Wheelabrator South Broward Inc.
A Waste Management Company
4400 South State Road 7
Ft. Lauderdale, FL 33314

May 8, 2013

UPS# 1Z2AW7390197438931

Mr. Joe Lurix
Air Program Administrator
Florida Department of Environmental Protection
Southeast District
400 North Congress Ave., Suite 200
West Palm Beach, FL 33401

Re: Wheelabrator South Broward
2013 Annual Compliance Stack Test and RATA Reports

Dear Mr. Lurix:

Please find enclosed a copy of the final compliance stack test report and the continuous emissions monitoring system certification RATA report for testing conducted on March 25-27 of this year by Clean Air Engineering, Inc.

I, the undersigned, am a responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this submittal. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements and information in this document are true, accurate and complete.

If there are any questions, please contact this office at (954) 581-6606.

Sincerely,

Scott McIlvaine
Plant Manager

cc: USEPA, Region IV, Pesticides and Toxics Management Division, Air & EPCRA Enforcement Branch, Air Enforcement Section (with) UPS#1Z2AW7390196354363

FDEP, Tallahassee, Bureau of Air Regulation, New Source Review Section, (with) UPS#1Z2AW7390196615143

Broward County Department of Planning and Environmental Protection, Air Quality Division (with) UPS#1Z2AW7390195194958

Nicole Turnbull (with)
Ram Tewari – BCWRS (without)
Tim Porter (without)
Rob French – MPI (with)

CleanAir.

CleanAir Engineering
500 W. Wood Street
Palatine, IL 60067-4975
www.cleanair.com

Wheelabrator South Broward, Inc.
4400 South State Road 7
Ft. Lauderdale, FL 33314

REPORT ON COMPLIANCE TESTING

Performed for:

WHEELABRATOR SOUTH BROWARD, INC.
ASH HANDLING SYSTEM, LIME SILO VENT,
UNITS 1, 2 AND 3 SDA INLETS, FF OUTLETS AND STACKS
FT. LAUDERDALE, FL
VOLUME II OF III

Client Reference No: Service Agreement
CleanAir Project No: 12218-3
Revision 0: May 8, 2013

TEST METHOD SPECIFICATIONS

B

I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: NK

Date: 5/16/13

CleanAir.

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Specification Sheet for EPA Method 5/29

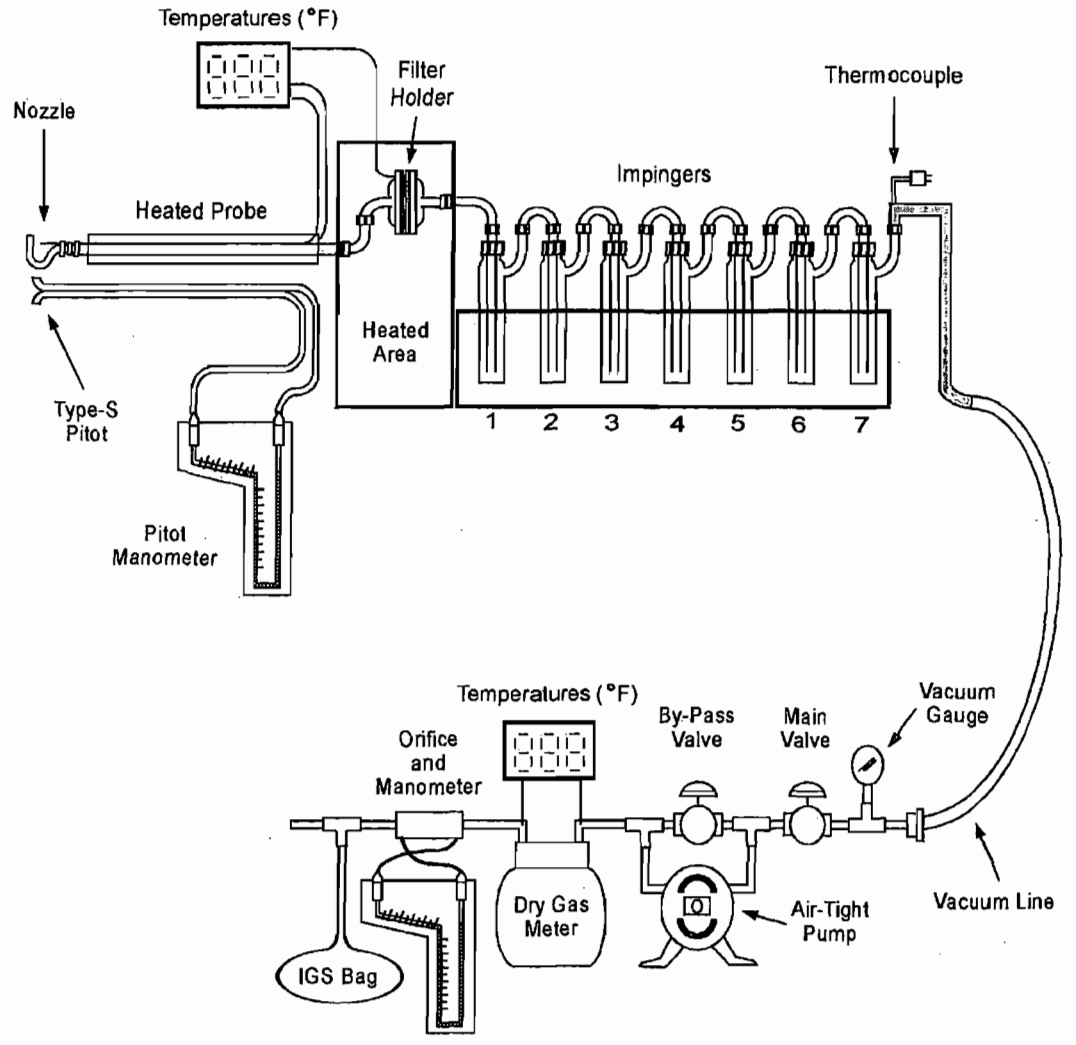
Source Location Name(s)	Units 1, 2 and 3 FF Outlets
Pollutant(s) to be Determined	Particulate Matter (PM) and Trace Metals (including Mercury)
Other Parameters to be Determined from Train	Gas Density, Moisture, Flow Rate

	Standard Method Specification	Actual Specification Used
Pollutant Sampling Information		
Duration of Run	N/A	125 minutes
No. of Sample Traverse Points	N/A	25
Sample Time per Point	N/A	5 minutes
Sampling Rate	Isokinetic (90-110%)	Isokinetic (90-110%)
Sampling Probe		
Nozzle Material	Borosilicate or Quartz Glass	Borosilicate Glass
Nozzle Design	Button-Hook or Elbow	Button-Hook
Probe Liner Material	Borosilicate or Quartz Glass	Borosilicate Glass
Effective Probe Length	N/A	8 feet
Probe Temperature Set-Point	248°F±25°F	248°F±25°F
Velocity Measuring Equipment		
Pitot Tube Design	Type S	Type S
Pitot Tube Coefficient	N/A	varied
Pitot Tube Calibration by	Geometric or Wind Tunnel	Wind-Tunnel
Pitot Tube Attachment	Attached to Probe	Attached to Probe
Metering System Console		
Meter Type	Dry Gas Meter	Dry Gas Meter
Meter Accuracy	±2%	±1%
Meter Resolution	N/A	0.01 cubic feet
Meter Size	N/A	0.1 dcf/revolution
Meter Calibrated Against	Wet Test Meter or Standard DGM	Wet Test Meter
Pump Type	N/A	Rotary Vane
Temperature Measurements	N/A	Type K Thermocouple/Pyrometer
Temperature Resolution	5.4°F	1.0°F
ΔP Differential Pressure Gauge	Inclined Manometer or Equivalent	Inclined Manometer
ΔH Differential Pressure Gauge	Inclined Manometer or Equivalent	Inclined Manometer
Barometer	Mercury or Aneroid	Digital Barometer calibrated w/Mercury Aneroid
Filter Description		
Filter Location	After Probe	Exit of Probe
Filter Holder Material	Borosilicate Glass	Borosilicate Glass
Filter Support Material	Teflon (or other non-metallic material)	Teflon
Cyclone Material	N/A	None
Filter Heater Set-Point	248°F±25°F	248°F±25°F
Filter Material	Quartz or Fiberglass Fiber	Quartz Fiber
Other Components		
Description	N/A	N/A
Location	N/A	N/A
Operating Temperature	N/A	N/A

Specification Sheet for EPA Method 5/29

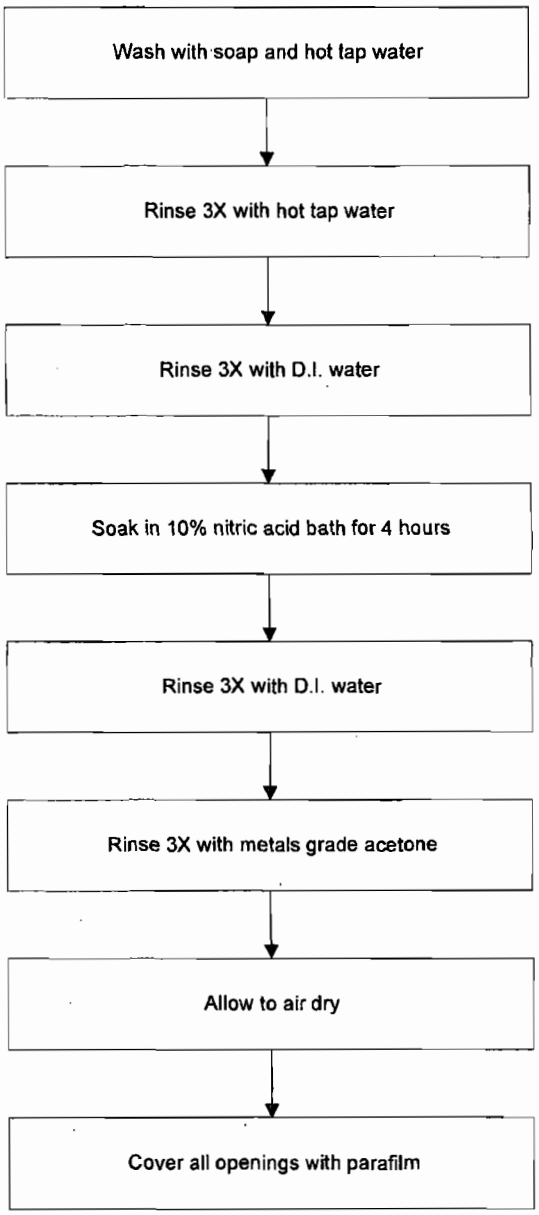
	Standard Method Specification	Actual Specification Used
Impinger Train Description		
Type of Glassware Connections	Ground Glass or Equivalent	Screw Joint with Silicone Gasket
Connection to Probe or Filter by	Direct Glass Connection	Direct Glass Connection
Number of Impingers	7	7
Impinger Stem Types		
Impinger 1	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 2	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 3	Greenburg-Smith	Greenburg-Smith
Impinger 4	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 5	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 6	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 7	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 8		
Gas Density Determination		
Sample Collection	Multi-point integrated	Multi-Point Integrated
Sample Collection Medium	Flexible Gas Bag	Vinyl Bag
Sample Analysis	Orsat or Fyrite Analyzer	CEM
Sample Recovery Information		
Probe Brush Material	Non-metallic swab or bristle	Teflon Mat
Probe Rinse Reagent	Acetone/0.1N Nitric Acid	Acetone/0.1N. Nitric Acid
Probe Rinse Wash Bottle Material	Glass or Teflon	Teflon
Probe Rinse Storage Container	See Method 29 Recovery Flow Chart	See Recovery Flow Chart
Filter Recovered?	Yes	Yes
Filter Storage Container	Petri Dish - Glass or Polystyrene	Glass
Impinger Contents Recovered?	Yes	Yes
Impinger Rinse Reagent	See Method 29 Recovery Flow Chart	See Recovery Flow Chart
Impinger Wash Bottle	Glass or Teflon	Teflon
Impinger Storage Container	See Recovery Flow Chart	See Recovery Flow Chart
Analytical Information		
Method 4 H_2O Determination by	Volumetric or Gravimetric	Gravimetric and Volumetric
Filter Preparation Conditions	See Method 29 Analytical Flow Chart	For Metals Analysis
Front-Half Rinse Preparation	See Method 29 Analytical Flow Chart	See Analytical Flow Chart
Back-Half Analysis	See Method 29 Analytical Flow Chart	See Analytical Flow Chart
Additional Analysis	Gravimetric (EPA Method 5)	Gravimetric (EPA Method 5)

EPA Method 5/29 and 29
Sampling Train Configuration



	Impinger Contents
Impinger 1	Empty
Impinger 2	100 ml 5% HNO_3 / 10% H_2O_2
Impinger 3	100 ml 5% HNO_3 / 10% H_2O_2
Impinger 4	Empty
Impinger 5	100 ml 4% $KMnO_4$ / 10% H_2SO_4
Impinger 6	100 ml 4% $KMnO_4$ / 10% H_2SO_4
Impinger 7	Silica Gel

EPA Method 29
Glassware Preparation Procedures



EPA Method 29
Sample Recovery Flowchart
(includes Mercury and Particulate Matter)

- Tare all sample containers before sample collection
- Mark all liquid levels and final weights on the outside of each sample container
- Seal all sample containers with Teflon tape
- If recycling, bake silica gel for two hours at 350 degrees F (175 degrees C)
- Collect one complete blank set per field test

Container 1
Tared Quartz Filter
Petri Dish

Remove with acid washed polypropylene or Teflon tweezers to plastic container.

Remove any particulate or filter fiber to sample container

If necessary, fold the filter and transfer to the container.

Container 2
Acetone Rinse
250 ml Glass

Probe liner, nozzle, cyclone bypass and front half (FH) filter housing

Brush/rinse 3X with a total of 100 ml acetone

Visual Inspection

Label container and measure volume by weight

Container 3
Probe Rinse
250 ml HDPE

Probe liner, nozzle, cyclone bypass and front half (FH) filter housing

Rinse 3X with a total of 100 ml 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 7
Acetone Blank
250 ml Glass

100 ml of acetone

Container 8A
0.1 N HNO3
1000 ml HDPE

300 ml of 0.1N HNO3

Container 8B
D.I. Water Blank
250 ml HDPE

100 ml of water

Container 4
1000 ml HDPE

Back half (BH) filter housing, Z-piece, impingers 1, 2, 3 and U-bends

Measure impinger volume by weight

Transfer to sample container

Rinse each piece 3X with a total of 100 ml 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 9
5% HNO3 / 10% H2O2
250 ml HDPE

200 ml of absorbing solution

Container 5A
250 ml HDPE

Impinger 4 and U-bend

Measure impinger volume by weight

Transfer to sample container

Rinse with 100 ml of 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 10
4% KMnO4 / 10% H2SO4
250 ml Amber Glass

100 ml KMnO4 solution

Container 5B
950 ml Amber Glass

Impingers 5, 6 and U-bends

Measure impinger volume by weight

Transfer to sample container

Rinse each piece 3X with 100 ml of acidic permanganate solution

Rinse 3X with 100 ml of water

Visual Inspection

Label container and measure volume by weight

Container 5C
250 ml Amber Glass

If brown spots remain in impingers, remove residue with 25 ml of 8N HCl total for both impingers

Pour HCl rinse into bottle containing 200 ml of water

Label container and measure volume by weight

Container 6
Silica Gel

Measure and record impinger, volume by weight, record condition of indicating gel

Recycle silica gel

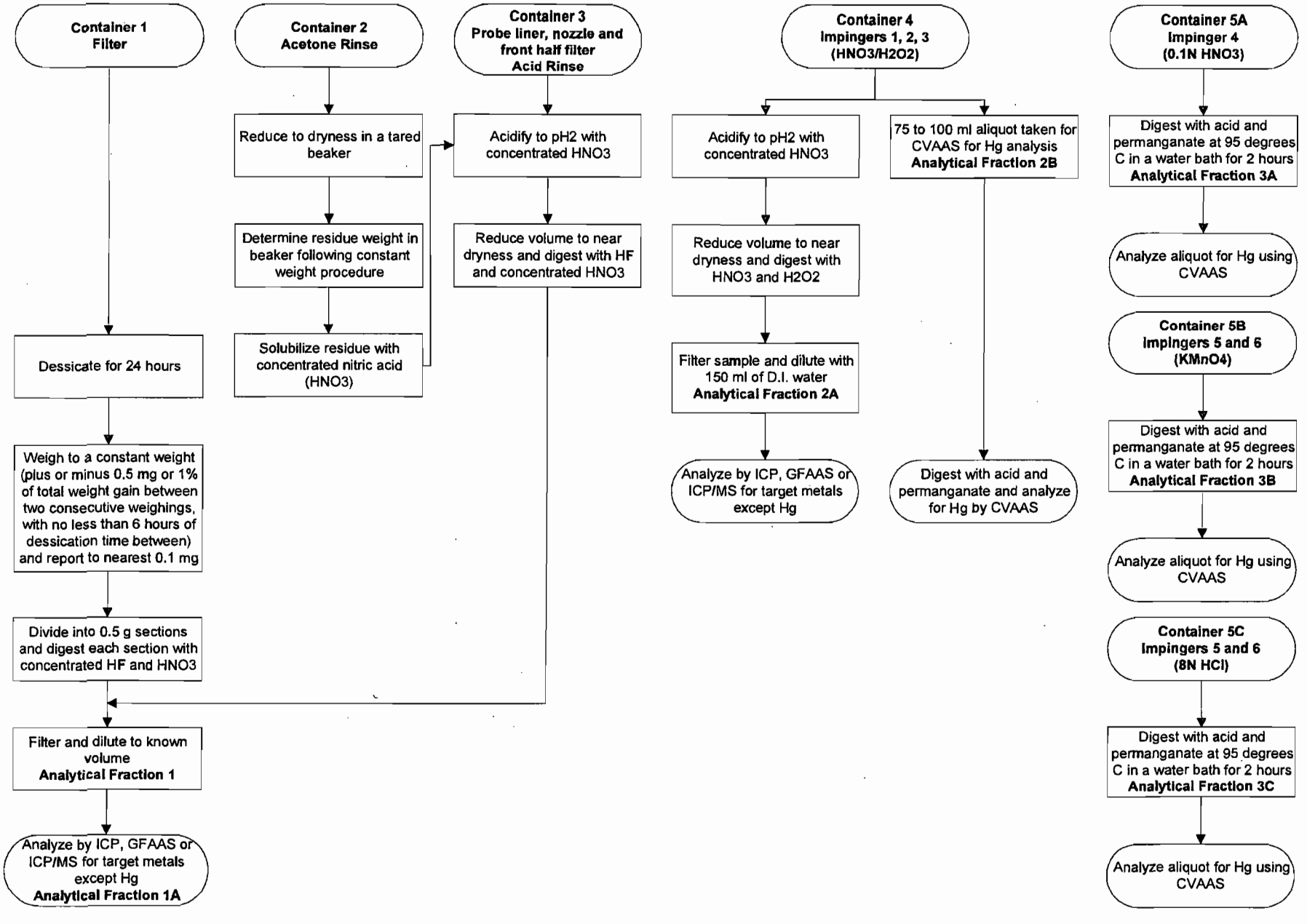
Container 11
HCl Rinse Blank
250 ml Amber Glass

200 ml water, add 25 ml of 8N HCl. Mix well and seal

Container 12
Filter Blanks
250 ml HDPE

3 clean, unused filters

EPA Method 29
Analytical Flowchart
(includes Mercury and Particulate Matter)



EPA Method 29
Sample Recovery Flowchart
(including mercury)

- Tare all sample containers before sample collection
- Mark all liquid levels and final weights on the outside of each sample container
- Seal all sample containers with Teflon tape
- If recycling, bake silica gel for two hours at 350 degrees F (175 degrees C)
- Collect one complete blank set per field test

Container 1
Quartz Filter
250 ml HDPE

Remove with acid washed polypropylene or Teflon tweezers to plastic container.

Remove any particulate or filter fiber to sample container

If necessary, fold the filter and transfer to the container.

Container 8A
0.1 N HNO3
1000 ml HDPE

300 ml of 0.1N HNO3

Container 9
5% HNO3 / 10% H2O2
Blank
250 ml HDPE

200 ml of absorbing solution

Container 3
Probe Rinse
250 ml HDPE

Probe liner, nozzle, cyclone bypass and front half (FH) filter housing

Brush/rinse 3X with a total of 100 ml 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 8B
D.I. Water Blank
250 ml HDPE

100 ml of water

Container 10
4% KMnO4 / 10% H2SO4
Blank
250 ml Amber Glass

100 ml KMnO4 solution

Container 4
1000 ml HDPE

Back half (BH) filter housing, Z-piece, impingers 1, 2, 3 and U-bends

Measure impinger volume by weight

Transfer to sample container

Rinse each piece 3X with a total of 100 ml 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 11
HCl Rinse Blank
250 ml Amber Glass

200 ml water, add 25 ml of 8N HCl. Mix well and seal

Container 5A
250 ml HDPE

Impinger 4 and U-bend

Measure impinger volume by weight to within 0.5 ml

Transfer to sample container

Rinse with 100 ml of 0.1N HNO3

Visual Inspection

Label container and measure volume by weight

Container 12
Filter Blanks
250 ml HDPE or Petri Dish

3 clean, unused filters

Container 5B
950 ml Amber Glass

Impingers 5, 6 and U-bends

Measure impinger volume by weight

Transfer to sample container

Rinse each piece 3X with 100 ml of acidic permanganate solution

Rinse 3X with 100 ml of water

Visual Inspection

Label container and measure volume by weight

Container 6
Silica Gel

Measure and record impinger, volume by weight, record condition of indicating gel

Recycle silica gel

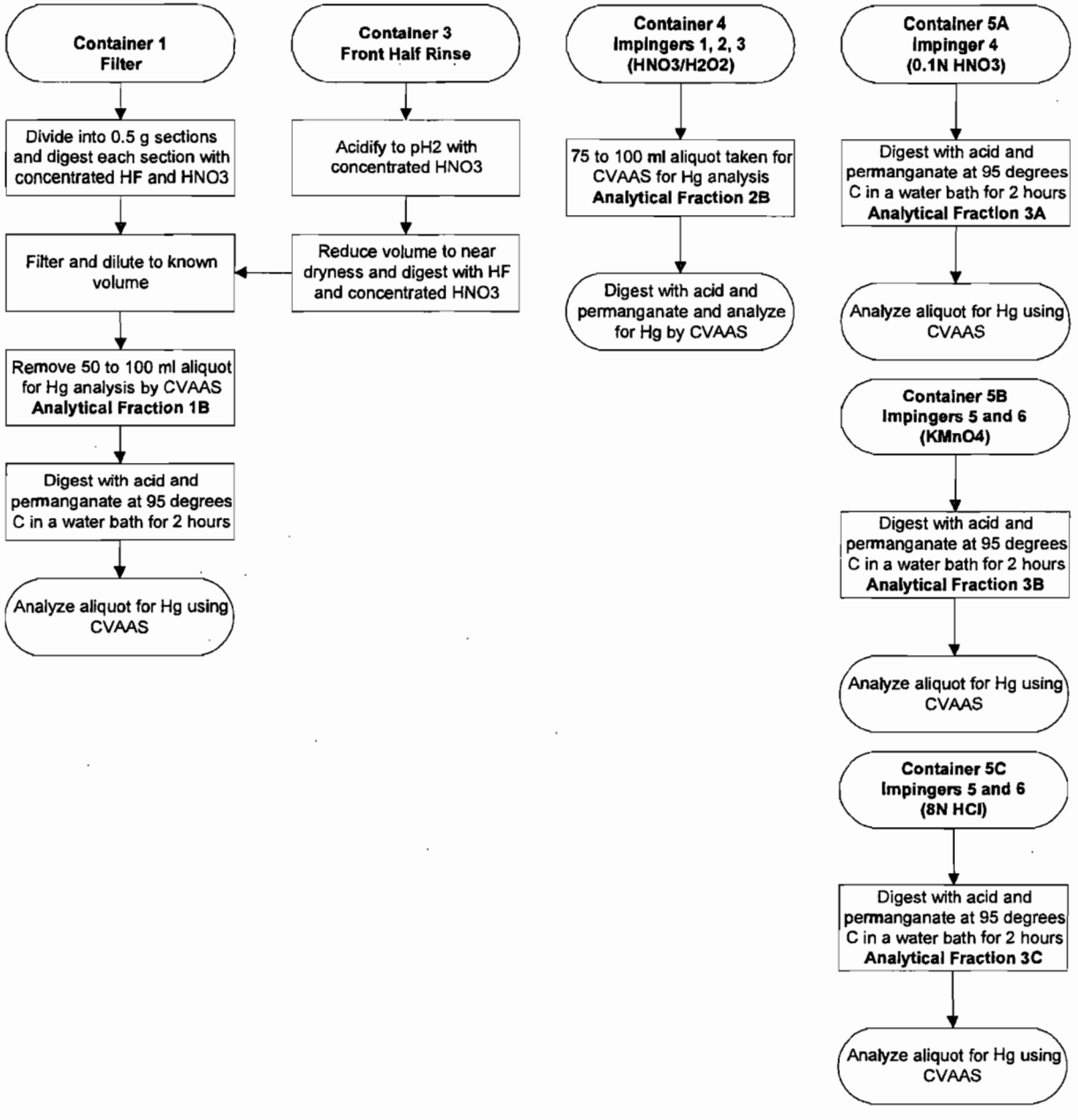
Container 5C
250 ml Amber Glass

If brown spots remain in impingers, remove residue with 25 ml of 8N HCl total for both impingers

