certified Concentration: 23.11 %
Instrument Used: SIEMENS OXYMAT 5F
Analytical Method: Paramagnetic
Last Multipoint Calibration: 08/02/2019

First Analysis Data:				Date
Z:	R:	C:	Conc:	
0	23.18	23.12	23.11	08/27/2019
23.18	0	23.12	23.11	
0	23.12	23.2	23.11	
UOM: %				Mean Test Assay: 23.11 %

Reference Standard:

Type / Cylinder #: GMIS / ND20825

Concentration / Uncertainty: 23.18 % ± 0.121 %

Expiration Date: 05/07/2023

Traceable to: SRM # / Sample # / Cylinder #: 2659a / 71-E-24 / FF18300

SRM Concentration / Uncertainty: 20.863 % / ± 0.021 %

SRM Expiration Date: 08/23/2021

Second Analysis Data:

Z:	R:	C:	Conc:	Date
0	0	0	0	
0	0	0	0	
0	0	0	0	
UOM: %				Mean Test Assay: %

Analyzed By

Remzy Jemal

Certified By

Megha Patel



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

URS CORP
900 PERIMETER PARK DRIVE
MORRISVILLE NC 27560

Certificate Issuance Date: 08/19/2020

Praxair Order Number: 21923931

Part Number: NI CD10010E-AS

Customer PO Number: 60597573.02

Fill Date: 08/12/2020

Lot Number: 301619225004

Cylinder Style & Outlet: AS

CGA 590

Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	08/19/2028	NIST Traceable
Cylinder Number:	CC145292	Expanded Uncertainty
10.05 %	Carbon dioxide	± 0.4 %
10.09 %	Oxygen	± 0.4 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 08/19/2020

Term: 96 Months

Expiration Date: 08/19/2028

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Carbon dioxide

Requested Concentration: 10 %
Certified Concentration: 10.05 %
Instrument Used: HORIBA VIA-510
Analytical Method: NDIR
Last Multipoint Calibration: 08/14/2020

First Analysis Data:				Date
Z:	0	R:	9.97	08/19/2020
C:	10.03	Conc:	10.05	
R:	9.97	Z:	0	
C:	10.03	Conc:	10.05	
Z:	0	C:	10.03	
R:	9.97	Conc:	10.05	
UOM:	%	Mean Test Assay:	10.05	%

Reference Standard: Type / Cylinder #: GMIS / CC43746

Concentration / Uncertainty: 9.99 % ± 0.309%

Expiration Date: 09/30/2023

Traceable to: SRM # / Sample # / Cylinder #: 2745 / 9-C-34 / CAL016129

SRM Concentration / Uncertainty: 15.633% / ± 0.037 %

SRM Expiration Date: 02/07/2025

Second Analysis Data:				Date
Z:	0	R:	0	
C:	0	Conc:	0	
R:	0	Z:	0	
C:	0	Conc:	0	
Z:	0	C:	0	
R:	0	Conc:	0	
UOM:	%	Mean Test Assay:		%

2. Component: Oxygen

Requested Concentration: 10 %
Certified Concentration: 10.09 %
Instrument Used: SIEMENS OXYMAT 5F
Analytical Method: Paramagnetic
Last Multipoint Calibration: 08/14/2020

First Analysis Data:				Date
Z:	0	R:	9.88	08/19/2020
C:	10.06	Conc:	10.11	
R:	9.86	Z:	0	
C:	10.04	Conc:	10.09	
Z:	0	C:	10.04	
R:	9.88	Conc:	10.09	
UOM:	%	Mean Test Assay:	10.09	%

Reference Standard: Type / Cylinder #: GMIS / CC232208

Concentration / Uncertainty: 9.92 % ± 0.21%

Expiration Date: 02/14/2023

Traceable to: SRM # / Sample # / Cylinder #: 2659a / 71-E-24 / FF18300

SRM Concentration / Uncertainty: 20.863% / ± 0.021 %

SRM Expiration Date: 08/23/2021

Second Analysis Data:				Date
Z:	0	R:	0	
C:	0	Conc:	0	
R:	0	Z:	0	
C:	0	Conc:	0	
Z:	0	C:	0	
R:	0	Conc:	0	
UOM:	%	Mean Test Assay:		%