Pour HCl rinse into bottle containing 200 ml of water

Label container and measure volume by weight

EPA Method 29
Analytical Flowchart
(Mercury only)



Specification Sheet for EPA Method 23

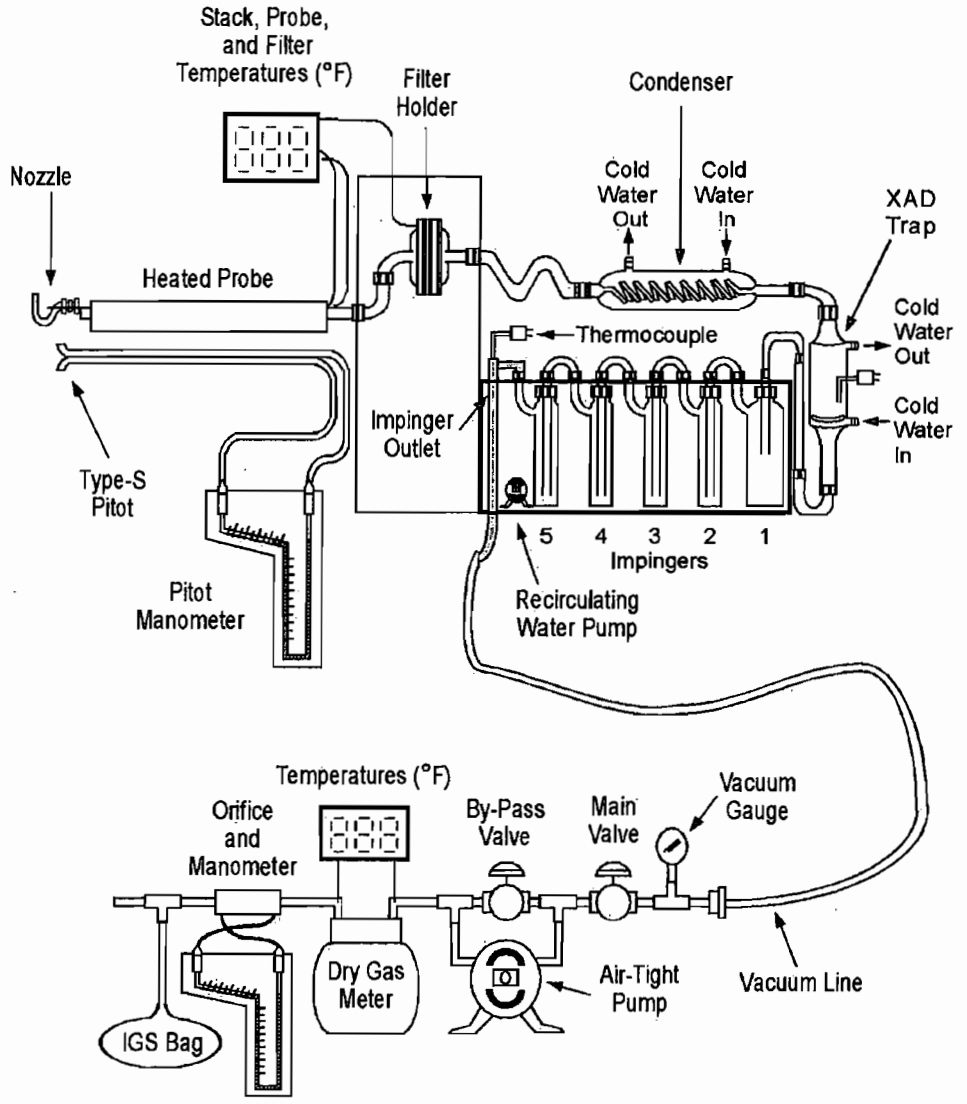
Source Location Name(s)	Unit 2 FF Outlet
Pollutant(s) to be Determined	Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans (PCDD/PCDF)
Other Parameters to be Determined from Train	Gas Density, Moisture, Flow Rate

	Standard Method Specification	Actual Specification Used
Pollutant Sampling Information		
Duration of Run	N/A	250 minutes
No. of Sample Traverse Points	N/A	25
Sample Time per Point	N/A	10 minutes
Sampling Rate	Isokinetic (90-110%)	Isokinetic (90-110%)
Sampling Probe		
Nozzle Material	Nickel, Quartz, Stainless Steel or Glass	Borosilicate Glass
Nozzle Design	Button-Hook or Elbow	Button-Hook
Probe Liner Material	Borosilicate or Quartz Glass	Borosilicate Glass
Effective Probe Length	N/A	8 feet
Probe Temperature Set-Point	248°F±25°F	248°F±25°F
Velocity Measuring Equipment		
Pitot Tube Design	Type S	Type S
Pitot Tube Coefficient	N/A	0.813
Pitot Tube Calibration by	Geometric or Wind Tunnel	Wind-Tunnel
Pitot Tube Attachment	Attached to Probe	Attached to Probe
Metering System Console		
Meter Type	Dry Gas Meter	Dry Gas Meter
Meter Accuracy	±2%	±1%
Meter Resolution	N/A	0.01 cubic feet
Meter Size	N/A	0.1 dcf/revolution
Meter Calibrated Against	Wet Test Meter or Standard DGM	Wet Test Meter
Pump Type	N/A	Rotary Vane
Temperature Measurements	N/A	Type K Thermocouple/Pyrometer
Temperature Resolution	5.4°F	1.0°F
ΔP Differential Pressure Gauge	Inclined Manometer or Equivalent	Inclined Manometer
ΔH Differential Pressure Gauge	Inclined Manometer or Equivalent	Inclined Manometer
Barometer	Mercury or Aneroid	Digital Barometer calibrated w/Mercury Aneroid
Filter Description		
Filter Location	After Probe	Exit of Probe
Filter Holder Material	Borosilicate Glass	Borosilicate Glass
Filter Support Material	Glass Frit	Teflon
Cyclone Material	N/A	None
Filter Heater Set-Point	248°F±25°F	248°F±25°F
Filter Material	Glass Fiber - Toluene Extracted	Glass Fiber - Toluene Extracted
Other Components		
Adsorbent Module	XAD-2 Trap	XAD-II Adsorbent Trap
Location	After filter and condenser	After filter and condenser
Operating Temperature	< 68°F	<68°F

Specification Sheet for EPA Method 23

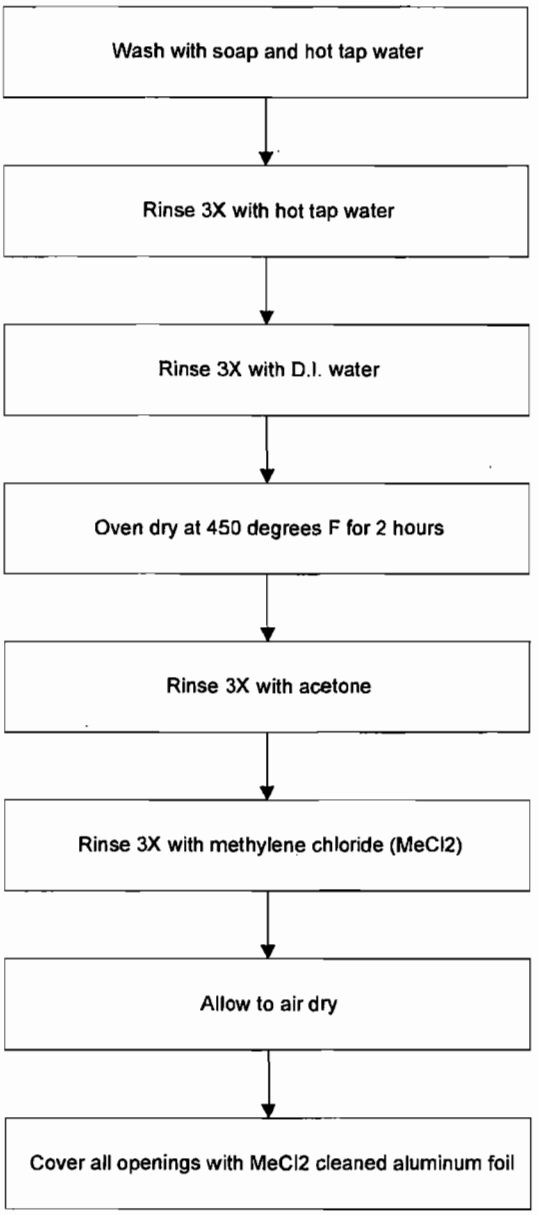
	Standard Method Specification	Actual Specification Used
Impinger Train Description		
Type of Glassware Connections	Ground Glass or Equivalent	Screw Joint with Silicone Gasket
Connection to Probe or Filter by	Direct Glass Connection	Direct Glass Connection
Number of Impingers	5	5
Impinger Stem Types		
Impinger 1	Modified Greenburg-Smith	Shortened Stem (open tip)
Impinger 2	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 3	Greenburg-Smith	Greenburg-Smith
Impinger 4	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 5	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 6		
Impinger 7		
Impinger 8		
Gas Density Determination		
Sample Collection	Multi-point integrated	Multi-Point Integrated
Sample Collection Medium	Flexible Gas Bag	Vinyl Bag
Sample Analysis	Orsat or Fyrite Analyzer	CEM
Sample Recovery Information		
Probe Brush Material	Inert Bristle	Teflon Mat
Probe Rinse Reagent	Acetone/Methylene Chloride/Toluene	Acetone/Toluene (see Appendix J)
Probe Rinse Wash Bottle Material	Glass or Teflon	Teflon
Probe Rinse Storage Container	Glass	Glass
Filter Recovered?	Yes	Yes
Filter Storage Container	Petri Dish - Glass or Polystyrene	Glass
Impinger Contents Recovered?	No	Archived
Impinger Rinse Reagent	N/A	HPLC Water
Impinger Wash Bottle	N/A	Teflon
Impinger Storage Container	N/A	Polyethylene
Analytical Information		
Method 4 H_2O Determination by	Volumetric or Gravimetric	Gravimetric
Filter Preparation Conditions	See Method 23 Analytical Flow Chart	For Organic Analysis
Front-Half Rinse Preparation	See Method 23 Analytical Flow Chart	Organic Analysis
Back-Half Analysis	N/A	Archive
Additional Analysis	None	None

EPA Method 23
Sampling Train Configuration

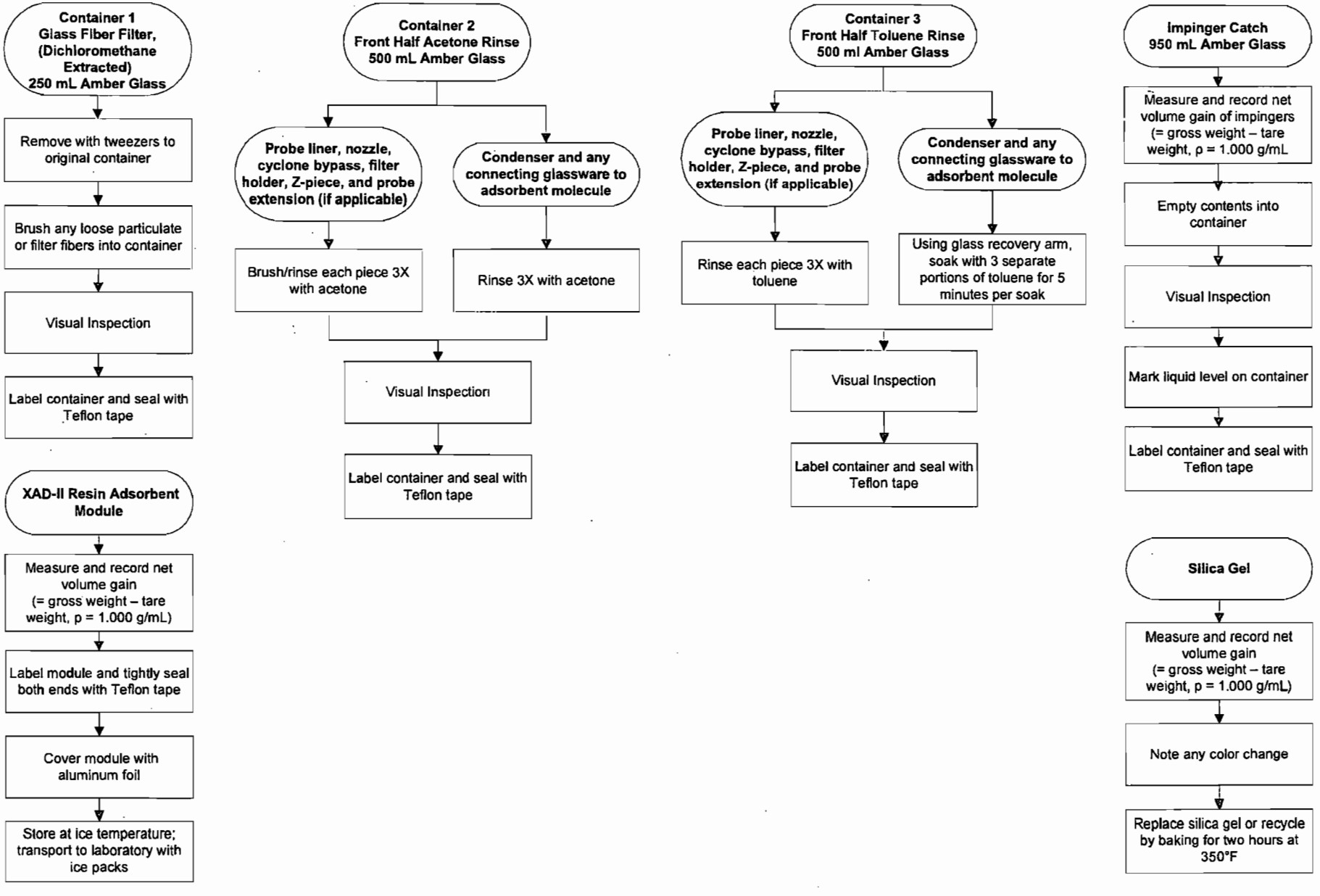


Impinger Contents	
Impinger 1	Empty
Impinger 2	100 ml HPLC H_2O
Impinger 3	100 ml HPLC H_2O
Impinger 4	Empty
Impinger 5	Silica Gel

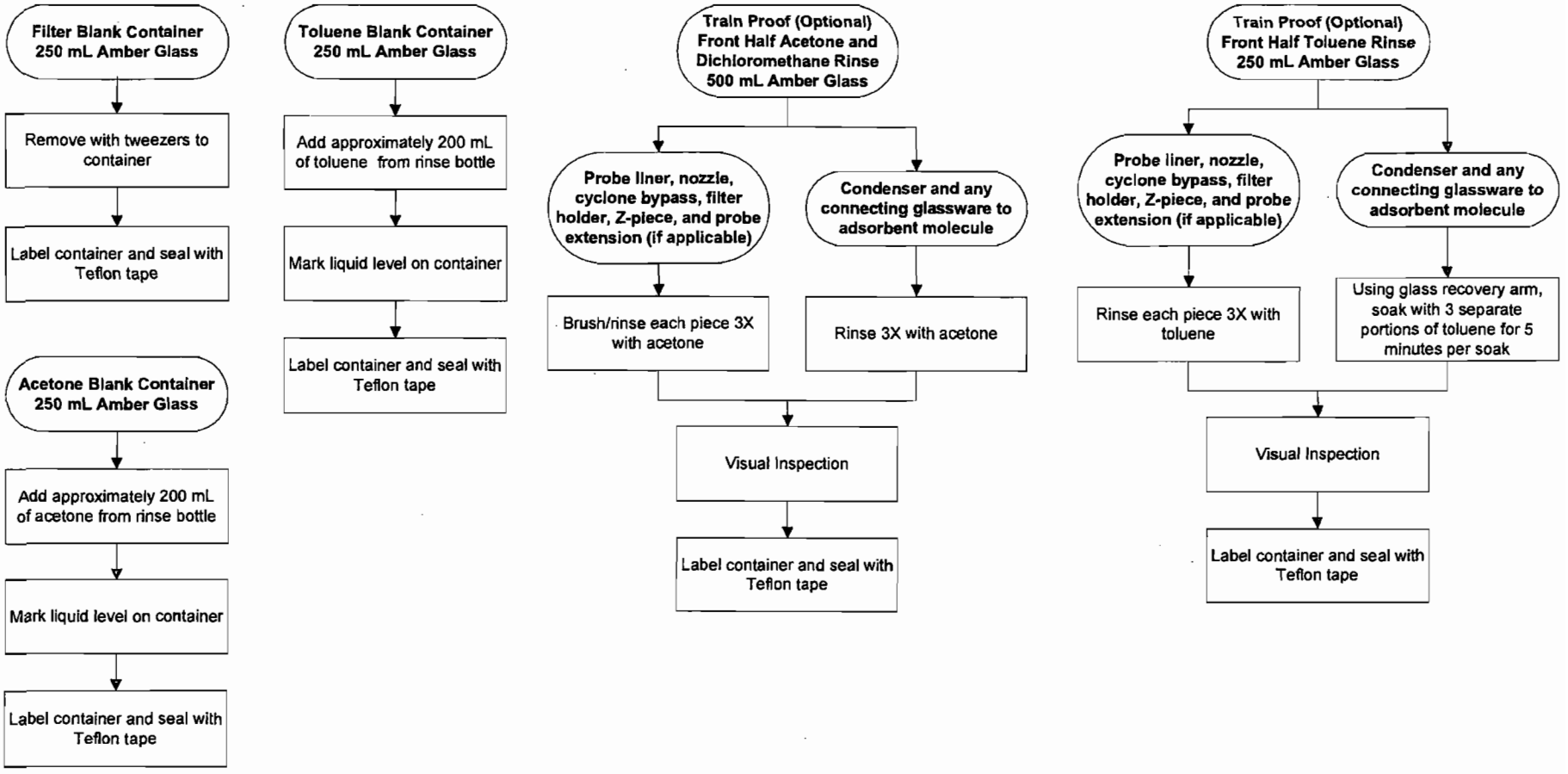
EPA Method 23
Glassware Preparation Procedures



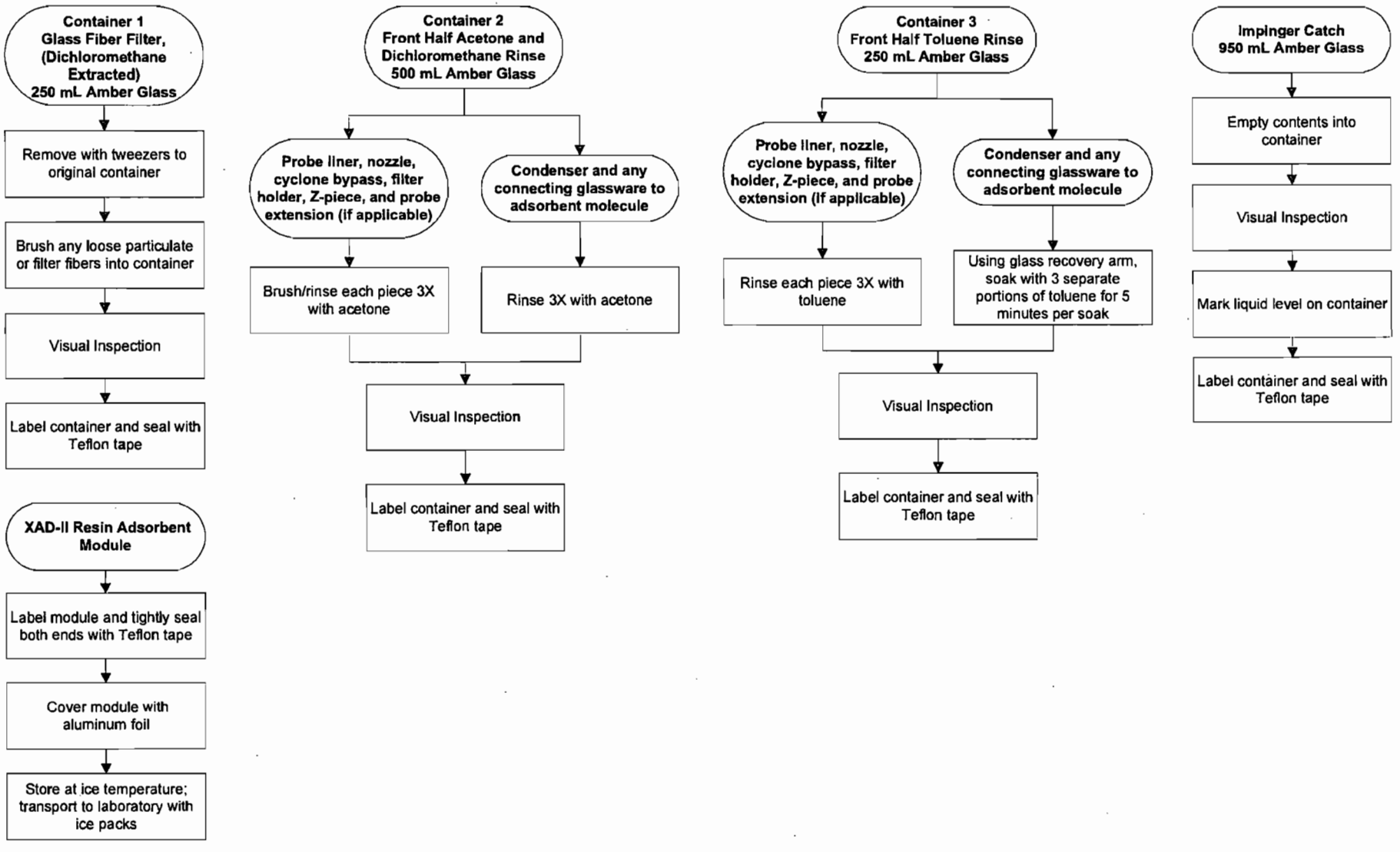
EPA Method 23
Sample Recovery Flowchart – Test Runs



EPA Method 23
Sample Recovery Flowchart – Blanks and Proofs



EPA Method 23
Sample Recovery Flowchart – Field Train Blank



EPA Method 23
Analytical Flowchart

- Log each sample in shipment and verify against chain-of-custody sheet
- Note liquid levels in the sample containers and confirm on the chain-of-custody sheet condition
- All samples must be extracted within 30 days of collection
- All samples must be analyzed within 45 days of extraction
- All laboratory glassware must be cleaned as described in Section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides"

Container 1
Glass fiber filter

Transfer to extraction thimble

XAD-II Resin Absorbent Module

Transfer to extraction thimble

Container 2
acetone/methylene chloride (MeCl2)

Concentrate sample to volume of 1 to 5 ml and add to extraction thimble

Container 3
Toluene

Add internal standard solution and concentrate to 1 - 5 ml

Dissolve sample in 5 ml of hexane and analyze by GC/MS

Add internal standard solution

Place thimble in extractor and extract for 16 hours

Concentrate to approximately 10 ml (split sample into two 5 ml portions for future use, optional)

Dissolve sample in 5 ml of hexane and analyze by gas chromatography coupled to a mass spectrometer (GC/MS)
DB-5 capillary column

If tetra-chlorinated dibenzofurans are detected, analyze separate aliquot using DB-225 capillary column

Containers 5, 6, 7, 8
Reagent blanks

Glass fiber filter
acetone
MeCl2
toluene
XAD-II Resin

Analysis by GC/MS, DB-5 capillary column

If tetra-chlorinated dibenzofurans are detected, analyze separate aliquot using DB-225 capillary column

Audit Sample

Audit samples must be analyzed subject to availability

Specification Sheet for EPA Method 26A (modified)

Note: Modification includes the use of full-size impingers instead of midget impingers.