Analyzed By

Remzy Jemal

Certified By

Megha Patel

SunCoke/Indiana Harbor

11/4/2020

PCM A/B - 202B

Post Test Meter Calibration Check

Meter No. SC-M1554

Per EPA EMTIC Guideline Document 26:

Alternative Post-Test Calibration

Run	Post Test Meter QA (γ_{qa})
1	1.0099
2	1.0159
3	1.0194
Average	1.0151
Initial Meter γ	1.0100
Deviation	0.5%

Must be less than 5%



Calibration complies with ISO/IEC
17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 6530-11190635

Traceable® Certificate of Calibration for Digital Barometer

Manufactured for and distributed by : Thomas Scientific Box 99,99 High Hill Road, Swedeboro, NJ, 08085-0099, U.S.A.

BM - 2001

Instrument Identification:

Model: 1189R03,

S/N: 200202233

Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	01 Nov 2020	1000447551
Digital Thermometer	130070752	10 Mar 2021	4000-11170557
Chilled Mirror Hygrometer	44654/2H3737	25 Nov 2021	17811
Climate Chamber	W619.0019		

Certificate Information:

Technician: 57

Procedure: CAL-31

Cal Date: 23 Mar 2020

Cal Due Date: 23 Mar 2022

Test Conditions: 62.85%RH 22.44°C 1018mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	N.A.	N.A.		50.38	52	Y	47	53	0.74	>4:1
°C	N.A.	N.A.		24.97	24.8	Y	24.57	25.37	0.05	>4:1
mb/hPa	N.A.	N.A.		805.85	805	Y	802	810	0.62	>4:1
mb/hPa	N.A.	N.A.		909.75	909	Y	906	914	0.62	>4:1
mb/hPa	N.A.	N.A.		1011.15	1011	Y	1007	1015	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio;
Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) - Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Marisa Elms

Marisa Elms, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 23 Mar 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-ANAB.
International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).

Calibration Data Sheet - Calipers

Caliper ID Number	CAL - M1504
-------------------	-------------

Calibrated by	Initials	JFM
	Date	3/19/2019
Reviewed by	Initials	CMT
	Date	3/20/2019

Calibration Expires (2 years after calibration)	3/19/2021
--	-----------

Ring Gauge	ID Number	GH0378		
	Diameter (in.)	0.24000 inches		
	Expiration Date	11/25/2019		
Caliper	Replicate	Measurement (in)	Error (%)	
	1	0.2398	-0.08	%
	2	0.2395	-0.21	%
	3	0.2399	-0.04	%

Ring Gauge	ID Number	GH3746		
	Diameter (in.)	0.34995 inches		
	Expiration Date	12/18/2019		
Caliper	Replicate	Measurement (in)	Error (%)	
	1	0.34982	-0.21	%
	2	0.34998	-0.04	%
	3	0.3500	0.01	%

$$\text{Error} = \left(\frac{\text{Measured} - \text{Standard}}{\text{Standard}} \right) \times 100\%$$

Error for each of the three determinations must be within $\pm 2\%$

CDS-18: Calipers
 Per: EM SOP-022
 Revised: June 2018
 Document reviewed biennially

Last 5-point Calibration	Date	10-2-19
	Y _D	0.9869
	ΔH@	1.8686
Date of Last Temperature Cal		10-4-19