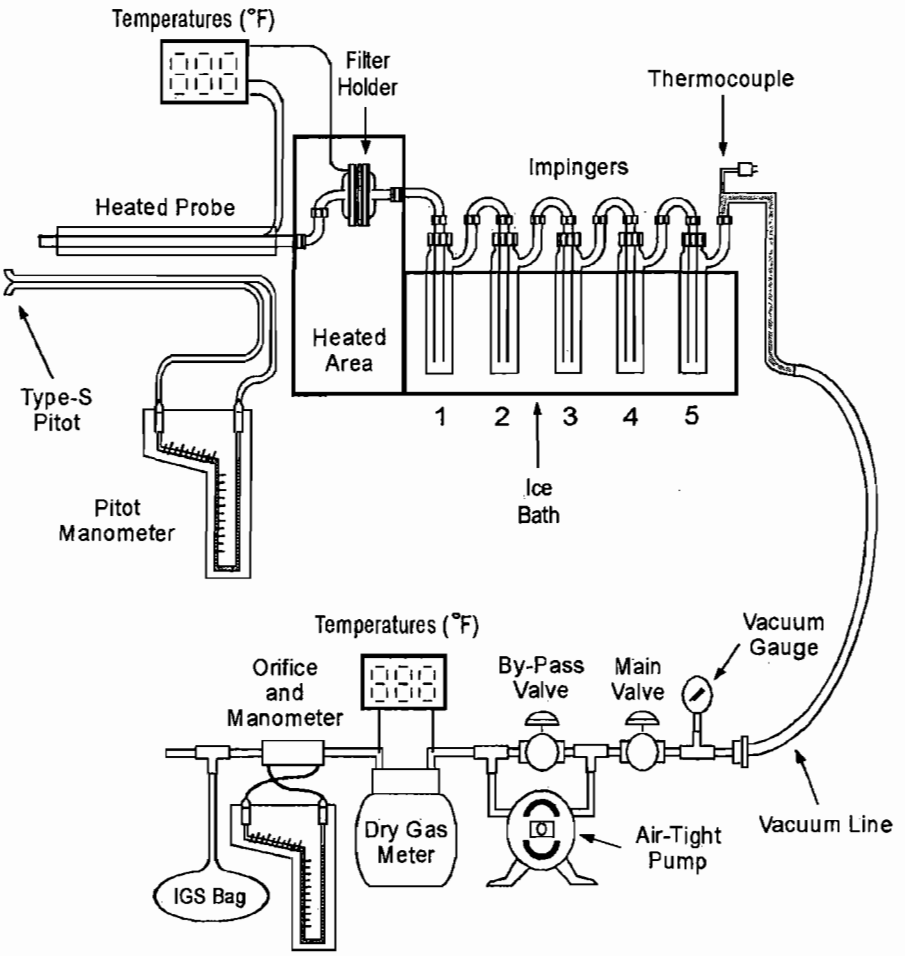
Source Location Name(s)	Units 1-3 SDA Inlets and Units 1-3 FF Outlets
Pollutant(s) to be Determined	Hydrogen Chloride (HCl)
Other Parameters to be Determined from Train	Gas Density, Moisture

	Standard Method Specification	Actual Specification Used
Pollutant Sampling Information		
Duration of Run	N/A	60 minutes
No. of Sample Traverse Points	N/A	1
Sample Time per Point	N/A	60 minutes
Sampling Rate	Constant Rate (±10%)	Constant Rate (±10%)
Sampling Probe		
Nozzle Material	N/A	None
Nozzle Design	N/A	N/A
Probe Liner Material	Borosilicate Glass	Borosilicate Glass
Effective Probe Length	N/A	4 feet
Probe Temperature Set-Point	>248°F	350°F @ Inlet, Stack Temp @ FF Outlet
Velocity Measuring Equipment		
Pitot Tube Design	None	None
Pitot Tube Coefficient	N/A	N/A
Pitot Tube Calibration by	N/A	N/A
Pitot Tube Attachment	N/A	N/A
Metering System Console		
Meter Type	Dry Gas Meter or Critical Orifice	Dry Gas Meter
Meter Accuracy	±2%	±1%
Meter Resolution	N/A	0.01 cubic feet
Meter Size	2 liters/minute	0.1 dcf/revolution
Meter Calibrated Against	Wet Test Meter	Wet Test Meter
Pump Type	Diaphragm or equivalent	Rotary Vane
Temperature Measurements	Dial Thermometer or equivalent	Type K Thermocouple/Pyrometer
Temperature Resolution	2°F-5.4°F	1.0°F
ΔP Differential Pressure Gauge	N/A	N/A
ΔH Differential Pressure Gauge	N/A	Inclined Manometer
Barometer	Mercury, aneroid or other.	Digital Barometer calibrated w/Mercury Aneroid
Filter Description		
Filter Location	After Probe	Exit of Probe
Filter Holder Material	Teflon or Quartz	Borosilicate Glass
Filter Support Material	Teflon Frit	Teflon
Cyclone Material	N/A	None
Filter Heater Set-Point	>248°F	350°F @ Inlet, Stack Temp @ FF Outlet
Filter Material	Teflon/Glass Mat (Quartz, Optional High Temp>410F)	Quartz Fiber @ Inlet, Teflon on Glass @ Outlet
Other Components		
Description	N/A	N/A
Location	N/A	N/A
Operating Temperature	N/A	N/A

Specification Sheet for EPA Method 26A (modified)

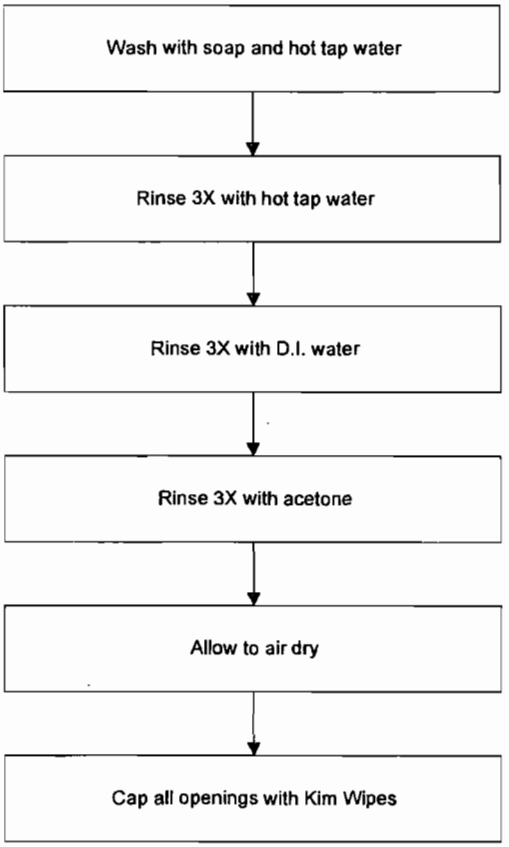
	Standard Method Specification	Actual Specification Used
Impinger Train Description		
Type of Glassware Connections	Ground Glass or Equivalent	Screw Joint with Silicone Gasket
Connection to Probe or Filter by	Direct Glass Connection	Direct Glass Connection
Number of Impingers	5 or 6 (Midget Impingers)	5
Impinger Stem Types		
Impinger 1	Shortened Stem	Shortened Stem (open tip)
Impinger 2	Greenburg-Smith	Greenburg-Smith
Impinger 3	Greenburg-Smith	Greenburg-Smith
Impinger 4	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 5	Modified Greenburg-Smith	Modified Greenburg-Smith
Impinger 6		
Impinger 7		
Impinger 8		
Gas Density Determination		
Sample Collection	N/A	Single Point Integrated
Sample Collection Medium	N/A	Vinyl Bag
Sample Analysis	N/A	CEM
Sample Recovery Information		
Probe Brush Material	N/A	N/A
Probe Rinse Reagent	N/A	N/A
Probe Rinse Wash Bottle Material	N/A	N/A
Probe Rinse Storage Container	N/A	N/A
Filter Recovered?	No	No
Filter Storage Container	N/A	N/A
Impinger Contents Recovered?	Yes	Yes
Impinger Rinse Reagent	Deionized Distilled Water	Deionized Distilled Water
Impinger Wash Bottle	Polyethylene or glass	Polyethylene
Impinger Storage Container	Polyethylene	Polyethylene
Analytical Information		
Method 4 H_2O Determination by	N/A	Gravimetric
Filter Preparation Conditions	N/A	N/A
Front-Half Rinse Preparation	N/A	N/A
Back-Half Analysis	Ion Chromatography	Ion Chromatography
Additional Analysis	None	None

Modified EPA Method 26A
Sampling Train Configuration

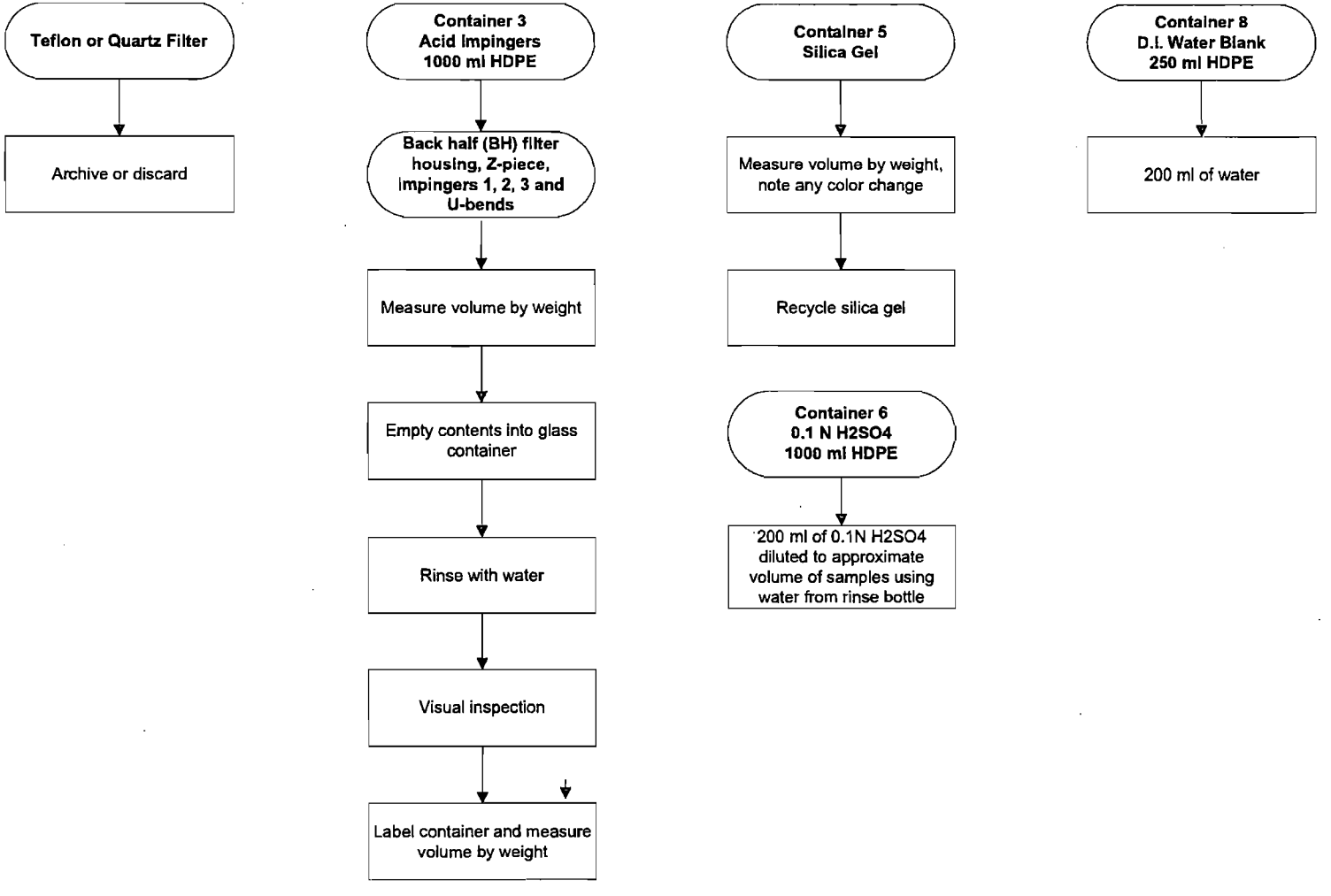


Impinger Contents	
Impinger 1	50 ml 0.1 N H_2SO_4
Impinger 2	100 ml 0.1 N H_2SO_4
Impinger 3	100 ml 0.1 N H_2SO_4
Impinger 4	Empty
Impinger 5	Silica Gel

EPA Method 26A
Glassware Preparation Procedures

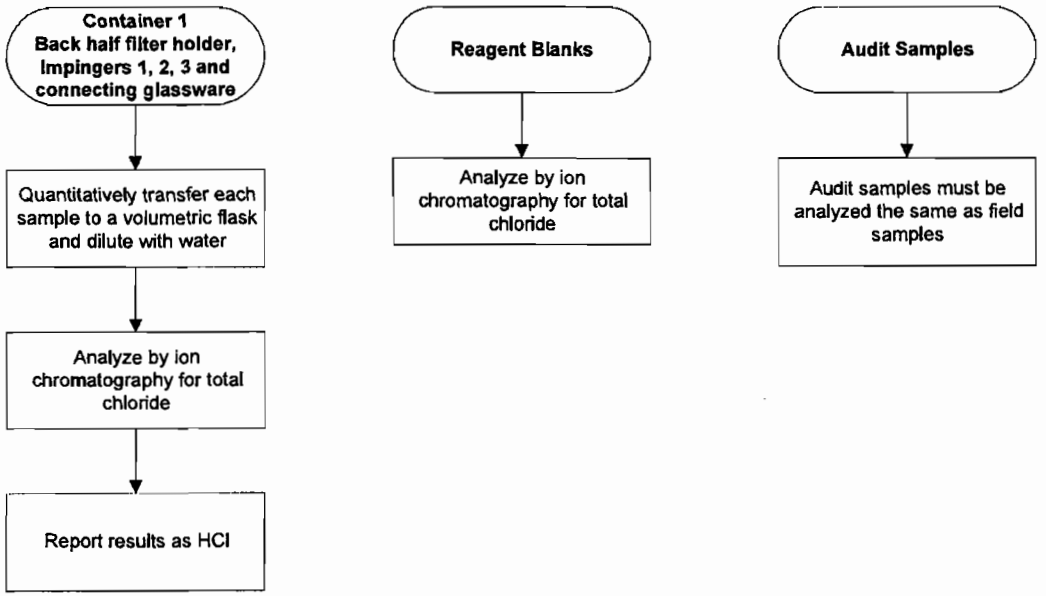


Modified EPA Method 26A
Sample Recovery Flowchart
(without Halogens)



EPA Method 26
Analytical Flowchart
(without Cl2)
(Modified)

- Log each sample in shipment and verify against chain-of-custody sheet
- Note liquid levels in the sample containers and confirm on the chain-of-custody sheet condition



SAMPLE CALCULATIONS

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I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

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CleanAir

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USEPA Method 5/29 (Particulate/Metals)
Sampling, Velocity and Moisture Sample Calculations

Sample data taken from Run 1

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results, and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

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1. Volume of water collected (wscf)

$$V_{wstd} = (0.04706)(V_{lc})$$

Where:

V_{lc}	= total volume of liquid collected in impingers and silica gel (ml)	=	436.7	ml
0.04706	= ideal gas conversion factor (ft^3 water vapor/ml or gm)	=	0.04706	ft^3/ml
V_{wstd}	= volume of water vapor collected at standard conditions (ft^3)	=	20.55	ft^3

2. Volume of gas metered, standard conditions (dscf)

$$V_{mstd} = \frac{(17.64)(V_m)\left(P_{bar} + \frac{\Delta H}{13.6}\right)(Y_d)}{(460 + T_m)}$$

Where:

P_{bar}	= barometric pressure (in. Hg)	=	29.70	in. Hg
T_m	= average dry gas meter temperature (°F)	=	81.86	°F
V_m	= volume of gas sample through the dry gas meter at meter conditions (dcf)	=	70.84	dcf
Y_d	= gas meter correction factor (dimensionless)	=	0.9906	
ΔH	= average pressure drop across meter box orifice (in. H_2O)	=	1.04	in. H_2O
17.64	= standard temperature to pressure ratio (°R/in. Hg)	=	17.64	°R/in. Hg
13.6	= conversion factor (in. H_2O/in. Hg)	=	13.6	in.H_2O/in. Hg
460	= °F to °R conversion constant	=	460	
V_{mstd}	= volume of gas sampled through the dry gas meter at standard conditions (dscf)	=	68.028	dscf

3. Sample gas pressure (in. Hg)

$$P_s = P_{bar} + \left(\frac{P_g}{13.6}\right)$$

Where:

P_{bar}	= barometric pressure (in. Hg)	=	29.70	in. Hg
P_g	= sample gas static pressure (in. H_2O)	=	-12.20	in. H_2O
13.6	= conversion factor (in. H_2O/in. Hg)	=	13.6	in. H_2O/in. Hg
P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg

4. Actual water vapor pressure at sample gas temperature less than 212°F (in. Hg)

$$P_v = \frac{e^{\left(18.3036 - \frac{3816.44}{\frac{5}{9}(T_s - 32) + 273.15 - 46.13}\right)}}{25.4}$$

Where:

T_s	= average sample gas temperature (°F)	=	298.96	°F
18.3036	= Antoine coefficient	=	18.3036	°K
3816.44	= Antoine coefficient	=	3816.44	°K
273.15	= temperature conversion factor	=	273.15	°K
46.13	= Antoine coefficient	=	46.13	°K
25.4	= conversion factor	=	25.4	mm Hg/in. Hg
5/9	= Fahrenheit to Celsius conversion factor	=	5/9	°C/°F
32	= temperature conversion (°F)	=	32	°F
P_v	= vapor pressure, actual (in. Hg)	=	28.80	in. Hg

5. Water vapor pressure at gas temperature greater than 212°F (in. Hg)

$$P_v = P_s$$

Where:

P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg
P_v	= water vapor pressure, actual (in. Hg)	=	28.80	in. Hg

6. Moisture measured in sample (% by volume)

$$B_{wo} = \frac{V_{wstd}}{(V_{mstd} + V_{wstd})}$$

Where:

V_{mstd}	= volume of gas sampled through the dry gas meter at standard conditions (dscf)	=	68.028	dscf
V_{wstd}	= volume of water collected at standard conditions (scf)	=	20.55	scf
B_{wo}	= proportion of water measured in the gas stream by volume	=	0.2320	
		=	23.20	%

7. Saturated moisture content (% by volume)

$$B_{ws} = \frac{P_v}{P_s}$$

Where:

P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg
P_v	= water vapor pressure, actual (in. Hg)	=	28.80	in. Hg
B_{ws}	= proportion of water vapor in the gas stream by volume at saturated conditions		1.0000	
		=	100.00	%

8. Actual water vapor in gas (% by volume)

$$B_w = MINIMUM \quad [B_{wo}, B_{ws}]$$

Where:

B_{ws}	= proportion of water vapor in the gas stream by volume at saturated conditions	=	1.0000	
B_{wo}	= proportion of water measured in the gas stream by volume	=	0.2320	
B_w	= actual water vapor in gas	=	0.2320	
		=	23.20	%

9. Nitrogen (plus carbon monoxide) in gas stream (% by volume, dry)

$$N_2 + CO = 100 - CO_2 - O_2$$

Where:

CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.4	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
100	= conversion factor (%)	=	100	%
N_2+CO	= proportion of nitrogen and CO in the gas stream by volume (%)	=	81.09	%

10. Molecular weight of dry gas stream (lb/lb·mole)

$$M_d = (M_{CO_2})\frac{(CO_2)}{(100)} + (M_{O_2})\frac{(O_2)}{(100)} + (M_{N_2+CO})\frac{(N_2+CO)}{(100)}$$

Where:

M_{CO2}	= molecular weight of carbon dioxide (lb/lb·mole)	=	44.00	lb/lb·mole
M_{O2}	= molecular weight of oxygen (lb/lb·mole)	=	32.00	lb/lb·mole
M_{N2+CO}	= molecular weight of nitrogen and carbon monoxide (lb/lb·mole)	=	28.00	lb/lb·mole
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.4	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
N_2+CO	= proportion of nitrogen and CO in the gas stream by volume (%)	=	81.1	%
100	= conversion factor (%)	=	100	%
M_d	= dry molecular weight of sample gas (lb/lb·mole)	=	30.00	lb/lb·mole

11. Molecular weight of sample gas (lb/lb·mole)

$$M_s = (M_d)(1 - B_w) + (M_{H_2O})(B_w)$$

Where:

B_w	= proportion of water vapor in the gas stream by volume	=	0.2320	
M_d	= dry molecular weight of sample gas (lb/lb·mole)	=	30.00	lb/lb·mole
M_{H2O}	= molecular weight of water (lb/lb·mole)	=	18.00	lb/lb·mole
M_s	= molecular weight of sample gas, wet basis (lb/lb·mole)	=	27.21	lb/lb·mole

12. Velocity of sample gas (ft/sec)

$$V_s = (K_p)(C_p)\left(\overline{\sqrt{\Delta P}}\right)\left(\sqrt{\frac{(\overline{T_s}+460)}{(M_s)(P_s)}}\right)$$

Where:

K_p	= velocity pressure constant	=	85.49	
C_p	= pitot tube coefficient	=	0.82	
M_s	= wet molecular weight of sample gas, wet basis (lb/lb·mole)	=	27.21	lb/lb·mole
P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg
T_s	= average sample gas temperature (°F)	=	298.96	°F
$\sqrt{\Delta P}$	= average square roots of velocity heads of sample gas (in. H_2O)	=	0.622	$\sqrt{}$in. H_2O
460	= °F to °R conversion constant	=	460	
V_s	= sample gas velocity (ft/sec)	=	43.12	ft/sec

13. Volumetric flow rate of sample gas at actual gas conditions (acfm)

$$Q_a = (60)(A_s)(V_s)$$

Where:

A_s	= cross sectional area of sampling location (ft^2)	=	64.00	ft^2
V_s	= sample gas velocity (ft/sec)	=	43.12	ft/sec
60	conversion factor (sec/min)	=	60	sec/min
Q_a	= volumetric flow rate at actual conditions (acfm)	=	165,567	acfm

14. Total flow of sample gas (scfm)

$$Q_s = (Q_a)\left(\frac{P_s}{29.92}\right)\left(\frac{68+460}{T_s+460}\right)$$

Where:

Q_a	= volumetric flow rate at actual conditions (acfm)	=	165,567	acfm
P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg
29.92	= standard pressure (in. Hg)	=	29.92	in. Hg
T_s	= average sample gas temperature (°F)	=	299.0	°F
68	= standard temperature (°F)	=	68	°F
460	= °F to °R conversion constant	=	460	
Q_s	= volumetric flow rate at standard conditions, wet basis (scfm)	=	110,883	scfm

15. Dry flow of sample gas (dscfm)

$$Q_{std} = (Q_s)(1 - B_w)$$

Where:

B_w	= proportion of water vapor in the gas stream by volume	=	0.2320	
Q_s	= volumetric flow rate at standard conditions, wet basis (scfm)	=	110,883	scfm
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm

16. Dry flow of sample gas corrected to 7%O_2 (dscfm)

$$Q_{std\,7} = (Q_{std})\left(\frac{20.9 - O_2}{20.9 - 7}\right)$$

Where:

Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
7	= oxygen content of corrected gas (%)	=	7.0	%
Q_{std7}	= volumetric flow rate at STP and 7%O_2, dry basis (dscfm)	=	75,600	dscfm

17. Hourly time basis conversion of volumetric flow rate (Q_{std} example)

$$Q_{std-hr} = (Q_{std-min})(60)$$

Where

$Q_{std\text{-}min}$	= volumetric flow rate, english units (ft^3/min)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
$Q_{std\text{-}hr}$	= volumetric flow rate, hourly basis (dscf/hr)	=	5,109,416	dscf/hr

18. Metric Conversion of Gas Volumes (Q_{std} example)

$$Q_{std-metric} = (Q_{std-english})\left(\frac{60}{35.31}\right)$$

Where:

$Q_{std\text{-}english}$	= volumetric flow rate, english units (ft^3/min)	=	85,157	dscfm
35.31	= conversion factor (ft^3/m^3)	=	35.31	ft^3/m^3
60	= conversion factor (min/hr)	=	60	min/hr
$Q_{std\text{-}metric}$	= volumetric flow rate, metric units (m^3/hr)	=	144,702	dry std m^3/hr

19. Standard to Normal Conversion of Gas Volumes (Q_{std} example)

$$Q_{Normal} = (Q_{std-metric})\left(\frac{32 + 460}{68 + 460}\right)$$

Where:

$Q_{std\text{-}metric}$	= volumetric flow rate, metric units (dry std m^3/hr)	=	144,702	dry std m^3/hr
32	= normal temperature (°F)	=	32	°F
68	standard temperature (°F)	=	68	°F
460	= standard temperature in Rankine (68°F)	=	460	
Q_{Normal}	= volumetric flow rate, metric units (dry Nm^3/hr)	=	134,836	dry Nm^3/hr

20. Percent isokinetic (%)

$$I = \frac{(0.09450)(\overline{T_s} + 460)(V_{mstd})}{(P_s)(V_s)(\frac{(D_n)^2(\pi)}{(144)(4)})(\Theta)(1 - B_w)}$$

Where:

D_n	= diameter of nozzle (in)	=	0.273	in.
B_w	= proportion of water vapor in the gas stream by volume	=	0.2320	
P_s	= absolute sample gas pressure (in. Hg)	=	28.80	in. Hg
T_s	= average sample gas temperature (°F)	=	299.0	°F
V_{mstd}	= volume of gas sample through the dry gas meter at standard conditions (dscf)	=	68.028	dscf
V_s	= sample gas velocity (ft/sec)	=	43.12	ft/sec
θ	= total sampling time (min)	=	125	min
0.0945	= conversion constant	=	0.0945	
460	= °F to °R conversion constant	=	460	
I	= percent of isokinetic sampling (%)	=	101.05	%

21. Alternative Method 5 Post-Test Meter Calibration Factor

$$Y_{qa} = \frac{\Theta}{V_m}\sqrt{\frac{(0.0319)(T_m + 460)(28.96)}{(\Delta H_@)(P_{bar} + \frac{\Delta H}{13.6})(M_d)}}(\sqrt{\Delta H})_{avg}$$

Where:

θ	= total sampling time (min)	=	125	min
V_m	= volume of gas sample through the dry gas meter at meter conditions (dcf)	=	70.84	dcf
T_m	= average dry gas meter temperature (°F)	=	81.86	°F
$\Delta H_@$	= dry gas meter orifice coefficient	=	1.8274	
P_{bar}	= barometric pressure (in. Hg)	=	29.70	in. Hg
ΔH	= average pressure drop across meter box orifice (in. H_2O)	=	1.037	in. H_2O
M_d	= dry molecular weight of sample gas (lb/lb·mole)	=	30.00	lb/lb·mole
$\sqrt{\Delta H_{avg}}$	= average of square root of pressure drop across meter orifice	=	1.015	√in. H_2O
0.0319	= conversion constant	=	0.0319	
28.96	= molecular weight of ambient air (lb/lb-mole)	=	28.96	lb/lb-mole
13.6	= conversion factor (in. H_2O/in. Hg)	=	13.6	in.H_2O/in. Hg
460	= °F to °R conversion constant	=	460	
Y_{qa}	= alternative Method 5 post-test meter calibration factor	=	0.9914	

USEPA Method 5/202 (FPM/CPM)
Sample Laboratory Analysis Calculations for FPM

Sample data taken from Run 1

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results, and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

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1. Residue mass of filter used in calculation

$$m_{fi-calc} = m_{fi} \quad \text{if } m_{fi} \geq MDL_f$$
$$m_{fi-calc} = (MDL_f)(F_r) \quad \text{if } m_{fi} < MDL_f$$

Where:

m_{f1}	= reported mass of filter "1" from gravimetric analysis (g)	=	0.00480	g
m_{f2}	= reported mass of filter "2" from gravimetric analysis (g)	=		g
m_{f3}	= reported mass of filter "3" from gravimetric analysis (g)	=		g
m_{f4}	= reported mass of filter "4" from gravimetric analysis (g)	=		g
MDL_f	= reported minimum gravimetric detection limit for filter fraction (g)	=	0.00010	g
F_r	= fraction of MDL applied to non-detectable run sample (g)	=	0.00	
$m_{f1-calc}$	= residue mass of filter "1" used in calculation (g)	=	0.00480	g
$m_{f2-calc}$	= residue mass of filter "2" used in calculation (g)	=		g
$m_{f3-calc}$	= residue mass of filter "3" used in calculation (g)	=		g
$m_{f4-calc}$	= residue mass of filter "4" used in calculation (g)	=		g

2. Total filter residue (g)

$$m_{filter} = \sum_{i=1}^{n} m_{fi-calc}$$

Where:

$m_{f1-calc}$	= residue mass of filter "1" used in calculation (g)	=	0.00480	g
$m_{f2-calc}$	= residue mass of filter "2" used in calculation (g)	=		g
$m_{f3-calc}$	= residue mass of filter "3" used in calculation (g)	=		g
$m_{f4-calc}$	= residue mass of filter "4" used in calculation (g)	=		g
m_{filter}	= total particulate collected on filters (g)	=	0.00480	g

3. Aliquot residue mass of blank sample used in calculation (g)

$$r_{ai-blank-calc} = r_{ai-blank} \quad \text{if } r_{ai-blank} \geq MDL_s$$
$$r_{ai-blank-calc} = (MDL_s)(F_b) \quad \text{if } r_{ai-blank} < MDL_s$$

Where:

			Acetone	
$r_{ai-blank}$	= aliquot residue mass of blank sample for solvent "i" (g)	=	0.00040	g
MDL_s	= reported minimum gravimetric detection limit for solvent rinse (g)	=	0.00010	g
F_b	= fraction of MDL applied to non-detectable blank sample (g)	=	0.00	
$r_{ai-blank-calc}$	= aliquot residue mass of blank sample for solvent "i" used in calculation (g)	=	0.00040	g

4. Aliquot residue mass of run sample used in calculation (g)

$$r_{ai-calc} = r_{ai} \quad \text{if } r_{ai} \geq MDL_s$$
$$r_{ai-calc} = (MDL_s)(F_r) \quad \text{if } r_{ai} < MDL_s$$

Where:

			Acetone	
r_{ai}	= aliquot residue mass of run sample for solvent "i" (g)	=	0.00700	g
MDL_s	= reported minimum gravimetric detection limit for solvent rinse (g)	=	0.00010	g
F_r	= fraction of MDL applied to non-detectable run sample (g)	=	1.00	
$r_{ai-calc}$	= aliquot residue mass of run sample for solvent "i" used in calculation (g)	=	0.00700	g

5. Residue mass of run sample (g)

$$r_{si} = \left(r_{ai-calc}\right)\left(\frac{v_{si}}{v_{ai}}\right)$$

Where:			Acetone	
$r_{ai-calc}$	= aliquot residue mass of run sample for solvent "i" used in calculation (g)	=	0.00700	g
v_{si}	= liquid volume of run sample for solvent rinse "i" (mL)	=	74	mL
v_{ai}	= aliquot volume use for solvent rinse "i" (mL) used in gravimetric analysis (mL)	=	74	mL
r_{si}	= residue mass of run sample for solvent rinse "i" (g)	=	0.00700	g

6. Maximum allowable blank correction for solvent rinse (g)

$$m_{bi} = MINIMUM\left[\left(\frac{\left(r_{ai-blank-calc}\right)\left(v_{si}\right)}{v_{ai-blank}}\right) \; or \; \left(0.00001\right)\left(\rho_i\right)\left(v_{si}\right) \; or \; \left(r_{si}\right)\right]$$

Where:			Acetone	
$r_{ai-blank-calc}$	= blank aliquot residue mass for solvent "i" used in calculation (g)	=	0.00040	g
v_{si}	= liquid volume of run sample for solvent rinse "i" (mL)	=	74.0	mL
$v_{ai-blank}$	= liquid volume of blank sample for solvent rinse "i" (mL)	=	144.0	mL
0.00001	= EPA M-5 fraction of total rinse that can be subtracted (g)	=	0.00001	
ρ_i	= density of solvent rinse "i" (g/mL)	=	0.7845	g/ml
r_{ai}	= residue mass of run sample for solvent rinse "i" (g)	=	0.00700	g
m_{bi}	= maximum allowable blank correction for solvent rinse "i" (g)	=	0.00021	g

The first part of the expression is used for solvent rinse 1; the blank is the concentration of the blank, times the size of the sample

7. Net residue mass of run sample (g)

$$m_i = \left(r_{si} - m_{bi}\right)$$

Where:			Acetone	
r_{si}	= residue mass of run sample for solvent rinse "i" (g)	=	0.00700	g
m_{bi}	= maximum allowable blank correction for solvent rinse "i" (g)	=	0.00021	g
m_i	= net residue mass of run sample for solvent rinse "i" (g)	=	0.00679	g

8. Total solvent residue - (g)

$$m_s = \sum_{i=1}^{n} m_i$$

Where:				
m_1	= net residue mass of solvent rinse "1" (g)	=	0.00679	g
m_2	= net residue mass of solvent rinse "2" (g)	=	N/A	g
m_3	= net residue mass of solvent rinse "3" (g)	=	N/A	g
m_s	= total solvent residue (g)	=	0.00679	g

9. Total gravimetric result (g)

$$m_T = m_{filter} + m_s$$

Where:				
m_{filter}	= total particulate collected on filters (g)	=	0.00480	g
m_s	= total solvent residue (g)	=	0.00679	g
m_T	= total gravimetric result (g)	=	0.01159	g

10. Total gravimetric detection limit (g)

$$m_D = (MDL_f)(n_f) + (MDL_s)(n_s)$$

Where:

MDL_f	= reported minimum gravimetric detection limit for filter fraction (g)	=	0.00010	g
n_f	= number of filters in analysis	=	1	
MDL_s	= reported minimum gravimetric detection limit for solvent rinse (g)	=	0.00010	g
n_s	= number of solvent rinses in analysis	=	1	
m_D	= total gravimetric detection limit (g)	=	0.00020	g

11. Total filterable particulate matter (g)

$$m_n = MAXIMUM[m_T \quad or \quad m_D]$$

Where:

m_T	= total gravimetric result (g)	=	0.01159	g
m_D	= total gravimetric detection limit (g)	=	0.00020	g
m_n	= total filterable particulate matter (g)	=	0.01159	g

USEPA Method 5/202 (FPM/CPM)
Sample Emission Calculations for FPM

Sample data taken from Run 1

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1. Filterable particulate matter concentration (lb/dscf)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(2.205\times10^{-3}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
C_{sd}	= filterable particulate matter concentration (lb/dscf)	=	3.758E-07	lb/dscf

2. Filterable particulate matter concentration (gr/dscf)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(15.43\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
15.43	= conversion factor (gr/g)	=	15.43	gr/g
C_{sd}	= filterable particulate matter concentration (gr/dscf)	=	0.00263	gr/dscf

3. Filterable particulate matter concentration (mg/dscm)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(1000\right)\left(35.31\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
1000	= conversion factor (mg/g)	=	1000	mg/g
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
C_{sd}	= filterable particulate matter concentration (mg/dscm)	=	6.01809	mg/dscm

4. Filterable particulate matter concentration (mg/Nm3 dry)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(1000\right)\left(35.31\right)\left(\frac{68+460}{32+460}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
1000	= conversion factor (mg/g)	=	1000	mg/g
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
68	= standard temperature (°F)	=	68	°F
32	= normal temperature (°F)	=	32	°F
460	= °F to °R conversion constant	=	460	
C_{sd}	= filterable particulate matter concentration (mg/Nm3 dry)	=	6.45844	mg/Nm^3 dry

5. Filterable particulate matter concentration corrected to x% O2 (gr/dscf example)

$$C_{sdx} = C_{sd}\left(\frac{20.9 - x}{20.9 - O_2}\right)$$

Where:

C_{sd}	= filterable particulate matter concentration (gr/dscf)	=	0.00263	gr/dscf
x	= oxygen content of corrected gas (%)	=	7.0	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
C_{odx}	= filterable particulate matter concentration corrected to x%O2 (gr/dscf)	=	0.00296	gr/dscf @ x%O_2

6. Filterable particulate matter concentration corrected to y% CO2 (gr/dscf example)

$$C_{sdy} = C_{sd}\left(\frac{y}{CO_2}\right)$$

Where:

C_{sd}	= filterable particulate matter concentration (gr/dscf)	=	0.00263	gr/dscf
y	= carbon dioxide content of corrected gas (%)	=	12.0	%
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.4	%
C_{sdy}	= filterable particulate matter concentration corrected to y%CO2 (gr/dscf)	=	0.00305	gr/dscf @ y%CO_2

7. Filterable particulate matter concentration at actual gas conditions (gr/acf example)

$$C_a = C_{sd}\left(\frac{Q_{std}}{Q_a}\right)$$

Where:

C_{sd}	= filterable particulate matter concentration (gr/dscf)	=	0.00263	gr/dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
Q_a	= volumetric flow rate at actual conditions (acfm)	=	165,567	acfm
C_a	= filterable particulate matter concentration at actual gas conditions (gr/acf)	=	0.00135	gr/acf

8. Filterable particulate matter rate (lb/hr)

$$E_{lb/hr} = \left(\frac{m_n}{V_{mstd}}\right)\left(2.205\times10^{-3}\right)\left(Q_{std}\right)\left(60\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
$E_{lb/hr}$	= filterable particulate matter rate (lb/hr)	=	1.9202	lb/hr

9. Filterable particulate matter rate (kg/hr)

$$E_{kg/hr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{(Q_{std})(60)}{1000}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
1000	= conversion factor (g/kg)	=	1000	g/kg
$E_{kg/hr}$	= filterable particulate matter rate (kg/hr)	=	0.8708	kg/hr

10. Filterable particulate matter rate (Ton/yr)

$$E_{T/yr} = \left(\frac{m_n}{V_{mstd}}\right)\left(2.205\times10^{-3}\right)(Q_{std})(60)\left(\frac{Cap}{2000}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
Cap	= capacity factor for process (hours operated/year)	=	8,760	hours/yr
2000	= conversion factor (lb/Ton)	=	2000	lb/Ton
$E_{T/yr}$	= filterable particulate matter rate (Ton/yr)	=	8.4104	Ton/yr

11. Filterable particulate matter rate - Fd-based (lb/MMBtu)

$$E_{Fd} = \left(\frac{m_n}{V_{mstd}}\right)\left(2.205\times10^{-3}\right)(F_d)\left(\frac{20.9}{20.9-O_2}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
F_d	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	9,570	dscf/MMBtu
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
E_{Fd}	= filterable particulate matter rate - Fd-based (lb/MMBtu)	=	0.00609	lb/MMBtu

12. Filterable particulate matter rate - Fc-based (lb/MMBtu)

$$E_{Fc} = \left(\frac{m_n}{V_{mstd}}\right)\left(2.205\times10^{-3}\right)(F_c)\left(\frac{100}{CO_2}\right)$$

Where:

m_n	= total filterable particulate matter (g)	=	0.01159	g
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
F_c	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	1,820	dscf/MMBtu
CO_2	= proportion of oxygen in the gas stream by volume (%)	=	10.4	%
100	= conversion factor	=	100	
E_{Fc}	= filterable particulate matter rate - Fc-based (lb/MMBtu)	=	0.00661	lb/MMBtu

LOGIC FOR TREATING DETECTION LIMITS

(all metals except mercury)

1. Logic for Determining Maximum Allowable Front-Half Blank Correction ($m_{FB\text{-}allow}$)

	CASE 1 m_{FB} = D	CASE 2 m_{FB} = ND
Rule		
ND = 0	$m_{FB\text{-}allow}$ = M29 Rule	$m_{FB\text{-}allow}$ = 0
ND=1x	$m_{FB\text{-}allow}$ = M29 Rule	$m_{FB\text{-}allow}$ = 0
ND=0.5x	$m_{FB\text{-}allow}$ = M29 Rule	$m_{FB\text{-}allow}$ = 0

2. Logic for Determining Blank-Corrected Front-Half Sample Amount (m_F)

	CASE 1 $m_{FS} - m_{FB\text{-}allow} \geq$ MDL	CASE 2 $m_{FS} - m_{FB\text{-}allow} <$ MDL
Rule		
ND = 0	$m_F = m_{FS} - m_{FB\text{-}allow}$	$m_F =$ < MDL
ND=1x	$m_F = m_{FS} - m_{FB\text{-}allow}$	$m_F =$ < MDL
ND=0.5x	$m_F = m_{FS} - m_{FB\text{-}allow}$	$m_F =$ < MDL

3. Logic for Determining Maximum Allowable Back-Half Blank Correction ($m_{BB\text{-}allow}$)

	CASE 1 m_{BB} = D	CASE 2 m_{BB} = ND
Rule		
ND = 0	$m_{BB\text{-}allow}$ = M29 Rule	$m_{BB\text{-}allow}$ = 0
ND=1x	$m_{BB\text{-}allow}$ = M29 Rule	$m_{BB\text{-}allow}$ = 0
ND=0.5x	$m_{BB\text{-}allow}$ = M29 Rule	$m_{BB\text{-}allow}$ = 0

4. Logic for Determining Blank-Corrected Back-Half Sample Amount (m_B)

	CASE 1 $m_{BS} - m_{BB\text{-}allow} \geq$ MDL	CASE 2 $m_{BS} - m_{BB\text{-}allow} <$ MDL
Rule		
ND = 0	$m_B = m_{BS} - m_{BB\text{-}allow}$	$m_B =$ < MDL
ND=1x	$m_B = m_{BS} - m_{BB\text{-}allow}$	$m_B =$ < MDL
ND=0.5x	$m_B = m_{BS} - m_{BB\text{-}allow}$	$m_B =$ < MDL

5. Logic for Adding Front and Back-Half Corrected Samples (m_n)

	CASE 1 Both are D	CASE 2 One is D, other is ND	CASE 3 Both are ND
Rule			
ND = 0	$m_n = m_F + m_B$	m_n = D	$m_n =$ < Sum ND
ND=1x	$m_n = m_F + m_B$	$m_n =$ < [D + ND]	$m_n =$ < Sum ND
ND=0.5x	$m_n = m_F + m_B$	$m_n =$ <[D + 0.5ND]	$m_n =$ < 0.5 Sum ND

Definitions and Notes

The term "Rule" refers to the rule being implemented for hanMDLing non-detectable quantities in summations
MDL = minimum detection limit.
D = Detectable quantity reported as D.
ND = Non-Detectable quantity reported at a value of ND.
If Front and Back-Half fractions are combined, then only Items 1 and 2 are used.

USEPA Method 5/29 (Particulate/Metals)
Cadmium Analyte Calculations

Sample data taken from Run 1

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results, and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

Note: Please see the preceding page concerning treatment of minimum detection limits and mathematical operations on values that are below minimum detection limits.

042213 133416
L

1. Maximum front-half blank correction criteria (µg)

$$A = (1.4)\left(\frac{3.141593}{4}\right)\left(\frac{D}{2.54}\right)^2$$

Where:

D	= diameter of filter used in sample apparatus	=	8.2	cm
1.4	= allowable blank per square inch of filter area	=	1.4	µg/in^2
2.54	= conversion constant	=	2.54	cm/in
4	= conversion constant	=	4	
3.141593	= conversion constant (pi)	=	3.141593	
A	= maximum front-half blank correction criteria	=	12.46	µg

2. Allowable blank correction - combined front and back-half sample fractions (µg)

$$m_{FB-allow} = m_{FB} \text{ if } m_{FB} \le A + 1$$

$$m_{FB-allow} = MAX\left[A + 1,\ MIN\left(m_{FB},\ 0.05 \times m_{FS}\right)\right] \text{ if } m_{FB} > A + 1$$

Where:

m_{FB}	= cadmium amount in combined front- and back-half blank	=	<0.2000	µg
m_{FS}	= cadmium amount in combined front- and back-half sample	=	2.0285	µg
A+1	= max combined front- & back-half blank correction criteria	=	12.46	µg
0.05 x m_{FS}	= 5% of combined front- and back-half sample amount	=	0.1014	µg
MAX	= arithmetic operator that returns the maximum of two values			
MIN	= arithmetic operator that returns the minimum of two values			
$m_{FB-allow}$	= allowable combined Cadmium blank correction	=	0.0000	µg

NOTE: In this case, the first criteria applies.