	Check console ID label is legible; replace if necessary	✓
	Check annual calibration label is legible; replace if necessary.	✓
	Make sure console has 4 rubber feet.	✓
	Spare manometer oil in rear of console box.	✓
Fuses	Inspect for signs of melting, charring, or other issues. Replace if necessary	✓
	Correct fuses installed? Filter: 10 amp; Probe: 10 amp, Pump/AUX: 15 amp; Power: 5 amp.	✓
	Extra Fuses (5-15 Amp) in baggie	✓
	Empty and Replace Meter Oil Knockout jar	✓
	Check for oil in DGM lines. If oil is present, perform DGM leak check and then remove lines to flush out oil. Perform another DGM leak check after reinstalling lines.	✓
	Check manometer fluid levels are OK. Try to not have the adjustment valves close to one extreme or the other.	✓
	Leak Check – ΔH Manometer Positive	✓
	Leak Check – ΔH Manometer Negative	✓
	Leak Check – ΔP Manometer Positive	✓
	Leak Check – ΔP Manometer Negative	✓
	Inspect for broken components, loose knobs, missing screws.	✓
	Check that handle screws are tight	✓
	Inspect power cord for nicks, rubs, or separated plug. Replace as necessary.	✓
	Inspect female 120V receptacles (pump, aux) for signs of melting, charring or other issues. Replace as necessary.	✓
	General cleanliness of console.	✓

[illegible]


Power Switch Function		✓
Timer Function		✓
Confirm function of Orsat Pump		X
Probe Controller Function ¹ Use bench tester or umbilical and heat probe to at least 250°F		✓
Filter Controller Function ¹ Use bench tester or umbilical and heat probe to at least 250°F		✓
Pump Outlet Function plug pump in and turn on pump switch		✓
Aux Outlet Function Test power; replace fuse if necessary		✓
Temperature Readout Function. Test all 7 channels including "DGM Out". Replace selector switch if not functioning properly.		✓
DGM Leak Check	Negative: Plug Sample Inlet, Vac > 15" Hg Leak < 0.002 cfm	✓
	Positive: Using syringe, pressurize to > 5-8" H ₂ O Leak unchanging for 15 seconds	✓
Close Coarse Valve No loss of vacuum		✓
All valves open N-3 (#19) orifice, Vac > 17" H ₂ O * 1.32" Hg)		✓
Close manometer valves before placing console on ready shelf.		✓
Confirm Orifice Stopper Removed		✓
Confirm DGM TC Lead Connected		✓

¹ If console to be used for CCS, heat CCS probe and PM filter holder to 660°F

Console Calibration Check	Did field data (orifice alternative) confirm calibration?	Y / N / NA
	Was a 3-point calibration check performed?	Y / N / NA
	Did the 3-point calibration check confirm the data from the last full calibration?	Y / N / NA

NOTE: Calibration requires the following minima at each point:

10 minutes duration
5 cubic feet gas collection

Console Status	Good to go; Green Tag	
	In need of Repair; Red Tag and place in Repair Queue	

Scan and save scan form; log console repair and location

MCL-33: Console Inspection Checklist
Issued: January 2020
 Document reviewed biennially

Five-Point Dry Gas Meter Calibration (Against Critical Orifice)

Calibrated by	Initials	ESJ
	Date	10-28-20
Reviewed by	Initials	UTM
	Date	10/28/20

Console ID	SC-M1551
Maintenance Documented with MCL-33	①/N

Leak Check	(+)	✓
	(-)	✓

Thermometer ID	TM-1901
Thermometer Expiration Date	11-5-2020
Barometer ID	S/N: 200202233
Barometer Expiration Date	3-23-2022

034.735

		Run 1A	Run 1B	Run 2A	Run 2B	Run 3A	Run 3B	Run 4A	Run 4B	Run 5A	Run 5B
Critical Orifice	Identification Number	SN-13885-12		SN-13885-13		SN-13885-17		SN-13885-25		SN-13885-31	
	Expiration Date	3-16-21		3-16-21		3-16-21		3-16-21		3-16-21	
	K Factor	.3086		.3385		.4613		.6890		.8208	
Subject DGM	DGM Initial Reading (ft³)	174.307	185.677	82.658	97.661	034.739	055.128	195.650	213.035	111.454	151.785
	DGM Final Reading (ft³)	185.677	195.650	97.661	111.454	055.128	082.658	213.035	223.755	151.785	174.307
	Initial DGM Temperature (°F)	72	70	68.5	69	66	67.5	70	71.5	68.5	73.5
	Final DGM Temperature (°F)	70	70	69	68.5	67.5	68.5	71.5	72	73.5	72
Test Time (minutes)		20.5	25	34.5	31.75	34.5	46.5	19.5	12	38.25	21.25
Orifice Manometer, ΔH (H ₂ O)		.54	.55	.66	.66	1.3	1.3	2.8	2.7	3.8	3.9
Barometric Pressure (inHg)		29.66		29.61		29.60		29.68		29.62	
Ambient Temperature (°F)		68.5		69.9		69.8		67.6		69.8	
Pump Vacuum (inHg)		25	22	24	22.5	21.5	21	17	15.5	16.5	15