3. Combined front- and back-half sample corrected for allowable blank (µg)

$$m_n = m_{FS} - m_{FB-allow}$$

Where:

m_{FS}	= cadmium amount in combined front- and back-half sample	=	2.0285	µg
$m_{FB-allow}$	= allowable combined cadmium blank correction	=	0.0000	µg
m_n	= blank-corrected cadmium in combined sample	=	2.0285	µg

USEPA Method 5/29 (Particulate/Metals)
Cadmium Sample Calculations

Sample data taken from Run 1

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results, and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

042213 133416
N_L

1. Cadmium concentration (lb/dscf)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^6}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
C_{sd}	= cadmium concentration (lb/dscf)	=	6.5751E-11	lb/dscf

2. Cadmium concentration (µg/dscm)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)(35.31)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
C_{sd}	= cadmium concentration (µg/dscm)	=	1.0529E+00	µg/dscm

3. Cadmium concentration (mg/dscm)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{35.31}{1000}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
1000	= conversion factor (µg/mg)	=	1000	µg/mg
C_{sd}	= cadmium concentration (mg/dscm)	=	1.0529E-03	mg/dscm

4. Cadmium concentration (µg/Nm3 dry)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)(35.31)\left(\frac{68+460}{32+460}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
68	= standard temperature (°F)	=	68	°F
32	= normal temperature (°F)	=	32	°F
460	= °F to °R conversion constant	=	460	
C_{sd}	= cadmium concentration (µg/Nm3 dry)	=	1.1300E+00	µg/Nm^3 dry

5. Cadmium concentration corrected to x% oxygen (lb/dscf example)

$$C_{sdx} = C_{sd}\left(\frac{20.9-x}{20.9-O_2}\right)$$

Where:

C_{sd}	= cadmium concentration (lb/dscf)	=	6.5751E-11	lb/dscf
x	= oxygen content of corrected gas (%)	=	7.0	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
C_{sdx}	= cadmium concentration corrected to x% oxygen (lb/dscf)	=	7.4063E-11	lb/dscf @ x%O_2

6. Cadmium concentration corrected to y% carbon dioxide (lb/dscf example)

$$C_{sdy} = C_{sd}\left(\frac{y}{CO_2}\right)$$

Where:

C_{sd}	= cadmium concentration (lb/dscf)	=	6.5751E-11	lb/dscf
y	= carbon dioxide content of corrected gas (%)	=	12.0	%
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.4	%
C_{sdy}	= cadmium conc. corrected to y% carbon dioxide (lb/dscf)	=	7.6233E-11	lb/dscf @ y%CO_2

7. Cadmium concentration at actual gas conditions (lb/acf example)

$$C_a = C_{sd}\left(\frac{Q_{std}}{Q_a}\right)$$

Where:

C_{sd}	= cadmium concentration (lb/dscf)	=	6.5751E-11	lb/dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
Q_a	= volumetric flow rate at actual conditions (acfm)	=	165,567	acfm
C_a	= cadmium concentration at actual gas conditions (lb/acf)	=	3.3818E-11	lb/acf

8. Cadmium emission rate (lb/hr)

$$E_{lb/hr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(Q_{std})(60)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
$E_{lb/hr}$	= cadmium emission rate (lb/hr)	=	3.3595E-04	lb/hr

9. Cadmium emission rate (g/s)

$$E_{g/s} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{Q_{std}}{(10^6)(60)}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
60	= conversion factor (sec/min)	=	60	sec/min
$E_{g/s}$	= cadmium emission rate (g/s)	=	4.2322E-05	g/s

10. Cadmium emission rate (Ton/yr)

$$E_{T/yr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(Q_{std})(60)\left(\frac{Cap}{2000}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
Cap	= capacity factor for process (hours operated/year)	=	8,760	hours/yr
2000	= conversion factor (lb/Ton)	=	2000	lb/Ton
$E_{Ton/yr}$	= cadmium emission rate (Ton/yr)	=	1.4715E-03	Ton/yr

11. Cadmium emission rate - Fd-based (lb/MMBtu)

$$E_{Fd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(F_d)\left(\frac{20.9}{20.9 - O_2}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
F_d	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	9,570	dscf/MMBtu
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
E_{Fd}	= cadmium emission rate - Fd-based (lb/MMBtu)	=	1.0657E-06	lb/MMBtu

12. Cadmium emission rate - Fc-based (lb/MMBtu)

$$E_{Fc} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(F_c)\left(\frac{100}{CO_2}\right)$$

Where:

m_n	= cadmium collected in sample (total µg)	=	2.0285	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
F_c	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	1,820	dscf/MMBtu
CO_2	= proportion of oxygen in the gas stream by volume (%)	=	10.4	%
100	= conversion factor	=	100	
E_{Fc}	= cadmium emission rate - Fc-based (lb/MMBtu)	=	1.1562E-06	lb/MMBtu

LOGIC FOR TREATING DETECTION LIMITS

(mercury only)

1. Logic for Determining Total Blank ($m_{Total-B}$) from 5 Fractions

	CASE 1 All 5 fractions are D.	CASE 2 1 to 4 fractions are ND	CASE 3 All 5 fractions are ND
Rule			
ND = 0	$m_{Total-B}$ = Sum D, 1-5	$m_{Total-B}$ = Sum D	$m_{Total-B}$ = < Sum ND
ND=1x	$m_{Total-B}$ = Sum D, 1-5	$m_{Total-B}$ = Sum D	$m_{Total-B}$ = < Sum ND
ND=0.5x	$m_{Total-B}$ = Sum D, 1-5	$m_{Total-B}$ = Sum D	$m_{Total-B}$ = < 0.5 Sum ND

2. Logic for Determining Total Sample ($m_{Total-S}$) from 5 Fractions

	CASE 1 All 5 fractions are D.	CASE 2 1 to 4 fractions are ND	CASE 3 All 5 fractions are ND
Rule			
ND = 0	$m_{Total-S}$ = Sum D, 1-5	$m_{Total-S}$ = Sum D	$m_{Total-S}$ = < Sum ND
ND=1x	$m_{Total-S}$ = Sum D, 1-5	$m_{Total-S}$ = < [Sum D + Sum ND]	$m_{Total-S}$ = < Sum ND
ND=0.5x	$m_{Total-S}$ = Sum D, 1-5	$m_{Total-S}$ = < [SumD+0.5 SumND]	$m_{Total-S}$ = < 0.5 Sum ND

3. Logic for Determining Maximum Allowable Blank Correction ($m_{T-B-allow}$)

	CASE 1 All 5 fractions are D. $m_{Total-B}$ = D	CASE 2 1 to 4 sample fractions are ND $m_{Total-B}$ = D	CASE 3 All 5 fractions are ND $m_{Total-B}$ = D	CASE 4 Any type of fractions $m_{Total-B}$ = ND
Rule				
ND = 0	$m_{T-B-allow}$ = M29 Rule	$m_{T-B-allow}$ = M29 Rule*	$m_{T-B-allow}$ = 0	$m_{T-B-allow}$ = 0
ND=1x	$m_{T-B-allow}$ = M29 Rule	$m_{T-B-allow}$ = M29 Rule*	$m_{T-B-allow}$ = 0	$m_{T-B-allow}$ = 0
ND=0.5x	$m_{T-B-allow}$ = M29 Rule	$m_{T-B-allow}$ = M29 Rule*	$m_{T-B-allow}$ = 0	$m_{T-B-allow}$ = 0

* M29 rule using only detected sample quantities for logical comparisons.

4. Logic for Determining Blank-Corrected Sample Amount (m_n)

	CASE 1 All 5 fractions are D. $m_{Total-S} - m_{T-B-allow} \geq$ MIN(MDL)	CASE 2 1 to 4 sample fractions are ND $m_{Total-S} - m_{T-B-allow} \geq$ MIN(MDL)	CASE 3 All 5 fractions are ND $m_{Total-S}$ and $m_{T-B-allow}$ anything	CASE 4 Any type of fractions $m_{Total-S} - m_{T-B-allow}$ < MIN(MDL)
Rule				
ND = 0	$m_n = m_{Total-S} - m_{T-B-allow}$	$m_n = m_{Total-S} - m_{T-B-allow}$	m_n = < $m_{Total-S}$	m_n = < MIN[MDL]
ND=1x	$m_n = m_{Total-S} - m_{T-B-allow}$	m_n = < [$m_{Total-S} - m_{T-B-allow}$]	m_n = < $m_{Total-S}$	m_n = < MIN[MDL]
ND=0.5x	$m_n = m_{Total-S} - m_{T-B-allow}$	m_n = < [$m_{Total-S} - m_{T-B-allow}$]	m_n = < $m_{Total-S}$	m_n = < MIN[MDL]

Definitions and Notes

The term "Rule" refers to the rule being implemented for handling non-detectable quantities in summations.
MDL = minimum detection limit.
D = Detectable quantity reported as D.
ND = Non-Detectable quantity reported at a value of ND.
MIN[MDL] = lowest quantity of all detection limits for 5 fractions.

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USEPA Method 5/29 (Mercury)
Mercury Analyte Calculations

Sample data taken from Run 1

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Note: Please see the preceding page concerning treatment of minimum detection limits and mathematical operations on values that are below minimum detection limits.

042213 133653
L

1. Total blank amount (µg)

$$m_{total-B} = \sum_{i=1}^{n} m_{i-B}$$

Where:

m_{1b-B}	= mercury amount in blank for Fraction 1b	=	<0.1000	µg
m_{2b-B}	= mercury amount in blank for Fraction 2b	=	<0.2000	µg
m_{3a-B}	= mercury amount in blank for Fraction 3a	=	<0.2000	µg
m_{3b-B}	= mercury amount in blank for Fraction 3b	=	<0.5000	µg
m_{3c-B}	= mercury amount in blank for Fraction 3c	=	<0.4000	µg
$m_{total-B}$	= total amount of mercury in blank	=	<1.4000	µg

2. Total sample amount (µg)

$$m_{total-S} = \sum_{i=1}^{n} m_{i-S}$$

Where:

m_{1b-S}	= mercury amount in sample for Fraction 1b	=	<0.1000	µg
m_{2b-S}	= mercury amount in sample for Fraction 2b	=	0.8805	µg
m_{3a-S}	= mercury amount in sample for Fraction 3a	=	<0.2000	µg
m_{3b-S}	= mercury amount in sample for Fraction 3b	=	<0.5000	µg
m_{3c-S}	= mercury amount in sample for Fraction 3c	=	<0.4000	µg
$m_{total-S}$	= total amount of mercury in sample	=	0.8805	µg

3. Allowable blank correction (µg)

$$m_{T-B-allow} = m_{total-B} \text{ if } m_{total-B} \le 0.6$$

$$m_{T-B-allow} = MAX\left[0.6,\ MIN\left(m_{total-B},\ 0.05 \times m_{total-S}\right)\right] \text{ if } m_{total-B} > 0.6$$

Where:

$m_{total-B}$	= total amount of mercury in blank	=	<1.4000	µg
$m_{total-S}$	= total amount of mercury in sample	=	0.8805	µg
0.05 x $m_{total-S}$	= 5% of $m_{total-S}$	=	0.0440	µg
MAX	= arithmetic operator that returns the maximum of two values			
MIN	= arithmetic operator that returns the minimum of two values			
$m_{T-B-allow}$	= total allowable blank correction	=	0.0000	µg

NOTE: In this case, the second criteria applies.

4. Sample corrected for allowable blank - Total (µg)

$$m_n = m_{total-S} - m_{T-B-allow}$$

Where:

$m_{total-S}$	= total amount of mercury in sample	=	0.8805	µg
$m_{T-B-allow}$	= total allowable blank correction	=	0.0000	µg
m_n	= total mercury in sample corrected for allowable blank	=	0.8805	µg

5. Sample corrected for allowable blank - Prorated for each fraction (µg)

$$m_{n-i} = \left(\frac{m_{i-S}}{m_{total-S}}\right)(m_n)$$

Where:

m_n	= total mercury in sample corrected for allowable blank	=	0.8805	µg
m_{1b-S}	= mercury amount in sample for Fraction 1b	=	<0.1000	µg
m_{2b-S}	= mercury amount in sample for Fraction 2b	=	0.8805	µg
m_{3a-S}	= mercury amount in sample for Fraction 3a	=	<0.2000	µg
m_{3b-S}	= mercury amount in sample for Fraction 3b	=	<0.5000	µg
m_{3c-S}	= mercury amount in sample for Fraction 3c	=	<0.4000	µg
$m_{total-S}$	= total amount of mercury in sample	=	0.8805	µg
m_{n-1b}	= mercury corrected for blank - prorated for Fraction 1b	=	<0.1000	µg
m_{n-2b}	= mercury corrected for blank - prorated for Fraction 2b	=	0.8805	µg
m_{n-3a}	= mercury corrected for blank - prorated for Fraction 3a	=	<0.2000	µg
m_{n-3b}	= mercury corrected for blank - prorated for Fraction 3b	=	<0.5000	µg
m_{n-3c}	= mercury corrected for blank - prorated for Fraction 3c	=	<0.4000	µg

USEPA Method 5/29 (Mercury)
Mercury Sample Calculations

Sample data taken from Run 1

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results, and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

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1. Mercury concentration (lb/dscf)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^6}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
C_{sd}	= mercury concentration (lb/dscf)	=	2.8540E-11	lb/dscf

2. Mercury concentration (µg/dscm)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)(35.31)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
C_{sd}	= mercury concentration (µg/dscm)	=	4.5703E-01	µg/dscm

3. Mercury concentration (mg/dscm)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{35.31}{1000}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
1000	= conversion factor (µg/mg)	=	1000	µg/mg
C_{sd}	= mercury concentration (mg/dscm)	=	4.5703E-04	mg/dscm

4. Mercury concentration (µg/Nm3 dry)

$$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)(35.31)\left(\frac{68+460}{32+460}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm
68	= standard temperature (°F)	=	68	°F
32	= normal temperature (°F)	=	32	°F
460	= °F to °R conversion constant	=	460	
C_{sd}	= mercury concentration (µg/Nm3 dry)	=	4.9048E-01	µg/Nm^3 dry

5. Mercury concentration corrected to x% oxygen (lb/dscf example)

$$C_{sdx} = C_{sd}\left(\frac{20.9-x}{20.9-O_2}\right)$$

Where:

C_{sd}	= mercury concentration (lb/dscf)	=	2.8540E-11	lb/dscf
x	= oxygen content of corrected gas (%)	=	7.0	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
C_{sdx}	= mercury concentration corrected to x% oxygen (lb/dscf)	=	3.2148E-11	lb/dscf @ x%O_2

6. Mercury concentration corrected to y% carbon dioxide (lb/dscf example)

$$C_{sdy} = C_{sd}\left(\frac{y}{CO_2}\right)$$

Where:

C_{sd}	= mercury concentration (lb/dscf)	=	2.8540E-11	lb/dscf
y	= carbon dioxide content of corrected gas (%)	=	12.0	%
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.4	%
C_{sdy}	= mercury conc. corrected to y% carbon dioxide (lb/dscf)	=	3.3090E-11	lb/dscf @ y%CO_2

7. Mercury concentration at actual gas conditions (lb/acf example)

$$C_a = C_{sd}\left(\frac{Q_{std}}{Q_a}\right)$$

Where:

C_{sd}	= mercury concentration (lb/dscf)	=	2.8540E-11	lb/dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
Q_a	= volumetric flow rate at actual conditions (acfm)	=	165,567	acfm
C_a	= mercury concentration at actual gas conditions (lb/acf)	=	1.4679E-11	lb/acf

8. Mercury emission rate (lb/hr)

$$E_{lb/hr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^6}\right)(Q_{std})(60)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
$E_{lb/hr}$	= mercury emission rate (lb/hr)	=	1.4582E-04	lb/hr

9. Mercury emission rate (g/s)

$$E_{g/s} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{Q_{std}}{(10^6)(60)}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
60	= conversion factor (sec/min)	=	60	sec/min
$E_{g/s}$	= mercury emission rate (g/s)	=	1.8370E-05	g/s

10. Mercury emission rate (Ton/yr)

$$E_{T/yr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^6}\right)(Q_{std})(60)\left(\frac{Cap}{2000}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,157	dscfm
60	= conversion factor (min/hr)	=	60	min/hr
Cap	= capacity factor for process (hours operated/year)	=	8,760	hours/yr
2000	= conversion factor (lb/Ton)	=	2000	lb/Ton
$E_{T/yr}$	= mercury emission rate (Ton/yr)	=	6.3871E-04	Ton/yr

11. Mercury emission rate - Fd-based (lb/MMBtu)

$$E_{Fd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(F_d)\left(\frac{20.9}{20.9 - O_2}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
F_d	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	9,570	dscf/MMBtu
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%
E_{Fd}	= mercury emission rate - Fd-based (lb/MMBtu)	=	4.6260E-07	lb/MMBtu

12. Mercury emission rate - Fc-based (lb/MMBtu)

$$E_{Fc} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205 \times 10^{-3}}{10^6}\right)(F_c)\left(\frac{100}{CO_2}\right)$$

Where:

m_n	= mercury collected in sample (total µg)	=	0.8805	µg
V_{mstd}	= volume metered, standard (dscf)	=	68.0282	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g
10^6	= conversion factor (µg/g)	=	1.0E+06	µg/g
F_c	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	1,820	dscf/MMBtu
CO_2	= proportion of oxygen in the gas stream by volume (%)	=	10.4	%
100	= conversion factor	=	100	
E_{Fc}	= mercury emission rate - Fc-based (lb/MMBtu)	=	5.0187E-07	lb/MMBtu

USEPA Method 23 (PCDD/F)
PCDD/PCDF Emissions Calculations

Sample data taken from Run 2

Note: The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

Note: PCDD/F results may be presented in two formats - normally expected levels and the maximum possible levels. In the normal case, data classified as ND (non-detect) or EMPC (estimated maximum possible concentration) are not counted. In the maximum possible emissions case, NDs and EMPCs are fully counted.

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			Normal Case (ND & EMPC = 0)		Maximum Case (ND & EMPC fully counted)	
1. PCDDF concentration (ng/dscm)						
$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right) \times 35.31$						
Where:						
m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm	35.31	dscf/dscm
C_{sd}	= PCDD/F concentration (ng/dscm)	=	3.7801E+00	ng/dscm	3.8060E+00	ng/dscm
2. PCDDF concentration (ng/Nm3 dry)						
$C_{sd} = \left(\frac{m_n}{V_{mstd}}\right)(35.31)\left(\frac{68+460}{32+460}\right)$						
Where:						
m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
35.31	= conversion factor (dscf/dscm)	=	35.31	dscf/dscm	35.31	dscf/dscm
68	= standard temperature (°F)	=	68	°F	68	°F
32	= normal temperature (°F)	=	32	°F	32	°F
460	= °F to °R conversion constant	=	460		460	
C_{sd}	= PCDD/F concentration (ng/Nm3 dry)	=	4.0567E+00	ng/Nm^3 dry	4.0845E+00	ng/Nm^3 dry
3. PCDDF concentration at actual gas conditions (ng/acm example)						
$C_a = C_{sd}\left(\frac{Q_{std}}{Q_a}\right)$						
Where:						
C_{sd}	= PCDD/F concentration (ng/dscm)	=	3.7801E+00	ng/dscm	3.8060E+00	ng/dscm
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscm/h)	=	145,575	dry std m^3/hr	145,575	dry std m^3/hr
Q_a	= volumetric flow rate at actual conditions (acm/h)	=	270,706	actual m^3/hr	270,706	actual m^3/hr
C_a	= PCDD/F TEQ concentration at actual gas conditions (ng/acm)	=	2.0328E+00	ng/acm	2.0467E+00	ng/acm
4. PCDDF concentration corrected to x% O2 (ng/dscm example)						
$C_{sdx} = C_{sd}\left(\frac{20.9-x}{20.9-O_2}\right)$						
Where:						
C_{sd}	= PCDD/F concentration (ng/dscm)	=	3.7801E+00	ng/dscm	3.8060E+00	ng/dscm
x	= oxygen content of corrected gas (%)	=	7.0	%	7.0	%
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%	20.9	%
C_{sdx}	= PCDD/F concentration (ng/dscm corrected to x% O_2)	=	4.2823E+00	ng/dscm @	4.3116E+00	ng/dscm @

					x% O_2	x% O_2

5. PCDDF concentration corrected to y% CO2 (ng/dscm example)

$$C_{sdy} = C_{sd}\left(\frac{y}{CO_2}\right)$$

Where:

C_{sd}	= PCDD/F concentration (ng/dscm)	=	3.7801E+00	ng/dscm	3.8060E+00	ng/dscm
y	= carbon dioxide content of corrected gas (%)	=	12.0	%	12.0	%
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.3	%	10.3	%
C_{sdy}	= PCDD/F concentration (ng/dscm corrected to y% CO_2)	=	4.3870E+00	ng/dscm @ y% CO_2	4.4170E+00	ng/dscm @ y% CO_2

6. PCDDF Emission rate (lb/hr)

$$E_{lb/hr} = \left(\frac{m_n}{V_{mstd}}\right)(2.205\times10^{-3})(Q_{std})\frac{(60)}{(10^9)}$$

Where:

m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g	2.205E-03	lb/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,671	dscfm	85,671	dscfm
60	= conversion factor (min/hr)	=	60	min/hr	60	min/hr
10^9	= conversion factor to convert from ng to grams	=	1.0E+09	ng/g	1.0E+09	ng/g
$E_{lb/hr}$	= PCDDF Emission rate (lb/hr)	=	1.2134E-06	lb/hr	1.2217E-06	lb/hr

7. PCDDF Emission rate (g/sec)

$$E_{g/sec} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{Q_{std}}{60\times10^9}\right)$$

Where:

m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,671	dscfm	85,671	dscfm
60	= conversion factor (sec/min)	=	60	sec/min	60	sec/min
10^9	= conversion factor to convert from ng to grams	=	1.0E+09	ng/g	1.0E+09	ng/g
$E_{g/sec}$	= PCDDF Emission rate (g/sec)	=	1.5286E-07	g/sec	1.5391E-07	g/sec

8. PCDDF emission rate (Ton/yr)

$$E_{T/yr} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^9}\right)(Q_{std})(60)\left(\frac{Cap}{2000}\right)$$

Where:

m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
2.205×10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g	2.205E-03	lb/g
Q_{std}	= volumetric flow rate at standard conditions, dry basis (dscfm)	=	85,671	dscfm	85,671	dscfm
60	= conversion factor (min/hr)	=	60	min/hr	60	min/hr
Cap	= capacity factor for process (hours operated/year)	=	8,760	hours/yr	8,760	hours/yr
2000	= conversion factor (lb/Ton)	=	2,000	lb/Ton	2,000	lb/Ton
10^9	= conversion factor to convert from ng to grams	=	1.0E+09	ng/g	1.0E+09	ng/g
$E_{T/yr}$	= PCDDF Emission rate (Ton/yr)	=	5.3146E-06	Ton/yr	5.3510E-06	Ton/yr

9. PCDDF emission rate - Fd-based (lb/MMBtu)

$$E_{Fd} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^9}\right)\left(F_d\right)\left(\frac{20.9}{20.9-O_2}\right)$$

Where:

m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
2.205 x 10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g	2.205E-03	lb/g
F_d	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	9,570	dscf/MMBtu	9,570	dscf/MMBtu
O_2	= proportion of oxygen in the gas stream by volume (%)	=	8.6	%	8.6	%
20.9	= oxygen content of ambient air (%)	=	20.9	%	20.9	%
10^9	= conversion factor to convert from ng to grams	=	1.0E+09	ng/g	1.0E+09	ng/g
E_{Fd}	= PCDDF Emission rate (lb/MMBtu)	=	3.8479E-09	lb/MMBtu	3.8743E-09	lb/MMBtu

10. PCDDF emission rate - Fc-based (lb/MMBtu)

$$E_{Fc} = \left(\frac{m_n}{V_{mstd}}\right)\left(\frac{2.205\times10^{-3}}{10^9}\right)\left(F_c\right)\left(\frac{100}{CO_2}\right)$$

Where:

m_n	= total mass for PCDDs and PCDFs (ng)	=	1.4600E+01	ng	1.4700E+01	ng
V_{mstd}	= volume metered, standard (dscf)	=	136.3785	dscf	136.3785	dscf
2.205 x 10^{-3}	= conversion factor (lb/g)	=	2.205E-03	lb/g	2.205E-03	lb/g
F_c	= ratio of gas volume to heat content of fuel (dscf/MMBtu)	=	1,820	dscf/MMBtu	1,820	dscf/MMBtu
CO_2	= proportion of carbon dioxide in the gas stream by volume (%)	=	10.3	%	10.3	%
100	= conversion factor	=	100		100	
10^9	= conversion factor to convert from ng to grams	=	1.0E+09	ng/g	1.0E+09	ng/g
E_{Fc}	= PCDDF Emission rate (lb/MMBtu)	=	4.1550E-09	lb/MMBtu	4.1834E-09	lb/MMBtu

PLANT DATA

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I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: NC

Date: 5/6/13

CleanAir.