Notes:

CDS-04: DGM 5 point against orifice
Per: EM SOP-002
Issued: July 2019
Document reviewed biennially

Temperature Readout Calibration Isokinetic Sampling Consoles (using a Simulated Thermometer)

Readout ID Number

SC-M/551

Calibrated by:	Initials	ESJ
	Date	10-28-20
Reviewed by	Initials	JTM
	Date	10/28/20

Reference Thermometer	ID Number	TM-1901
	Calibration Exp Date	11-5-20
Reference Thermocouple	ID Number	S/N: WNW 0107130
	Calibration Exp Date	2-10-22
Thermometer Simulator	ID Number	TS-M/101
	Calibration Exp Date	3-31-21

Temperature Readout Calibration	
Reference Thermometer (°F)	68.7
Temperature Readout (°F)	68.8
Was Readout adjusted?	Y/N
Do these agree within 2°F	Y/N

Temperature Readout Linearity Check

Channel	Temperature (°F)		
	Theoretical	Observed	Difference ¹
1	10	-9	1
	0	0	0
	50	47	3
	100	97	3
	175	173	2
	250	249	1
	350	349	1
	500	498	2
	750	750	0
	1000	1000	0
	1500	1499	1
	1900	1900	0

Channel	Temperature (°F)		
	Theoretical	Observed	Difference ¹
2	40	39	1
	250	251	1
3	40	38	2
	250	250	0
4	40	36	4
	100	95	5
5	40	37	3
	100	96	4
6	40	38	2
	100	97	3
7	40	38	2
	100	97	3

¹ Difference is calculated as follows:

Difference = Observed - Theoretical

Acceptable difference is $\pm 5^\circ\text{F}$ for temperatures below 1000°F and $\pm 10^\circ\text{F}$ for temperatures above 1000°F

Are these met?

Y/N

Console / Dry Gas Meter Preparation Checklist

Date	10-28-20
Console/DGM ID	SC-M1554
Technician	ESJ
Most Recent Field Project	NA

Last 5-point Calibration	Date	8-1-20
	Yo	0.998
	ΔH@	1.995
Date of Last Temperature Cal		8-1-20

Check console ID label is legible; replace if necessary.		✓
Check annual calibration label is legible; replace if necessary.		✓
Make sure console has 4 rubber feet.		✓
Spare manometer oil in rear of console box.		✓
Fuses	Inspect for signs of melting, charring, or other issues. Replace if necessary.	✓
	Correct fuses installed? Filter: 10 amp; Probe: 10 amp, Pump/AUX: 15 amp; Power: 5 amp.	✓
	Extra Fuses (5-15 Amp) in baggie	✓
Empty and Replace Meter Oil Knockout jar		✓
Check for oil in DGM lines. If oil is present, perform DGM leak check and then remove lines to flush out oil. Perform another DGM leak check after reinstalling lines.		✓
Check manometer fluid levels are OK. Try to not have the adjustment valves close to one extreme or the other.		✓
Leak Check – ΔH Manometer Positive		✓
Leak Check – ΔH Manometer Negative		✓
Leak Check – ΔP Manometer Positive		✓
Leak Check – ΔP Manometer Negative		✓
Inspect for broken components, loose knobs, missing screws.		✓
Check that handle screws are tight		✓
Inspect power cord for nicks, rubs, or separated plug. Replace as necessary.		✓
Inspect female 120V receptacles (pump, aux) for signs of melting, charring or other issues. Replace as necessary.		✓
General cleanliness of console.		✓

Notes Filter heat controller does not display set point. Seems to stop heating at 300°F. Can combat this by unplugging TC to manually control temperature, as it did not continue to heat when TC was unplugged.

Power Switch Function		✓
Timer Function		✓
Confirm function of Orsat Pump		✓
Probe Controller Function ¹		✓
Use bench tester or umbilical and heat probe to at least 250°F		✓
Filter Controller Function ¹		✓
Use bench tester or umbilical and heat probe to at least 250°F		✓
Pump Outlet Function		✓
plug pump in and turn on pump switch		✓
Aux Outlet Function		✓
Test power; replace fuse if necessary		✓
Temperature Readout Function. Test all 7 channels including "DGM Out". Replace selector switch if not functioning properly.		✓
DGM Leak Check	Negative: Plug Sample Inlet, Vac > 15" Hg Leak < 0.002 cfm	✓
	Positive: Using syringe, pressurize to > 5-8" H ₂ O Leak unchanging for 15 seconds	✓
Close Coarse Valve		✓
No loss of vacuum		✓
All valves open		✓
N-3 (#19) orifice, Vac > 17" H ₂ O * 1.32" Hg		✓
Close manometer valves before placing console on ready shelf.		✓
Confirm Orifice Stopper Removed		✓
Confirm DGM TC Lead Connected		✓

¹ If console to be used for CCS, heat CCS probe and PM filter holder to 660°F

Console Calibration Check	Did field data (orifice alternative) confirm calibration?	Y / N / NA
	Was a 3-point calibration check performed?	Y / N / NA
	Did the 3-point calibration check confirm the data from the last full calibration?	Y / N / NA
NOTE: Calibration requires the following minima at each point:		
10 minutes duration		
5 cubic feet gas collection		

Console Status	Good to go; Green Tag	✓
	In need of Repair; Red Tag and place in Repair Queue	
Scan and save scan form; log console repair and location		

MCL-33: Console Inspection Checklist
Issued: January 2020
Document reviewed biennially

Five-Point Dry Gas Meter Calibration (Against Critical Orifice)

Calibrated by	Initials	ESJ
	Date	10-28-20
Reviewed by	Initials	JTM
	Date	10/28/20

Console ID	SC-M1554
Maintenance Documented with MCL-33	01N

Leak Check	(+)	✓
	(-)	✓

Thermometer ID	TM-1901
Thermometer Expiration Date	11-5-2020
Barometer ID	S/N: 200202233
Barometer Expiration Date	3-23-2022

		Run 1A	Run 1B	Run 2A	Run 2B	Run 3A	Run 3B	Run 4A	Run 4B	Run 5A	Run 5B
Critical Orifice	Identification Number	SN-13885 -12		SN-13885 -13		SN-13885 -17		SN-13885 -25		SN-13885 -31	
	Expiration Date	3-16-21		3-16-21		3-16-21		3-16-21		3-16-21	
	K Factor	.3086		.3385		.4613		.6890		.8208	
Subject DGM	DGM Initial Reading (ft³)	918.635	931.577	79.138	90.710	001.817	20.329	949.484	978.058	32.338	49.910
	DGM Final Reading (ft³)	931.577	949.484	90.710	100.30	20.329	32.338	978.058	001.817	49.910	79.138
	Initial DGM Temperature (°F)	65	66	71	68.5	69.5	68.5	67	68	68.5	70
	Final DGM Temperature (°F)	66	67	68.5	68	68.5	68.5	68	69.5	70	71
Test Time (minutes)		33	45.5	26.5	22	31.25	20.25	32.5	27	16.45	27.75
Orifice Manometer, ΔH (H ₂ O)		.53	.53	.66	.65	1.3	1.3	2.8	2.8	4	4
Barometric Pressure (in Hg)		29.60		29.68		29.62		29.61		29.66	
Ambient Temperature (°F)		69.8		67.6		69.8		69.9		68.5	
Pump Vacuum (in Hg)		22.5	22	22	22	20	20	18	18	16	16