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WHEELABRATOR SOUTH BROWARD
TONS OF REFUSE PROCESSED PER STACK TEST RUN LOG (2013)

UNIT #1						
Date	Test	Method #	Run #	Steam (klb/hr)	Run Length (hr)	Trash Processed (tons)
3/25/2013	HCl	26A	1	185.9	1.00	30.0
3/25/2013	HCl	26A	2	183.2	1.18	34.9
3/25/2013	HCl	26A	3	185.8	1.00	30.0
3/25/2013	Particulate/Metals	5/29	1	186.4	2.23	67.1
3/26/2013	Particulate/Metals	5/29	2	187.2	2.20	66.4
3/26/2013	Particulate/Metals	5/29	3	187.9	2.18	66.1
3/26/2013	Particulate/Metals	29	4	185.9	2.20	66.0
UNIT #2						
Date	Test	Method #	Run #	Steam (klb/hr)	Run Length (hr)	Trash Processed (tons)
3/27/2013	HCl	26A	1	188.8	1.00	30.5
3/27/2013	HCl	26A	2	185.4	1.00	29.9
3/27/2013	HCl	26A	3	188.1	1.00	30.3
3/25/2013	Particulate/Metals	5/29	1	185.9	2.20	66.0
3/25/2013	Particulate/Metals	5/29	2	187.2	2.22	67.0
3/25/2013	Particulate/Metals	5/29	3	187.6	2.22	67.2
3/25/2013	Particulate/Metals	29	4	187.2	2.25	67.9
3/25/2013	Dioxins/Furans	23	2	183.2	4.77	140.8
3/26/2013	Dioxins/Furans	23	3	186.3	4.27	128.2
3/26/2013	Dioxins/Furans	23	4	187.1	4.30	129.7
UNIT #3						
Date	Test	Method #	Run #	Steam (klb/hr)	Run Length (hr)	Trash Processed (tons)
3/26/2013	HCl	26A	1	186.8	1.00	30.1
3/26/2013	HCl	26A	2	187.3	1.00	30.2
3/26/2013	HCl	26A	3	187.0	1.00	30.2
3/26/2013	Particulate/Metals	5/29	1	187.1	2.22	67.0
3/27/2013	Particulate/Metals	5/29	2	187.2	2.22	67.0
3/27/2013	Particulate/Metals	5/29	3	187.2	2.22	67.0
3/27/2013	Particulate/Metals	29	4	186.8	2.20	66.3

Metals: Cd (cadmium) Hg (mercury) Pb (lead)

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 8:00:00
End Time: 9:00:00
TEST 26A run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	493.23	319.82	37.74	21.20	16.54	303.91	5.90	-9.47	185.89	1037.04

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	189.51	900.56	828.13	87.68	-0.10	419.36	1066.43	15.40	5.95	9.36

Lime Slurry 3/25/2013
S.G. **1.100**
Lb/gal **1.045**

Specific Gravity	CaO lb/gal	Lime Conc %
1.100	1.045	21.317

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 9:23:00
End Time: 10:34:00
TEST 26A run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	485.21	319.17	33.10	20.98	12.12	305.69	5.35	-8.52	183.15	737.11

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	187.65	899.86	830.64	80.30	-0.10	414.26	1077.72	9.42	4.98	8.49

Lime Slurry 3/25/2013
S.G. **1.097**
Lb/gal **1.013**

Specific Gravity	CaO lb/gal	Lime Conc %
1.097	1.013	25.783

D - 5

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 10:54:00
End Time: 11:54:00
TEST 26A run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF Δ DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	483.99	320.98	32.45	21.49	10.96	308.25	5.27	-8.43	185.81	639.74

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	190.14	901.82	830.51	80.57	-0.10	410.69	1096.51	8.21	5.18	8.56

Lime Slurry 3/25/2013
S.G. **1.093**
Lb/gal **0.973**

Specific Gravity	CaO lb/gal	Lime Conc %
1.093	0.973	28.208

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 12:26:00
End Time: 14:40:00
TEST 5/29 run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	489.14	322.76	33.25	21.30	11.95	308.04	5.12	-8.34	186.43	681.14

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	190.63	901.84	829.34	81.41	-0.10	410.86	1091.20	7.58	5.31	8.66

Lime Slurry 3/25/2013
S.G. **1.091**
Lb/gal **0.950**

Specific Gravity	CaO lb/gal	Lime Conc %
1.091	0.950	28.665

D - 7

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 7:51:00
End Time: 10:03:00
TEST 5/29 run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	479.42	315.20	30.69	19.37	11.32	298.93	4.66	-7.87	187.15	580.04

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	191.77	896.32	829.44	80.74	-0.10	401.99	1119.35	4.21	5.31	8.28

Lime Slurry 3/26/2013
S.G. **1.082**
Lb/gal **0.854**

Specific Gravity	CaO lb/gal	Lime Conc %
1.082	0.854	35.590

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 10:25:00
End Time: 12:36:00
TEST 5/29 run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	477.26	314.99	29.28	18.33	10.95	299.05	4.35	-7.30	187.85	555.59

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	192.49	898.44	829.27	76.46	-0.10	398.11	1151.68	3.91	4.87	7.75

Lime Slurry 3/26/2013
S.G. **1.081**
Lb/gal **0.846**

Specific Gravity	CaO lb/gal	Lime Conc %
1.081	0.846	37.791

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 12:59:00
End Time: 15:11:00
TEST 29 run 4

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 1	491.99	318.71	34.21	21.21	13.00	301.18	4.70	-7.97	185.88	754.66

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 1	190.15	898.20	829.39	82.86	-0.10	407.18	1100.17	5.71	5.59	8.74

Lime Slurry 3/26/2013
S.G. **1.092**
Lb/gal **0.967**

Specific Gravity	CaO lb/gal	Lime Conc %
1.092	0.967	27.052

Plant Name: SBWD

General Average Report

Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT1

Data Averaging Type: 6m

5/29 Run 1

Time of Report: 03/27/13 15:05

Rolling Average Interval: 1

Date	Time	OPACITY1 (PERCENT)
03/25/13	12:24	0
	12:30	0
	12:36	0
	12:42	0
	12:48	0
	12:54	0
	13:00	0
	13:06	0
	13:12	0
	13:18	0
	13:24	0
	13:30	0
	13:36	0
	13:42	0
	13:48	0
	13:54	0
	14:00	0
	14:06	0
	14:12	0
	14:18	0
	14:24	0
	14:30	0
	14:36	0

Average =	0
Geometric Avg. =	
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
M - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/26/2013 to 03/26/2013

Site Name: UNIT1

Time of Report: 03/27/13 15:06

Data Averaging Type: 6m

5/29 Run 2

Rolling Average Interval: 1

Date	Time	OPACITY1 (PERCENT)
03/26/13	07:48	0
	07:54	0
	08:00	0
	08:06	0
	08:12	0
	08:18	0
	08:24	0
	08:30	0
	08:36	0
	08:42	0
	08:48	0
	08:54	0
	09:00	0
	09:06	0
	09:12	0
	09:18	0
	09:24	0
	09:30	0
	09:36	0
	09:42	0
	09:48	0
	09:54	0
	10:00	0

Average =	0
Geometric Avg. =	
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/26/2013 to 03/26/2013

Site Name: UNIT1
Data Averaging Type: 6m

5/29 RUN 3

Time of Report: 03/27/13 15:07
Rolling Average Interval: 1

Date	Time	OPACITY1 (PERCENT)
03/26/13	10:24	0
	10:30	0
	10:36	0
	10:42	0
	10:48	0
	10:54	0
	11:00	0
	11:06	0
	11:12	0
	11:18	0
	11:24	0
	11:30	0
	11:36	0
	11:42	0
	11:48	0
	11:54	0
	12:00	0
	12:06	0
	12:12	0
	12:18	0
	12:24	0
	12:30	0
	12:36	0

Average =	0
Geometric Avg. =	
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/25/2013 to 03/25/2013

5/29 Run 1

Site Name: UNIT1
Data Averaging Type: 15m

Time of Report: 03/27/13 15:08
Rolling Average Interval: 1

Date	Time	CARFEED1 (LBS/HR)
03/25/13	12:15	7
	12:30	7
	12:45	7
	13:00	7
	13:15	7
	13:30	7
	13:45	7
	14:00	7
	14:15	7
	14:30	7

Average =	7
Geometric Avg. =	7
Maximum =	7
Minimum =	7
Possible Values =	10
Included Values =	10
Total =	70

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

General Average Report

Reporting Period: 03/26/2013 to 03/26/2013

5/29 RUN 2

Site Name: UNIT1

Data Averaging Type: 15m

Time of Report: 03/27/13 15:09

Rolling Average Interval: 1

Date	Time	CARFEED1 (LBS/HR)
03/26/13	07:45	7
	08:00	7
	08:15	7
	08:30	7
	08:45	6
	09:00	5
	09:15	5
	09:30	5
	09:45	5
	10:00	5

Average =	6
Geometric Avg. =	6
Maximum =	7
Minimum =	5
Possible Values =	10
Included Values =	10
Total =	59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
E - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/26/2013 to 03/26/2013
5/29 RUN 3

Site Name: UNIT1
Data Averaging Type: 15m

Time of Report: 03/27/13 15:10
Rolling Average Interval: 1

Date	Time	CARFEED1 (LBS/HR)
03/26/13	10:15	6
	10:30	6
	10:45	6
	11:00	6
	11:15	6
	11:30	6
	11:45	6
	12:00	6
	12:15	6
	12:30	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	58

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/26/2013 to 03/26/2013

29 RUN 4

Site Name: UNIT1
Data Averaging Type: 15m

Time of Report: 03/27/13 15:10
Rolling Average Interval: 1

Date	Time	CARFEED1 (LBS/HR)
03/26/13	12:45	6
	13:00	6
	13:15	6
	13:30	6
	13:45	6
	14:00	6
	14:15	6
	14:30	6
	14:45	6
	15:00	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 7:47:00
End Time: 8:47
TEST 26A run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	489.03	322.07	29.31	18.90	10.4106	300.28	7.18	-10.47	188.79	670.76

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	198.51	889.44	803.96	82.73	-0.10	381.86	1104.89	0.01	5.47	8.14

Lime Slurry 3/27/2013
S.G. **1.102**
Lb/gal **1.074**

Specific Gravity	Cao lb/gal	Lime Conc %
1.102	1.074	27.556

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 9:08:00
End Time: 10:08
TEST 26A run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	492.92	320.46	31.57	22.19	9.3827	299.41	7.36	-10.77	185.44	572.77

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	196.04	888.36	811.54	84.24	-0.10	384.41	1084.82	1.67	5.63	8.46

Lime Slurry 3/27/2013
S.G. **1.097**
Lb/gal **1.017**

Specific Gravity	Cao lb/gal	Lime Conc %
1.097	1.017	27.121

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 10:27:00
End Time: 11:27
TEST 26A run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	508.14	320.78	37.48	25.54	11.9483	303.08	7.93	-11.90	188.06	710.53

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	196.66	889.45	800.00	85.39	-0.10	394.23	1091.00	3.37	6.91	9.32

Lime Slurry 3/27/2013
S.G. **1.095**
Lb/gal **0.991**

Specific Gravity	Cao lb/gal	Lime Conc %
1.095	0.991	23.582

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 7:59:00
End Time: 10:11
TEST 5/29 run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	485.12	319.97	31.50	20.51	10.9924	301.27	7.56	-11.05	185.88	681.21

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	195.61	895.39	805.96	85.96	-0.10	390.82	1089.94	0.01	6.12	8.44

Lime Slurry 3/25/2013
S.G. **1.098**
Lb/gal **1.033**

Specific Gravity	Cao lb/gal	Lime Conc %
1.098	1.033	26.280

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 10:32:00
End Time: 12:45
TEST 5/29 run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	482.13	320.52	29.70	20.43	9.2646	302.22	7.32	-10.65	187.19	539.17

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	195.85	897.70	802.45	84.84	-0.10	387.32	1093.46	0.01	5.95	8.26

Lime Slurry 3/25/2013
S.G. **1.093**
Lb/gal **0.970**

Specific Gravity	Gao lb/gal	Lime Conc %
1.093	0.970	31.471

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 13:04:00
End Time: 15:17
TEST 5/29 run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	"H2O	"H2O	KLBs/hr	lb/hr
Unit 2	482.29	321.74	28.55	19.25	9.3069	303.11	7.36	-10.64	187.58	528.02

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	"H2O	DEG F	DEG F	GPH	%	%
Unit 2	195.29	896.94	793.00	83.11	-0.10	385.79	1089.58	0.01	5.87	8.45

Lime Slurry 3/25/2013
S.G. **1.090**
Lb/gal **0.946**

Specific Gravity	Cao lb/gal	Lime Conc %
1.090	0.946	34.417

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 12:07:00
End Time: 14:22
TEST 29 run 4

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	496.51	319.67	31.86	22.35	9.5051	299.34	7.35	-10.78	187.15	589.93

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	194.59	887.11	787.45	84.59	-0.10	387.26	1091.62	2.68	6.22	8.80

Lime Slurry 3/27/2013
S.G. **1.099**
Lb/gal **1.034**

Specific Gravity	Cao lb/gal	Lime Conc %
1.099	1.034	26.048

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/25/2013
Start Time: 9:47:00
End Time: 14:03
TEST 23 run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	482.13	321.26	29.24	20.09	9.1548	302.66	7.32	-10.64	187.72	534.07

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2'	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	195.74	897.47	798.86	84.30	-0.10	387.06	1096.04	0.01	5.96	8.29

Lime Slurry 3/25/2013
S.G. **1.093**
Lb/gal **0.972**

Specific Gravity	Cap lb/gal	Lime Conc %
1.093	0.972	31.902

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 8:03:00
End Time: 12:49
TEST 23 run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	478.77	317.39	28.86	18.67	10.1870	298.03	7.25	-10.51	183.21	522.00

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	191.69	891.00	811.65	83.22	-0.10	387.50	1069.42	0.01	6.20	8.32

Lime Slurry 3/26/2013
S.G. **1.082**
Lb/gal **0.854**

Specific Gravity	Cao lb/gal	Lime Conc %
1.082	0.854	39.535

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 13:09:00
End Time: 17:25
TEST 23 run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	486.35	318.82	30.37	20.27	10.1017	300.85	7.42	-10.78	186.28	592.86

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	192.54	890.96	786.14	83.39	-0.10	386.33	1089.37	0.01	6.65	9.00

Lime Slurry 3/26/2013
S.G. **1.093**
Lb/gal **0.978**

Specific Gravity	Cao lb/gal	Lime Conc %
1.093	0.978	30.651

D - 27

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 7:21:00
End Time: 11:39
TEST 23 run 4

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 2	495.69	320.83	32.45	21.95	10.4981	300.47	7.51	-11.05	187.07	653.67

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 2	196.85	888.68	804.52	84.09	-0.10	386.14	1091.83	1.44	6.02	8.69

Lime Slurry 3/27/2013
S.G. **1.099**
Lb/gal **1.038**

Specific Gravity	Cao lb/gal	Lime Conc %
1.099	1.038	26.120

Plant Name: SBWD
General Average Report
Reporting Period: 03/25/2013 to 03/25/2013

5|29 RUN 1

Site Name: UNIT2
Data Averaging Type: 6m

Time of Report: 03/27/13 15:12
Rolling Average Interval: 1

Date	Time	OPACITY2 (PERCENT)
03/25/13	07:54	0
	08:00	0
	08:06	0
	08:12	0
	08:18	0
	08:24	0
	08:30	0
	08:36	0
	08:42	0
	08:48	0
	08:54	0
	09:00	0
	09:06	0
	09:12	0
	09:18	0
	09:24	0
	09:30	0
	09:36	0
	09:42	0
	09:48	0
	09:54	0
	10:00	0
	10:06	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT2
Data Averaging Type: 6m

5|29 Run 2

Time of Report: 03/27/13 15:12
Rolling Average Interval: 1

Date	Time	OPACITY2 (PERCENT)
03/25/13	10:30	0
	10:36	0
	10:42	0
	10:48	0
	10:54	0
	11:00	0
	11:06	0
	11:12	0
	11:18	0
	11:24	0
	11:30	0
	11:36	0
	11:42	0
	11:48	0
	11:54	0
	12:00	0
	12:06	0
	12:12	0
	12:18	0
	12:24	0
	12:30	0
	12:36	0
	12:42	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT2

5/29 RUN 3

Time of Report: 03/27/13 15:12

Data Averaging Type: 6m

Rolling Average Interval: 1

Date	Time	OPACITY2 (PERCENT)
03/25/13	13:00	0
	13:06	0
	13:12	0
	13:18	0
	13:24	0
	13:30	0
	13:36	0
	13:42	0
	13:48	0
	13:54	0
	14:00	0
	14:06	0
	14:12	0
	14:18	0
	14:24	0
	14:30	0
	14:36	0
	14:42	0
	14:48	0
	14:54	0
	15:00	0
	15:06	0
	15:12	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT2
Data Averaging Type: 15m

5/29 RUN 1

Time of Report: 03/27/13 15:13
Rolling Average Interval: 1

Date	Time	CARFESD2 (LBS/HR)
03/25/13	07:45	6
	08:00	6
	08:15	6
	08:30	6
	08:45	6
	09:00	6
	09:15	7
	09:30	6
	09:45	6
	10:00	5

Average =	6
Geometric Avg. =	6
Maximum =	7
Minimum =	5
Possible Values =	10
Included Values =	10
Total =	61

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

General Average Report

Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT2

Data Averaging Type: 15m

5/29 Run 2

Time of Report: 03/27/13 15:13

Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/25/13	10:30	7
	10:45	6
	11:00	6
	11:15	7
	11:30	6
	11:45	6
	12:00	6
	12:15	6
	12:30	6
	12:45	7

Average =	6
Geometric Avg. =	6
Maximum =	7
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	63

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/25/2013 to 03/25/2013

Site Name: UNIT2
Data Averaging Type: 15m

5/29 RUN 3

Time of Report: 03/27/13 15:14
Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/25/13	13:00	6
	13:15	7
	13:30	6
	13:45	6
	14:00	6
	14:15	7
	14:30	6
	14:45	6
	15:00	6
	15:15	8

Average =	6
Geometric Avg. =	6
Maximum =	8
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	64

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/27/2013 to 03/27/2013

29 RUN 4

Site Name: UNIT2

Time of Report: 03/27/13 15:14

Data Averaging Type: 15m

Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/27/13	12:00	6
	12:15	6
	12:30	6
	12:45	6
	13:00	6
	13:15	6
	13:30	6
	13:45	6
	14:00	6
	14:15	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/26/2013 to 03/26/2013

Site Name: UNIT2

Data Averaging Type: 15m

D3 Run 2

Time of Report: 03/27/13 15:16

Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/26/13	08:00	6
	08:15	6
	08:30	6
	08:45	6
	09:00	6
	09:15	6
	09:30	7
	09:45	7
	10:00	5
	10:15	6
	10:30	6
	10:45	6
	11:00	6
	11:15	7
	11:30	6
	11:45	6
	12:00	6
	12:15	6
	12:30	6
	12:45	6

Average =	6
Geometric Avg. =	6
Maximum =	7
Minimum =	5
Possible Values =	20
Included Values =	20
Total =	123

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
P - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/26/2013 to 03/26/2013

23 RUN 3

Site Name: UNIT2
Data Averaging Type: 15m

Time of Report: 03/27/13 15:16
Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/26/13	13:00	6
	13:15	6
	13:30	6
	13:45	6
	14:00	6
	14:15	6
	14:30	7
	14:45	7
	15:00	7
	15:15	7
	15:30	6
	15:45	8
	16:00	7
	16:15	5
	16:30	6
	16:45	7
	17:00	6
	17:15	8

Average =	7
Geometric Avg. =	7
Maximum =	8
Minimum =	5
Possible Values =	18
Included Values =	18
Total =	119

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/27/2013 to 03/27/2013

23 RUN 4

Site Name: UNIT2

Time of Report: 03/27/13 15:18

Data Averaging Type: 15m

Rolling Average Interval: 1

Date	Time	CARFEED2 (LBS/HR)
03/27/13	07:15	6
	07:30	6
	07:45	6
	08:00	6
	08:15	6
	08:30	6
	08:45	6
	09:00	6
	09:15	6
	09:30	6
	09:45	6
	10:00	6
	10:15	6
	10:30	6
	10:45	6
	11:00	5
	11:15	6
	11:30	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	5
Possible Values =	18
Included Values =	18
Total =	105

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 8:00:00
End Time: 9:00:00
TEST 26A run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	480.57	315.22	33.76	20.53	13.23	287.46	7.09	-9.93	186.76	669.77

Unit 3

FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
190.11	897.99	819.24	84.00	-0.10	383.87	763.00	1.88	5.90	9.22

Lime Slurry 3/26/2013
S.G. **1.081**
Lb/gal **0.844**

Specific Gravity	CaO lb/gal	Lime Conc %
1.081	0.844	32.885

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 9:21:00
End Time: 10:21:00
TEST 26A run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	485.51	317.53	33.73	20.48	13.25	288.86	6.86	-9.69	187.29	688.94

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 3	190.40	901.58	820.60	82.93	-0.10	388.03	763.02	1.89	6.17	9.10

Lime Slurry 3/26/2013
S.G. **1.083**
Lb/gal **0.867**

Specific Gravity	CaO lb/gal	Lime Conc %
1.083	0.867	32.770

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 10:46:00
End Time: 11:46:00
TEST 26A run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	479.42	314.81	32.05	22.51	9.54	287.47	6.67	-9.53	187.04	477.11

Unit 3	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
	187.63	900.28	802.91	79.83	-0.10	384.51	763.39	1.91	6.15	9.10

Lime Slurry 3/26/2013
S.G. **1.080**
Lb/gal **0.833**

Specific Gravity	CaO lb/gal	Lime Conc %
1.080	0.833	36.089

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/26/2013
Start Time: 12:11:00
End Time: 14:24:00
TEST 5/29 run 1

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	479.49	315.42	32.36	22.00	10.36	286.02	6.93	-9.87	187.06	578.87

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 3	188.27	899.78	803.99	79.32	-0.10	383.20	763.60	1.87	6.10	9.06

Lime Slurry 3/26/2013
S.G. **1.089**
Lb/gal **0.931**

Specific Gravity	CaO lb/gal	Lime Conc %
1.089	0.931	30.675

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 7:28:00
End Time: 9:41:00
TEST 5/29 run 2

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	D INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	492.05	315.86	27.88	15.32	12.55	318.28	7.07	-9.97	187.21	802.91

Unit 3	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
	190.10	900.94	824.02	85.73	-0.10	391.20	765.21	3.74	6.12	9.10

Lime Slurry 3/27/2013
S.G. **1.102**
Lb/gal **1.066**

Specific Gravity	CaO lb/gal	Lime Conc %
1.102	1.066	29.393

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 9:59:00
End Time: 12:11:00
TEST 5/29 run 3

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	491.81	317.68	27.22	14.79	12.43	322.26	7.09	-10.24	187.20	749.16

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 3	188.16	900.77	812.18	85.41	-0.10	391.16	766.60	4.12	6.50	9.43

Lime Slurry 3/27/2013
S.G. **1.096**
Lb/gal **1.005**

Specific Gravity	CaO lb/gal	Lime Conc %
1.096	1.005	32.687

Wheelabrator
SOUTH BROWARD
Emission Test Log

Date: 3/27/2013
Start Time: 12:29:00
End Time: 14:41:00
TEST 29 run 4

	SDA INLET TEMP	SDA OUTLET TEMP	TOTAL SLURRY FL	DIL WATER FLOW	LIME SLURRY	FF OUT TEMP	FF DP	ID INLET PRESS	STEAM FLOW	Lime Feed Rate
	DEG F	DEG F	GPM	GPM	GPM	DEG F	" H2O	" H2O	KLBs/hr	lb/hr
Unit 3	493.81	311.79	29.44	18.70	10.74	317.37	7.22	-10.47	186.81	663.09

	FEED H2O FLOW	SH OUT STM PRESS	FINAL STM TEMP	TOT AIR FLOW	FURNACE DRAFT	ECONO OUT TEMP	SH ROLL AVG	SNCR CHEM FLOW	FURNACE O2	OUTLET O2
	KLBs/hr	DEG F	DEG F	KSCFM	" H2O	DEG F	DEG F	GPH	%	%
Unit 3	186.50	899.68	803.63	86.75	-0.10	392.49	766.56	3.51	6.78	9.73

Lime Slurry 3/27/2013
S.G. **1.098**
Lb/gal **1.029**

Specific Gravity	CaO lb/gal	Lime Conc %
1.098	1.029	28.563

Plant Name: SBWD

General Average Report

Reporting Period: 03/26/2013 to 03/26/2013

Site Name: UNIT3

Data Averaging Type: 6m

5|29 RUN 1

Time of Report: 03/27/13 15:23

Rolling Average Interval: 1

Date	Time	OPACITY3 (PERCENT)
03/26/13	12:06	0
	12:12	0
	12:18	0
	12:24	0
	12:30	0
	12:36	0
	12:42	0
	12:48	0
	12:54	0
	13:00	0
	13:06	0
	13:12	0
	13:18	0
	13:24	0
	13:30	0
	13:36	0
	13:42	0
	13:48	0
	13:54	0
	14:00	0
	14:06	0
	14:12	0
	14:18	0
	14:24	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	24
Included Values =	24
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/27/2013 to 03/27/2013

5/29 RUN2

Site Name: UNIT3
Data Averaging Type: 6m

Time of Report: 03/27/13 15:23
Rolling Average Interval: 1

Date	Time	OPACITY3 (PERCENT)
03/27/13	07:24	0
	07:30	0
	07:36	0
	07:42	0
	07:48	0
	07:54	0
	08:00	0
	08:06	0
	08:12	0
	08:18	0
	08:24	0
	08:30	0
	08:36	0
	08:42	0
	08:48	0
	08:54	0
	09:00	0
	09:06	0
	09:12	0
	09:18	0
	09:24	0
	09:30	0
	09:36	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/27/2013 to 03/27/2013

5/29 RUN 3

Site Name: UNIT3
Data Averaging Type: 6m

Time of Report: 03/27/13 15:24
Rolling Average Interval: 1

Date	Time	OPACITY3 (PERCENT)
03/27/13	09:54	0
	10:00	0
	10:06	0
	10:12	0
	10:18	0
	10:24	0
	10:30	0
	10:36	0
	10:42	0
	10:48	0
	10:54	0
	11:00	0
	11:06	0
	11:12	0
	11:18	0
	11:24	0
	11:30	0
	11:36	0
	11:42	0
	11:48	0
	11:54	0
	12:00	0
	12:06	0

Average =	0
Geometric Avg. =	0
Maximum =	0
Minimum =	0
Possible Values =	23
Included Values =	23
Total =	0

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/26/2013 to 03/26/2013

Site Name: UNIT3
Data Averaging Type: 15m

5|29 RUN1

Time of Report: 03/27/13 15:25
Rolling Average Interval: 1

Date	Time	CARFEED3 (LBS/HR)
03/26/13	12:00	6
	12:15	6
	12:30	6
	12:45	6
	13:00	6
	13:15	6
	13:30	6
	13:45	6
	14:00	6
	14:15	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/27/2013 to 03/27/2013

5|29 RUN2

Site Name: UNIT3
Data Averaging Type: 15m

Time of Report: 03/27/13 15:25
Rolling Average Interval: 1

Date	Time	CARFEED3 (LBS/HR)
03/27/13	07:15	6
	07:30	6
	07:45	6
	08:00	6
	08:15	6
	08:30	6
	08:45	6
	09:00	6
	09:15	6
	09:30	5

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	5
Possible Values =	10
Included Values =	10
Total =	58

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD
General Average Report
Reporting Period: 03/27/2013 to 03/27/2013

Site Name: UNIT3
Data Averaging Type: 15m

5/29 RUN3

Time of Report: 03/27/13 15:25
Rolling Average Interval: 1

Date	Time	CARFEED3 (LBS/HR)
03/27/13	09:45	6
	10:00	6
	10:15	6
	10:30	6
	10:45	6
	11:00	6
	11:15	6
	11:30	6
	11:45	6
	12:00	6

Average =	6
Geometric Avg. =	6
Maximum =	6
Minimum =	6
Possible Values =	10
Included Values =	10
Total =	59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: SBWD

Page: 1

General Average Report

Reporting Period: 03/27/2013 to 03/27/2013

Site Name: UNIT3

29 RUN 4

Time of Report: 03/27/13 15:26

Data Averaging Type: 15m

Rolling Average Interval: 1

Date	Time	CARFEED3 (LBS/HR)
03/27/13	12:15	6
	12:30	6
	12:45	6
	13:00	6
	13:15	6
	13:30	6
	13:45	6
	14:00	6
	14:15	6
	14:30	6
Average =		6
Geometric Avg. =		6
Maximum =		6
Minimum =		6
Possible Values =		10
Included Values =		10
Total =		59

* - excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
I - invalid
S - suspect
H - exceedance
F - stack not operating
B - invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	2	1	Stand By
Time	6:48:00 AM	6:47AM	7:03AM	
Old Zero	164.23	144.26	172.86	
New Zero	165.82	146.32	174.96	
Difference %	3.418%	2.640%	3.494	
Calibration Weight	49.26	49.26	49.26	
Scale Factor Old	4092.5168	4255.0859	4242.6333	
Scale Factor New	4122.6016	4285.1519	4264.1201	
Difference %	0.604%	0.580%	0.416%	

Calibrated by:	S Voigt
Date	3/25/2013 AM

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	2	1	Stand By
Time	6:06:00 PM	5:57PM	5:35PM	
Old Zero	164.35	145.27	174.08	
New Zero	164.65	144.58	171.43	
Difference %	0.323%	-1.118%	-4.409	
Calibration Weight	49.26	49.26	49.26	
Scale Factor Old	4285.1519	4122.6016	4261.1201	
Scale Factor New	4280.2095	4110.6919	4260.9854	
Difference %	-0.095%	-0.238%	-0.060%	

Calibrated by:	S Voigt
Date	3/25/2013 PM

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	2	1	Stand By
Time	6:47AM	6:00AM	6:27AM	
Old Zero	145.00	165.04	171.56	
New Zero	147.24	166.83	174.27	
Difference %	3.738%	2.987%	4.523	
Calibration Weight	49.26	49.26	49.26	
Scale Factor Old	4110.6913	4280.2095	4260.9854	
Scale Factor New	4108.443	4275.2593	4268.8911	
Difference %	-0.095%	-0.094%	0.143%	

Calibrated by: S Voigt

Date 3/26/2013 AM

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	2	1	
Time	4:09PM	6:44PM	5:20PM	7:10PM
Old Zero	147.32	167.02	173.97	151.55
New Zero	144.71	167.24	172.34	146.74
Difference %	-4.341%	0.357%	-2.706%	-8.018%
Calibration Weight	49.26	49.26	49.26	49.26
Scale Factor Old	1408.4443	4275.2998	4268.3911	4128.9507
Scale Factor New	4105.2139	4259.3555	4271.4224	4113.7510
Difference %	-0.065%	-0.306%	0.058%	-0.302%

Calibrated by:	S Voigt
Date	3/26/2013 PM

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	E Use Only	2	1
Time	6:25AM		6:31:00 AM	6:17AM
Old Zero	144.83		172.22	147.29
New Zero	147.60		175.22	147.78
Difference %	4.621%			0.829%
Calibration Weight	49.26		49.26	49.26
Scale Factor Old	4105.2139		4271.4224	4113.7510
Scale Factor New	4113.4839		4289.2168	4124.4561
Difference %	0.165%		0.342%	0.214%

Calibrated by: S Voigt

Date 3/27/2013 AM

Wheelabrator South Broward

Stack Test 2013

Carbon Feeder Calibration

Feeder	A	B	C	D
Boiler #	3	E Use Only	2	1
Time	4:50PM		4:20PM	
Old Zero	147.30		174.50	
New Zero	145.18		172.71	
Difference %	-3.547%		-2.926%	
Calibration Weight	49.26		49.26	
Scale Factor Old	4113.4839		4289.2168	
Scale Factor New	4115.1948		4277.9351	
Difference %	0.034%		-0.216%	

Calibrated by: S Voigt

Date 3/27/2013 PM

WASTE MANAGEMENT

Wheelabrator South Broward, Inc.
4400 State Road 7
Fort Lauderdale, FL, 33314 Ph: (954) 581-6606

Original
Ticket# 248492

Customer Name CHEMICALLIME CHEMICAL LIME
Ticket Date 03/26/2013
Payment Type Credit Account
Manual Ticket#
Route
Hauling Ticket#
Destination
PO#

Carrier LIME CHEMICAL LIME
Tag # LIME1
Container
Truck # LIME1
Check#
Billing# 0000243
Grid

Volume

	Time	Scale	Operator	Inbound		
In	03/26/2013 08:44:28	1	arafeal		Gross	79580 lb
Out	03/26/2013 11:06:52	3	arafeal		Tare	29080 lb
					Net	50500 lb
					Tons	25.25

Comments 109927587

Product		LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	LIME-LIME	100	25.25	Tons	0.00			WSB

Total Tax
Total Ticket

Customer's Signature

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PARAMETERS

E

I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: MK

Date: 5/6/13

CleanAir.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	
Stop Time (approx.)		14:40	10:03	12:36	
Sampling Conditions					
Y_d	Dry gas meter correction factor	1.0039	1.0039	1.0039	
C_p	Pitot tube coefficient	0.8130	0.8130	0.8130	
P_g	Static pressure (in. H_2O)	-8.4000	-7.8000	-7.5000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.90	29.90	**29.8333**
D_n	Nozzle diameter (in.)	0.2760	0.2725	0.2725	
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	**8.1000**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	**10.9300**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.8200	80.9500	81.1400	**80.9700**
V_{lc}	Total Liquid collected (ml)	500.10	395.60	410.10	
V_m	Volume metered, meter conditions (ft^3)	80.0900	67.2070	66.7200	
T_m	Dry gas meter temperature (°F)	89.3400	66.0600	75.4600	
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	**304.9467**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.2448	0.8956	0.8684	
θ	Total sampling time (min)	125.0	125.0	125.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	23.5347	18.6169	19.2993	**20.4836**
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	**70.2761**
P_s	Sample gas pressure, absolute (in. Hg)	29.0824	29.3265	29.3485	**29.2525**
P_v	Vapor pressure, actual (in. Hg)	29.0824	29.3265	29.3485	**29.2525**
B_{wo}	Moisture measured in sample (% by volume)	23.4290	21.5445	22.5943	**22.5226**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	**22.5226**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.6686	0.6148	0.5922	**0.6252**
M_d	MW of sample gas, dry (lb/lb-mole)	30.0788	30.0496	30.0900	**30.0728**
M_s	MW of sample gas, wet (lb/lb-mole)	27.2489	27.4536	27.3583	**27.3536**
V_s	Velocity of sample (ft/sec)	45.8458	41.5664	40.0888	**42.5003**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	**103.2559**
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	**163,201**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	**110,080**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	**85,262**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	81,624	76,981	76,781	**78,462**
Q_a	Volumetric flow rate, actual (acf/hr)	10,562,870	9,576,907	9,236,460	**9,792,079**
Q_s	Volumetric flow rate, standard (scf/hr)	7,027,918	6,505,011	6,281,453	**6,604,794**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,381,346	5,103,538	4,862,203	**5,115,696**
Q_a	Volumetric flow rate, actual (m^3/hr)	299,147	271,224	261,582	**277,317**
Q_s	Volumetric flow rate, standard (m^3/hr)	199,035	184,226	177,894	**187,052**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	152,403	144,535	137,700	**144,880**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	138,698	130,810	130,469	**133,325**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	185,464	171,665	165,765	**174,298**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	142,012	134,681	128,312	**135,001**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	129,241	121,891	121,573	**124,235**

Comments:
Average includes 3 runs.

042213 135258
NNKL

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Emission Parameters for FPM

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 26	Mar 28	
Start Time (approx.)		12:26	07:51	10:25	
Stop Time (approx.)		14:40	10:03	12:36	
Process Conditions					
R_p	Steam Production Rate (Klbs/hr)	186.4	187.2	187.9	**187.1**
P_1	Fabric Filter Inlet Temperature (°F)	323	315	315	**318**
P_2	Carbon Feed Rate - (lbs/hr)	7	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	**8.1000**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	**10.9300**
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	**304.9467**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	**22.5226**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	**163,201**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	**110,080**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	**85,262**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	81,624	76,981	76,781	**78,462**
Q_a	Volumetric flow rate, actual (acf/hr)	10,562,870	9,576,907	9,236,460	**9,792,079**
Q_s	Volumetric flow rate, standard (scf/hr)	7,027,918	6,505,011	6,281,453	**6,604,794**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,381,346	5,103,538	4,862,203	**5,115,696**
Q_a	Volumetric flow rate, actual (m^3/hr)	299,147	271,224	261,582	**277,317**
Q_s	Volumetric flow rate, standard (m^3/hr)	199,035	184,226	177,894	**187,052**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	152,403	144,535	137,700	**144,880**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	138,698	130,810	130,469	**133,325**
Q_a	Volumetric flow rate, normal (Nm^3/hr)	185,464	171,665	165,765	**174,298**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	142,012	134,681	128,312	**135,001**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	129,241	121,891	121,573	**124,235**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	**70.2761**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	**103.2559**
Laboratory Data					
m_{filter}	Matter collected on filter(s) (g)	0.00220	0.00190	0.00190	
m_a	Matter collected in solvent rinse(s) (g)	0.00418	0.00238	0.00164	
m_n	Total filterable particulate matter (g)	0.00638	0.00428	0.00354	
n_{MDL}	Number of non-detectable fractions	N/A	N/A	N/A	
DLC	Detection level classification	ADL	ADL	ADL	
Filterable Particulate Matter Results					
C_{sd}	Particulate Concentration (lb/dscf)	1.8299E-07	1.3931E-07	1.1802E-07	**1.4678E-07**
C_{sd7}	Particulate Concentration @7% O_2 (lb/dscf)	2.0108E-07	1.5393E-07	1.2456E-07	**1.5986E-07**
C_{sd12}	Particulate Concentration @12% CO_2 (lb/dscf)	2.0091E-07	1.5580E-07	1.2725E-07	**1.6132E-07**
C_a	Particulate Concentration (lb/acf)	9.3228E-08	7.4241E-08	6.2128E-08	**7.6532E-08**
C_{sd}	Particulate Concentration (gr/dscf)	0.0013	0.0010	0.0008	**0.0010**
C_{sd7}	Particulate Concentration @7% O_2 (gr/dscf)	0.0014	0.0011	0.0009	**0.0011**
C_{sd12}	Particulate Concentration @12% CO_2 (gr/dscf)	0.0014	0.0011	0.0009	**0.0011**
C_a	Particulate Concentration (gr/acf)	0.0007	0.0005	0.0004	**0.0005**
C_{sd}	Particulate Concentration (mg/dscm)	2.9304	2.2309	1.8899	**2.3504**
C_{sd7}	Particulate Concentration @7% O_2 (mg/dscm)	3.2200	2.4650	1.9947	**2.5599**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/dscm)	3.2173	2.4950	2.0377	**2.5833**
C_a	Particulate Concentration (mg/m^3 (actual,wet))	1.4929	1.1889	0.9949	**1.2256**
C_{sd}	Particulate Concentration (mg/Nm^3 dry)	3.1448	2.3942	2.0282	**2.5224**
C_{sd7}	Particulate Concentration @7% O_2 (mg/Nm^3 dry)	3.4556	2.6454	2.1407	**2.7472**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/Nm^3 dry)	3.4527	2.6775	2.1868	**2.7723**
$E_{lb/hr}$	Particulate Rate (lb/hr)	0.9848	0.7110	0.5738	**0.7565**
$E_{kg/hr}$	Particulate Rate (kg/hr)	0.4466	0.3224	0.2602	**0.3431**
$E_{T/yr}$	Particulate Rate (Ton/yr)	4.3132	3.1142	2.5134	**3.3136**
E_{Fd}	Particulate Rate - F_d-based (lb/MMBtu)	0.0029	0.0022	0.0018	**0.0023**
E_{Fc}	Particulate Rate - F_c-based (lb/MMBtu)	0.0030	0.0024	0.0019	**0.0024**
E_{HI}	Particulate Rate - Heat Input-based (lb/MMBtu)	N/A	N/A	N/A	
E_{Rp}	Particulate Rate - Production-based (lb/Klbs)	0.0053	0.0038	0.0031	**0.0040**
E_{Rp}	Particulate Rate - Production-based (kg/Klbs)	0.0024	0.0017	0.0014	**0.0018**

Comments:

Average includes 3 runs.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	
Stop Time (approx.)		14:40	10:03	12:36	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	186.4	187.2	187.9	**187.1**
P_1	Fabric Filter Inlet Temperature - (°F)	323	315	315	**318**
P_2	Carbon Feed Rate - (lbs/hr)	7	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	**8.1000**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	**10.9300**
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	**304.9467**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	**22.5226**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	**163,201**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	**110,080**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	**85,262**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	**70.2761**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	**103.2559**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	0.2729	<0.2000	<0.2000	
Cadmium Results - Total					
C_{sd}	Concentration (lb/dscf)	7.8233E-12	<6.5049E-12	<6.6700E-12	**<6.9994E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	8.5964E-12	<7.1875E-12	<7.0397E-12	**<7.6078E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	8.5892E-12	<7.2749E-12	<7.1913E-12	**<7.6851E-12**
C_a	Concentration (lb/acf)	3.9856E-12	<3.4665E-12	<3.5112E-12	**<3.6544E-12**
C_{sd}	Concentration (µg/dscm)	1.2528E-01	<1.0417E-01	<1.0681E-01	**<1.1209E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	1.3766E-01	<1.1510E-01	<1.1273E-01	**<1.2183E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	1.3754E-01	<1.1650E-01	<1.1516E-01	**<1.2307E-01**
C_{sd}	Concentration (mg/dscm)	1.2528E-04	<1.0417E-04	<1.0681E-04	**<1.1209E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	1.3766E-04	<1.1510E-04	<1.1273E-04	**<1.2183E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	1.3754E-04	<1.1650E-04	<1.1516E-04	**<1.2307E-04**
C_a	Concentration (µg/m^3 (actual,wet))	6.3825E-02	<5.5511E-02	<5.6226E-02	**<5.8521E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	1.3445E-01	<1.1179E-01	<1.1463E-01	**<1.2029E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	1.4773E-01	<1.2352E-01	<1.2098E-01	**<1.3074E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	1.4761E-01	<1.2502E-01	<1.2359E-01	**<1.3207E-01**
$E_{lb/hr}$	Rate (lb/hr)	4.2100E-05	<3.3198E-05	<3.2431E-05	**<3.5910E-05**
$E_{g/s}$	Rate (g/s)	5.3036E-06	<4.1822E-06	<4.0855E-06	**<4.5238E-06**
$E_{T/yr}$	Rate (Ton/yr)	1.8440E-04	<1.4541E-04	<1.4205E-04	**<1.5728E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	1.2370E-07	<1.0342E-07	<1.0130E-07	**<1.0947E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	1.3027E-07	<1.1034E-07	<1.0907E-07	**<1.1656E-07**

Prepared by Clean Air Engineering Proprietary Software
SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	
Stop Time (approx.)		14:40	10:03	12:36	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	186.4	187.2	187.9	**187.1**
P_1	Fabric Filter Inlet Temperature - (°F)	323	315	315	**318**
P_2	Carbon Feed Rate - (lbs/hr)	7	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	**8.1000**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	**10.9300**
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	**304.9467**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	**22.5226**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	**163,201**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	**110,080**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	**85,262**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	**70.2761**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	**103.2559**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	0.5297	0.2245	<0.2000	
Lead Results - Total					
C_{sd}	Concentration (lb/dscf)	1.5186E-11	7.3019E-12	<6.6700E-12	**<9.7192E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	1.6686E-11	8.0681E-12	<7.0397E-12	**<1.0598E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	1.6672E-11	8.1662E-12	<7.1913E-12	**<1.0677E-11**
C_a	Concentration (lb/acf)	7.7365E-12	3.8912E-12	<3.5112E-12	**<5.0463E-12**
C_{sd}	Concentration (µg/dscm)	2.4318E-01	1.1693E-01	<1.0681E-01	**<1.5564E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	2.6721E-01	1.2920E-01	<1.1273E-01	**<1.6971E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	2.6698E-01	1.3077E-01	<1.1516E-01	**<1.7097E-01**
C_{sd}	Concentration (mg/dscm)	2.4318E-04	1.1693E-04	<1.0681E-04	**<1.5564E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	2.6721E-04	1.2920E-04	<1.1273E-04	**<1.6971E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	2.6698E-04	1.3077E-04	<1.1516E-04	**<1.7097E-04**
C_a	Concentration (µg/m^3 (actual,wet))	1.2389E-01	6.2312E-02	<5.6226E-02	**<8.0809E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	2.6097E-01	1.2549E-01	<1.1463E-01	**<1.6703E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	2.8676E-01	1.3865E-01	<1.2098E-01	**<1.8213E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	2.8652E-01	1.4034E-01	<1.2359E-01	**<1.8348E-01**
$E_{lb/hr}$	Rate (lb/hr)	8.1720E-05	3.7266E-05	<3.2431E-05	**<5.0472E-05**
$E_{g/s}$	Rate (g/s)	1.0295E-05	4.6946E-06	<4.0855E-06	**<6.3583E-06**
$E_{T/yr}$	Rate (Ton/yr)	3.5793E-04	1.6322E-04	<1.4205E-04	**<2.2107E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	2.4011E-07	1.1610E-07	<1.0130E-07	**<1.5250E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	2.5286E-07	1.2385E-07	<1.0907E-07	**<1.6193E-07**

Prepared by Clean Air Engineering Proprietary Software
SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Sampling Conditions						
Y_d	Dry gas meter correction factor	1.0039	1.0039	1.0039	1.0039	
C_p	Pitot tube coefficient	0.8130	0.8130	0.8130	0.8130	
P_g	Static pressure (in. H_2O)	-8.4000	-7.8000	-7.5000	-8.3000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.90	29.90	29.90	**29.8500**
D_n	Nozzle diameter (in.)	0.2760	0.2725	0.2725	0.2725	
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	8.6100	**8.2275**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	10.5900	**10.8450**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.8200	80.9500	81.1400	80.8000	**80.9275**
V_{lc}	Total Liquid collected (ml)	500.10	395.60	410.10	432.10	
V_m	Volume metered, meter conditions (ft^3)	80.0900	67.2070	66.7200	71.3800	
T_m	Dry gas meter temperature (°F)	89.3400	66.0600	75.4600	77.7400	
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	305.0400	**304.9700**
ΔH	Meter box orifice pressure drop (In. H_2O)	1.2448	0.8956	0.8684	0.9896	
θ	Total sampling time (min)	125.0	125.0	125.0	125.0	
Flow Results						
V_{wstd}	Volume of water collected (ft^3)	23.5347	18.6169	19.2993	20.3346	**20.4464**
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	70.4563	**70.3212**
P_s	Sample gas pressure, absolute (In. Hg)	29.0824	29.3265	29.3485	29.2897	**29.2618**
P_v	Vapor pressure, actual (In. Hg)	29.0824	29.3265	29.3485	29.2897	**29.2618**
B_{wo}	Moisture measured in sample (% by volume)	23.4290	21.5445	22.5943	22.3972	**22.4913**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	22.3972	**22.4913**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.6686	0.6148	0.5922	0.6284	**0.6260**
M_d	MW of sample gas, dry (lb/lb-mole)	30.0788	30.0496	30.0900	30.0388	**30.0643**
M_s	MW of sample gas, wet (lb/lb-mole)	27.2489	27.4536	27.3583	27.3424	**27.3508**
V_s	Velocity of sample (ft/sec)	45.8458	41.5664	40.0888	42.6850	**42.5465**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	103.7046	**103.3681**
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	163,910	**163,379**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	110,741	**110,245**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	85,938	**85,431**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	81,624	76,981	76,781	75,984	**77,843**
Q_a	Volumetric flow rate, actual (acf/hr)	10,562,870	9,576,907	9,236,460	9,834,618	**9,802,714**
Q_s	Volumetric flow rate, standard (scf/hr)	7,027,918	6,505,011	6,281,453	6,644,475	**6,614,715**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,381,346	5,103,538	4,862,203	5,156,300	**5,125,847**
Q_a	Volumetric flow rate, actual (m^3/hr)	299,147	271,224	261,582	278,522	**277,619**
Q_s	Volumetric flow rate, standard (m^3/hr)	199,035	184,226	177,894	188,175	**187,333**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	152,403	144,535	137,700	146,029	**145,167**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	138,698	130,810	130,469	129,115	**132,273**
Q_a	Volumetric flow rate, normal (Nm^3/hr)	185,464	171,665	165,765	175,345	**174,560**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	142,012	134,681	128,312	136,073	**135,269**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	129,241	121,891	121,573	120,312	**123,254**