Notes:

CDS-04: DGM 5 point against orifice
Per: EM SOP-002
Issued: July 2019
Document reviewed biennially

Temperature Readout Calibration Isokinetic Sampling Consoles (using a Simulated Thermometer)

Readout ID
Number

SC-M1554

Calibrated by:	Initials	ESJ
	Date	10-28-20
Reviewed by	Initials	JTM
	Date	10/28/20

Reference Thermometer	ID Number	TM-1901
	Calibration Exp Date	11-5-20
Reference Thermocouple	ID Number	S/N: WNW0107/30
	Calibration Exp Date	2-10-22
Thermometer Simulator	ID Number	TS-M1101
	Calibration Exp Date	3-31-21

Temperature Readout Calibration	
Reference Thermometer (°F)	68.7
Temperature Readout (°F)	68.8
Was Readout adjusted?	Y/N
Do these agree within 2°F	Y/N

Temperature Readout Linearity Check

Channel	Temperature (°F)		
	Theoretical	Observed	Difference ¹
1	-10	-9	1
	0	0	0
	50	48	2
	100	97	3
	175	173	2
	250	250	0
	350	350	0
	500	499	1
	750	750	0
	1000	1002	2
	1500	1501	1
	1900	1902	2

Channel	Temperature (°F)		
	Theoretical	Observed	Difference ¹
2	40	37	3
	250	249	1
3	40	37	3
	250	249	1
4	40	41	1
	100	100	0
5	40	39	1
	100	98	2
6	40	37	3
	100	96	4
7	40	37	3
	100	97	3

¹ Difference is calculated as follows:

Difference = Observed - Theoretical

Acceptable difference is $\pm 5^\circ\text{F}$ for temperatures below 1000°F and $\pm 10^\circ\text{F}$ for temperatures above 1000°F

Are these met?

Y/N

S-Type Pitot Tube Inspection

Probe ID
AL-1

Calibrated by	Initials EST
	Date 10-28-20
Reviewed by	Initials CT
	Date 11/17/2020

Caliper	ID CAL-M1505
	Calibration Exp Date 3-19-21

Angle Finder	ID D.Y. Pas
	Calibration Exp Date N/A

General Pitot Tube Alignment			$A = .86"$ $D_t = .29"$ $0.188 \leq D_t \leq 0.375$? Y (y/n) $1.05 \leq \frac{A}{2D_t} \leq 1.50$? Y (y/n)
			$\alpha_1 = .5^\circ$ $\alpha_2 = 1.4^\circ$ $\alpha_1 \leq 10^\circ$? Y (y/n) $\alpha_2 \leq 10^\circ$? Y (y/n)
			$\beta_1 = 1$ $\beta_2 = 1.5$ $\beta_1 \leq 5^\circ$? Y (y/n) $\beta_2 \leq 5^\circ$? Y (y/n)
			$\gamma = .15^\circ$ $\theta = .13^\circ$ $Z = A \tan(\gamma) = .0075$ $W = A \tan(\theta) = .0045$ $Z \leq 0.125$? Y (y/n) $W \leq 0.031$? Y (y/n)
Acceptability for Use (Circle Selection)	If all answers are "Y", this pitot tube is available for use, and may be assigned a correction factor of 0.84 If all answers except the first (D _t) are "Y", this pitot tube is available for use, but needs to be calibrated using a wind tunnel. Any other situation, the pitot tube must be removed from service.		

Stack Thermocouple Calibration

Thermometer (or Readout/TC)	ID TM-1901
	Calibration Exp Date 11-5-20
Temperature Readout	ID TS-M1101
	Calibration Exp Date 3-31-21

Calibrated by	Initials EST
	Date 10-28-20
Reviewed by	Initials CT
	Date 11/17/2020

Reference Thermometer $T_F = 65.8^\circ F$ $T_{abs, RT} = 525.9^\circ R$	Thermocouple Readout $T_F = 66.8^\circ F$ $T_{abs, TC} = 526.9^\circ R$	Compare Readings $\frac{T_{abs, TC}}{T_{abs, RT}} = 1.002$ Between 0.985 and 1.015? Y/N	Function Check 3°F change in readout upon external temperature stimulus? Y/N
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¹ $T_{abs} (^{\circ}R) = T_F (^{\circ}F) + 460$

S-Type Pitot Tube Inspection

Probe ID RTP 5-7
IP-M0507

Calibrated by	Initials <u>EJ</u>
	Date <u>10-30-20</u>
Reviewed by	Initials <u>AW</u>
	Date <u>12/15/2020</u>

Caliper	ID <u>CAL-M1505</u>
	Calibration Exp Date <u>3-19-21</u>

Angle Finder	ID <u>Digi-Pas</u>
	Calibration Exp Date <u>N/A</u>

General Pitot Tube Alignment	<div style="display: flex; justify-content: space-around;"> <div> <p>End View</p> </div> <div> <p>Side View</p> </div> </div> <div style="text-align: right;"> <p>$A = \frac{1}{35}$"</p> <p>$D_1 = \frac{1}{35}$"</p> <p>$0.188 \leq D_1 \leq 0.375$? <u>Y</u> (y/n)</p> <p>$1.05 \leq \frac{A}{2D_1} \leq 1.50$? <u>Y</u> (y/n)</p> </div>
Misalignment	<div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> </div> <div style="text-align: right;"> <p>$\alpha_1 = 0.2^\circ$</p> <p>$\alpha_2 = 1.7^\circ$</p> <p>$\alpha_1 \leq 10^\circ$? <u>Y</u> (y/n)</p> <p>$\alpha_2 \leq 10^\circ$? <u>Y</u> (y/n)</p> </div>
	<div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> </div> <div style="text-align: right;"> <p>$\beta_1 = 1.3$</p> <p>$\beta_2 = 1.1$</p> <p>$\beta_1 \leq 5^\circ$? <u>Y</u> (y/n)</p> <p>$\beta_2 \leq 5^\circ$? <u>Y</u> (y/n)</p> </div>
	<div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> </div> <div style="text-align: right;"> <p>$\gamma = 1^\circ$</p> <p>$\theta = 1.3^\circ$</p> <p>$Z = A \tan(\gamma) = 0.0017$</p> <p>$W = A \tan(\theta) = 0.0052$</p> <p>$Z \leq 0.125$? <u>Y</u> (y/n)</p> <p>$W \leq 0.031$? <u>Y</u> (y/n)</p> </div>
Acceptability for Use (Circle Selection)	<div style="display: flex; justify-content: space-between;"> <div>If all answers are "Y", this pitot tube is available for use, and may be assigned a correction factor of 0.84</div> <div>If all answers except the first (D₁) are "Y", this pitot tube is available for use, but needs to be calibrated using a wind tunnel.</div> <div>Any other situation, the pitot tube must be removed from service.</div> </div>

Stack Thermocouple Calibration

Thermometer (or Readout/TC)	ID <u>TM-1901</u>
	Calibration Exp Date <u>11-5-20</u>
Temperature Readout	ID <u>TS-M1101</u>
	Calibration Exp Date <u>3-31-21</u>

Calibrated by	Initials <u>EJ</u>
	Date <u>10-30-20</u>
Reviewed by	Initials
	Date

Reference Thermometer	Thermocouple Readout	Compare Readings	Function Check
T_F <u>68.9</u> °F $T_{abs, RT}$ <u>529.9</u> °R ¹	T_F <u>70.6</u> °F $T_{abs, TC}$ <u>530.6</u> °R	$\frac{T_{abs, TC}}{T_{abs, RT}} = 1.003$ Between 0.985 and 1.015? <u>Y/N</u>	3°F change in readout upon external temperature stimulus? <u>Y/N</u>

¹ $T_{abs, (°R)} = T_F (°F) + 460$

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