Comments:

Average includes 4 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Process Conditions						
R_P	Steam Production Rate - (Klbs/hour)	186.4	187.2	187.9	185.9	**186.8**
P_1	Fabric Filter Inlet Temperature - (°F)	323	315	315	319	**318**
P_2	Carbon Feed Rate - (lbs/hr)	7	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	8,760	**8,760**
Gas Conditions						
O_2	Oxygen (dry volume %)	8.2500	8.3200	7.7300	8.6100	**8.2275**
CO_2	Carbon dioxide (dry volume %)	10.9300	10.7300	11.1300	10.5900	**10.8450**
T_s	Sample temperature (°F)	311.3600	301.9200	301.5600	305.0400	**304.9700**
B_w	Actual water vapor in gas (% by volume)	23.4290	21.5445	22.5943	22.3972	**22.4913**
Gas Flow Rate						
Q_a	Volumetric flow rate, actual (acfm)	176,048	159,615	153,941	163,910	**163,379**
Q_s	Volumetric flow rate, standard (scfm)	117,132	108,417	104,691	110,741	**110,245**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	89,689	85,059	81,037	85,938	**85,431**
Sampling Data						
V_{mstd}	Volume metered, standard (dscf)	76.9164	67.7946	66.1174	70.4563	**70.3212**
%I	Isokinetic sampling (%)	105.7448	100.8184	103.2045	103.7046	**103.3681**
Laboratory Data						
m_{n-1b}	Fraction 1B (µg)	<0.1000	<0.1000	<0.1000	<0.1000	
m_{n-2b}	Fraction 2B (µg)	<0.8000	<0.8000	<0.7000	<0.7000	
m_{n-3a}	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000	
m_{n-3b}	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000	
m_{n-3c}	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000	
m_n	Total matter corrected for allowable blanks (µg)	<0.8000	<0.8000	<0.7000	<0.7000	
Mercury Results - Total						
C_{sd}	Concentration (lb/dscf)	<2.2934E-11	<2.6020E-11	<2.3345E-11	<2.1907E-11	**<2.3551E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<2.5200E-11	<2.8750E-11	<2.4639E-11	<2.4777E-11	**<2.5842E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<2.5179E-11	<2.9099E-11	<2.5170E-11	<2.4824E-11	**<2.6068E-11**
C_a	Concentration (lb/acf)	<1.1684E-11	<1.3866E-11	<1.2289E-11	<1.1486E-11	**<1.2331E-11**
C_{sd}	Concentration (µg/dscm)	<3.6726E-01	<4.1667E-01	<3.7384E-01	<3.5081E-01	**<3.7714E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<4.0355E-01	<4.6039E-01	<3.9456E-01	<3.9677E-01	**<4.1382E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<4.0321E-01	<4.6599E-01	<4.0306E-01	<3.9752E-01	**<4.1744E-01**
C_{sd}	Concentration (mg/dscm)	<3.6726E-04	<4.1667E-04	<3.7384E-04	<3.5081E-04	**<3.7714E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<4.0355E-04	<4.6039E-04	<3.9456E-04	<3.9677E-04	**<4.1382E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<4.0321E-04	<4.6599E-04	<4.0306E-04	<3.9752E-04	**<4.1744E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.8710E-01	<2.2204E-01	<1.9679E-01	<1.8393E-01	**<1.9747E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<3.9413E-01	<4.4716E-01	<4.0119E-01	<3.7648E-01	**<4.0474E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<4.3307E-01	<4.9408E-01	<4.2343E-01	<4.2580E-01	**<4.4410E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<4.3271E-01	<5.0008E-01	<4.3255E-01	<4.2661E-01	**<4.4799E-01**
$E_{lb/hr}$	Rate (lb/hr)	<1.2342E-04	<1.3279E-04	<1.1351E-04	<1.1296E-04	**<1.2067E-04**
$E_{g/s}$	Rate (g/s)	<1.5547E-05	<1.6729E-05	<1.4299E-05	<1.4230E-05	**<1.5201E-05**
$E_{T/yr}$	Rate (Ton/yr)	<5.4056E-04	<5.8163E-04	<4.9716E-04	<4.9476E-04	**<5.2853E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<3.6262E-07	<4.1370E-07	<3.5454E-07	<3.5653E-07	**<3.7184E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<3.8188E-07	<4.4134E-07	<3.8174E-07	<3.7650E-07	**<3.9537E-07**

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SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Front Half Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Mercury Results - Front Half						
C_{sd}	Concentration (lb/dscf)	<2.8667E-12	<3.2525E-12	<3.3350E-12	<3.1296E-12	**<3.1459E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<3.1500E-12	<3.5937E-12	<3.5198E-12	<3.5396E-12	**<3.4508E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<3.1474E-12	<3.6374E-12	<3.5957E-12	<3.5463E-12	**<3.4817E-12**
C_a	Concentration (lb/acf)	<1.4605E-12	<1.7332E-12	<1.7556E-12	<1.6409E-12	**<1.6475E-12**
C_{sd}	Concentration (µg/dscm)	<4.5907E-02	<5.2084E-02	<5.3405E-02	<5.0116E-02	**<5.0378E-02**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<5.0443E-02	<5.7549E-02	<5.6365E-02	<5.6681E-02	**<5.5260E-02**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<5.0401E-02	<5.8248E-02	<5.7580E-02	<5.6789E-02	**<5.5754E-02**
C_{sd}	Concentration (mg/dscm)	<4.5907E-05	<5.2084E-05	<5.3405E-05	<5.0116E-05	**<5.0378E-05**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<5.0443E-05	<5.7549E-05	<5.6365E-05	<5.6681E-05	**<5.5260E-05**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<5.0401E-05	<5.8248E-05	<5.7580E-05	<5.6789E-05	**<5.5754E-05**
C_a	Concentration (µg/m^3 (actual,wet))	<2.3388E-02	<2.7755E-02	<2.8113E-02	<2.6276E-02	**<2.6383E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<4.9266E-02	<5.5895E-02	<5.7313E-02	<5.3783E-02	**<5.4064E-02**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<5.4134E-02	<6.1760E-02	<6.0489E-02	<6.0829E-02	**<5.9303E-02**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<5.4089E-02	<6.2511E-02	<6.1793E-02	<6.0944E-02	**<5.9834E-02**
$E_{lb/hr}$	Rate (lb/hr)	<1.5427E-05	<1.6599E-05	<1.6215E-05	<1.6137E-05	**<1.6095E-05**
$E_{g/s}$	Rate (g/s)	<1.9434E-06	<2.0911E-06	<2.0427E-06	<2.0329E-06	**<2.0275E-06**
$E_{T/yr}$	Rate (Ton/yr)	<6.7570E-05	<7.2704E-05	<7.1023E-05	<7.0681E-05	**<7.0495E-05**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<4.5327E-08	<5.1712E-08	<5.0648E-08	<5.0932E-08	**<4.9655E-08**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<4.7735E-08	<5.5168E-08	<5.4534E-08	<5.3785E-08	**<5.2806E-08**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 1-3 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Mercury Results - Impingers 1-3 Solution						
C_{sd}	Concentration (lb/dscf)	<2.2934E-11	<2.6020E-11	<2.3345E-11	<2.1907E-11	**<2.3551E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<2.5200E-11	<2.8750E-11	<2.4639E-11	<2.4777E-11	**<2.5842E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<2.5179E-11	<2.9099E-11	<2.5170E-11	<2.4824E-11	**<2.6068E-11**
C_a	Concentration (lb/acf)	<1.1684E-11	<1.3866E-11	<1.2289E-11	<1.1486E-11	**<1.2331E-11**
C_{sd}	Concentration (µg/dscm)	<3.6726E-01	<4.1667E-01	<3.7384E-01	<3.5081E-01	**<3.7714E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<4.0355E-01	<4.6039E-01	<3.9456E-01	<3.9677E-01	**<4.1382E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<4.0321E-01	<4.6599E-01	<4.0306E-01	<3.9752E-01	**<4.1744E-01**
C_{sd}	Concentration (mg/dscm)	<3.6726E-04	<4.1667E-04	<3.7384E-04	<3.5081E-04	**<3.7714E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<4.0355E-04	<4.6039E-04	<3.9456E-04	<3.9677E-04	**<4.1382E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<4.0321E-04	<4.6599E-04	<4.0306E-04	<3.9752E-04	**<4.1744E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.8710E-01	<2.2204E-01	<1.9679E-01	<1.8393E-01	**<1.9747E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<3.9413E-01	<4.4716E-01	<4.0119E-01	<3.7648E-01	**<4.0474E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<4.3307E-01	<4.9408E-01	<4.2343E-01	<4.2580E-01	**<4.4410E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<4.3271E-01	<5.0008E-01	<4.3255E-01	<4.2661E-01	**<4.4799E-01**
$E_{lb/hr}$	Rate (lb/hr)	<1.2342E-04	<1.3279E-04	<1.1351E-04	<1.1296E-04	**<1.2067E-04**
$E_{g/s}$	Rate (g/s)	<1.5547E-05	<1.6729E-05	<1.4299E-05	<1.4230E-05	**<1.5201E-05**
$E_{T/yr}$	Rate (Ton/yr)	<5.4056E-04	<5.8163E-04	<4.9716E-04	<4.9476E-04	**<5.2853E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<3.6262E-07	<4.1370E-07	<3.5454E-07	<3.5653E-07	**<3.7184E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<3.8188E-07	<4.4134E-07	<3.8174E-07	<3.7650E-07	**<3.9537E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 4 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Mercury Results - Impinger 4 Solution						
C_{sd}	Concentration (lb/dscf)	<5.7335E-12	<6.5049E-12	<6.6700E-12	<6.2592E-12	**<6.2919E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<6.3000E-12	<7.1875E-12	<7.0397E-12	<7.0792E-12	**<6.9016E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<6.2948E-12	<7.2749E-12	<7.1913E-12	<7.0926E-12	**<6.9634E-12**
C_a	Concentration (lb/acf)	<2.9210E-12	<3.4665E-12	<3.5112E-12	<3.2817E-12	**<3.2951E-12**
C_{sd}	Concentration (µg/dscm)	<9.1814E-02	<1.0417E-01	<1.0681E-01	<1.0023E-01	**<1.0076E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<1.0089E-01	<1.1510E-01	<1.1273E-01	<1.1336E-01	**<1.1052E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<1.0080E-01	<1.1650E-01	<1.1516E-01	<1.1358E-01	**<1.1151E-01**
C_{sd}	Concentration (mg/dscm)	<9.1814E-05	<1.0417E-04	<1.0681E-04	<1.0023E-04	**<1.0076E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<1.0089E-04	<1.1510E-04	<1.1273E-04	<1.1336E-04	**<1.1052E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<1.0080E-04	<1.1650E-04	<1.1516E-04	<1.1358E-04	**<1.1151E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<4.6775E-02	<5.5511E-02	<5.6226E-02	<5.2552E-02	**<5.2766E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<9.8532E-02	<1.1179E-01	<1.1463E-01	<1.0757E-01	**<1.0813E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<1.0827E-01	<1.2352E-01	<1.2098E-01	<1.2166E-01	**<1.1861E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<1.0818E-01	<1.2502E-01	<1.2359E-01	<1.2189E-01	**<1.1967E-01**
$E_{lb/hr}$	Rate (lb/hr)	<3.0854E-05	<3.3198E-05	<3.2431E-05	<3.2274E-05	**<3.2189E-05**
$E_{g/s}$	Rate (g/s)	<3.8869E-06	<4.1822E-06	<4.0855E-06	<4.0658E-06	**<4.0551E-06**
$E_{T/yr}$	Rate (Ton/yr)	<1.3514E-04	<1.4541E-04	<1.4205E-04	<1.4136E-04	**<1.4099E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<9.0654E-08	<1.0342E-07	<1.0130E-07	<1.0186E-07	**<9.9310E-08**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<9.5471E-08	<1.1034E-07	<1.0907E-07	<1.0757E-07	**<1.0561E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 5-6 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26	
Start Time (approx.)		12:26	07:51	10:25	12:59	
Stop Time (approx.)		14:40	10:03	12:36	15:11	
Mercury Results - Filtered Permanganate Solution						
C_{sd}	Concentration (lb/dscf)	<1.4334E-11	<1.6262E-11	<1.6675E-11	<1.5648E-11	**<1.5730E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<1.5750E-11	<1.7969E-11	<1.7599E-11	<1.7698E-11	**<1.7254E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<1.5737E-11	<1.8187E-11	<1.7978E-11	<1.7731E-11	**<1.7408E-11**
C_a	Concentration (lb/acf)	<7.3025E-12	<8.6662E-12	<8.7779E-12	<8.2043E-12	**<8.2377E-12**
C_{sd}	Concentration (µg/dscm)	<2.2953E-01	<2.6042E-01	<2.6703E-01	<2.5058E-01	**<2.5189E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<2.5222E-01	<2.8774E-01	<2.8183E-01	<2.8341E-01	**<2.7630E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<2.5201E-01	<2.9124E-01	<2.8790E-01	<2.8394E-01	**<2.7877E-01**
C_{sd}	Concentration (mg/dscm)	<2.2953E-04	<2.6042E-04	<2.6703E-04	<2.5058E-04	**<2.5189E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<2.5222E-04	<2.8774E-04	<2.8183E-04	<2.8341E-04	**<2.7630E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<2.5201E-04	<2.9124E-04	<2.8790E-04	<2.8394E-04	**<2.7877E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.1694E-01	<1.3878E-01	<1.4057E-01	<1.3138E-01	**<1.3192E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<2.4633E-01	<2.7947E-01	<2.8656E-01	<2.6892E-01	**<2.7032E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<2.7067E-01	<3.0880E-01	<3.0245E-01	<3.0414E-01	**<2.9652E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<2.7044E-01	<3.1255E-01	<3.0896E-01	<3.0472E-01	**<2.9917E-01**
$E_{lb/hr}$	Rate (lb/hr)	<7.7135E-05	<8.2996E-05	<8.1077E-05	<8.0686E-05	**<8.0473E-05**
$E_{g/s}$	Rate (g/s)	<9.7172E-06	<1.0455E-05	<1.0214E-05	<1.0164E-05	**<1.0138E-05**
$E_{T/yr}$	Rate (Ton/yr)	<3.3785E-04	<3.6352E-04	<3.5512E-04	<3.5340E-04	**<3.5247E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<2.2664E-07	<2.5856E-07	<2.5324E-07	<2.5466E-07	**<2.4827E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<2.3868E-07	<2.7584E-07	<2.7267E-07	<2.6893E-07	**<2.6403E-07**
Mercury Results - HCl Rinse + HCl/MnO2 Precipitate						
C_{sd}	Concentration (lb/dscf)	<1.1467E-11	<1.3010E-11	<1.3340E-11	<1.2518E-11	**<1.2584E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<1.2600E-11	<1.4375E-11	<1.4079E-11	<1.4158E-11	**<1.3803E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<1.2590E-11	<1.4550E-11	<1.4383E-11	<1.4185E-11	**<1.3927E-11**
C_a	Concentration (lb/acf)	<5.8420E-12	<6.9330E-12	<7.0223E-12	<6.5634E-12	**<6.5902E-12**
C_{sd}	Concentration (µg/dscm)	<1.8363E-01	<2.0834E-01	<2.1362E-01	<2.0046E-01	**<2.0151E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<2.0177E-01	<2.3020E-01	<2.2546E-01	<2.2673E-01	**<2.2104E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<2.0160E-01	<2.3299E-01	<2.3032E-01	<2.2716E-01	**<2.2302E-01**
C_{sd}	Concentration (mg/dscm)	<1.8363E-04	<2.0834E-04	<2.1362E-04	<2.0046E-04	**<2.0151E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<2.0177E-04	<2.3020E-04	<2.2546E-04	<2.2673E-04	**<2.2104E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<2.0160E-04	<2.3299E-04	<2.3032E-04	<2.2716E-04	**<2.2302E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<9.3551E-02	<1.1102E-01	<1.1245E-01	<1.0510E-01	**<1.0553E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<1.9706E-01	<2.2358E-01	<2.2925E-01	<2.1513E-01	**<2.1626E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<2.1654E-01	<2.4704E-01	<2.4196E-01	<2.4332E-01	**<2.3721E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<2.1636E-01	<2.5004E-01	<2.4717E-01	<2.4378E-01	**<2.3934E-01**
$E_{lb/hr}$	Rate (lb/hr)	<6.1708E-05	<6.6396E-05	<6.4861E-05	<6.4549E-05	**<6.4379E-05**
$E_{g/s}$	Rate (g/s)	<7.7737E-06	<8.3644E-06	<8.1710E-06	<8.1316E-06	**<8.1102E-06**
$E_{T/yr}$	Rate (Ton/yr)	<2.7028E-04	<2.9082E-04	<2.8409E-04	<2.8272E-04	**<2.8198E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<1.8131E-07	<2.0685E-07	<2.0259E-07	<2.0373E-07	**<1.9862E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<1.9094E-07	<2.2067E-07	<2.1814E-07	<2.1514E-07	**<2.1122E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 SDA Inlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Sampling Conditions					
Y_d	Dry gas meter correction factor	1.0050	1.0050	1.0050	
P_g	Static pressure (in. H_2O)	-1.7000	-1.6000	-1.5000	
A_s	Sample location area (ft^2)	60.1320	60.1320	60.1320	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.70	29.70	**29.7000**
O_2	Oxygen (dry volume %)	7.8750	7.6800	8.0700	**7.8750**
CO_2	Carbon dioxide (dry volume %)	11.1450	11.2500	11.0400	**11.1450**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.9800	81.0700	80.8900	**80.9800**
V_{lc}	Total Liquid collected (ml)	171.30	199.00	187.40	
V_m	Volume metered, meter conditions (ft^3)	35.6900	36.7200	36.8000	
T_m	Dry gas meter temperature (°F)	94.1667	97.2917	100.0000	
T_s	Sample temperature (°F)	502.4167	490.5833	493.2500	**495.4167**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.2000	1.2000	1.2000	
θ	Total sampling time (min)	60.0	60.0	60.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	8.0614	9.3649	8.8190	**8.7485**
V_{mstd}	Volume metered, standard (dscf)	34.0107	34.7960	34.7032	**34.5033**
P_s	Sample gas pressure, absolute (in. Hg)	29.5750	29.5824	29.5897	**29.5824**
P_v	Vapor pressure, actual (in. Hg)	29.5750	29.5824	29.5897	**29.5824**
B_{wo}	Moisture measured in sample (% by volume)	19.1609	21.2064	20.2633	**20.2102**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	19.1609	21.2064	20.2633	**20.2102**
M_d	MW of sample gas, dry (lb/lb-mole)	30.0982	30.1072	30.0892	**30.0982**
M_s	MW of sample gas, wet (lb/lb-mole)	27.7801	27.5397	27.6395	**27.6531**

Comments:

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Average includes 3 runs.
The Run 1 IGS bag did not have enough volume to analyze. An average of Runs 2 and 3 are used for the Run 1 O_2/CO_2.

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 SDA Inlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	185.9	183.2	185.8	**185.0**
P_1	Fabric Filter Inlet Temperature - (°F)	320	319	321	**320**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Gas Conditions					
O_2	Oxygen (dry volume %)	7.8750	7.6800	8.0700	**7.8750**
CO_2	Carbon dioxide (dry volume %)	11.1450	11.2500	11.0400	**11.1450**
T_s	Sample temperature (°F)	502.4167	490.5833	493.2500	**495.4167**
B_w	Actual water vapor in gas (% by volume)	19.1609	21.2064	20.2633	**20.2102**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	34.0107	34.7960	34.7032	**34.5033**
Laboratory Data					
m_n	Total HCl collected (mg)	748.6718	653.1608	636.2724	
Hydrogen Chloride (HCl) Results					
C_{sd}	HCl Concentration (lb/dscf)	4.8538E-05	4.1390E-05	4.0428E-05	**4.3452E-05**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	5.1799E-05	4.3519E-05	4.3800E-05	**4.6373E-05**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	5.2262E-05	4.4150E-05	4.3943E-05	**4.6785E-05**
C_{sd}	HCl Concentration (ppmdv)	513.1759	437.6036	427.4292	**459.4029**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	547.6503	460.1127	463.0761	**490.2797**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	552.5447	466.7772	464.5970	**494.6396**
C_w	HCl Concentration (ppmwv)	414.8469	344.8037	340.8179	**366.8229**
C_{sd}	HCl Concentration (mg/dscm)	777.2731	662.8088	647.3983	**695.8268**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	829.4892	696.9018	701.3902	**742.5938**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	836.9024	706.9961	703.6938	**749.1974**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	834.1468	711.3070	694.7689	**746.7409**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	890.1835	747.8947	752.7115	**796.9299**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	898.1392	758.7275	755.1836	**804.0168**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.7454	0.6262	0.6303	**0.6673**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.7926	0.6696	0.6665	**0.7096**

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SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Sampling Conditions					
Y_d	Dry gas meter correction factor	0.9879	0.9879	0.9879	
P_g	Static pressure (in. H_2O)	-10.0000	-8.3000	-8.4000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.70	29.70	**29.7000**
O_2	Oxygen (dry volume %)	9.2100	7.7600	8.5300	**8.5000**
CO_2	Carbon dioxide (dry volume %)	9.8600	11.2500	10.6400	**10.5833**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.9300	80.9900	80.8300	**80.9167**
V_{lc}	Total Liquid collected (ml)	254.70	279.40	255.60	
V_m	Volume metered, meter conditions (ft^3)	40.9100	41.1800	41.5600	
T_m	Dry gas meter temperature (°F)	78.7500	81.2917	86.1667	
T_s	Sample temperature (°F)	302.0833	303.1667	305.7500	**303.6667**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.5000	1.5000	1.5000	
θ	Total sampling time (min)	60.0	60.0	60.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	11.9862	13.1486	12.0285	**12.3878**
V_{mstd}	Volume metered, standard (dscf)	39.4475	39.5214	39.5301	**39.4997**
P_s	Sample gas pressure, absolute (in. Hg)	28.9647	29.0897	29.0824	**29.0456**
P_v	Vapor pressure, actual (in. Hg)	28.9647	29.0897	29.0824	**29.0456**
B_{wo}	Moisture measured in sample (% by volume)	23.3041	24.9640	23.3298	**23.8660**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	23.3041	24.9640	23.3298	**23.8660**
M_d	MW of sample gas, dry (lb/lb-mole)	29.9460	30.1104	30.0436	**30.0333**
M_s	MW of sample gas, wet (lb/lb-mole)	27.1621	27.0872	27.2339	**27.1610**

Comments:
Average includes 3 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	185.9	183.2	185.8	**185.0**
P_1	Fabric Filter Inlet Temperature - (°F)	320	319	321	**320**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.2100	7.7600	8.5300	**8.5000**
CO_2	Carbon dioxide (dry volume %)	9.8600	11.2500	10.6400	**10.5833**
T_s	Sample temperature (°F)	302.0833	303.1667	305.7500	**303.6667**
B_w	Actual water vapor in gas (% by volume)	23.3041	24.9640	23.3298	**23.8660**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	39.4475	39.5214	39.5301	**39.4997**
Laboratory Data					
m_n	Total HCl collected (mg)	0.8900	0.8859	2.9409	
Hydrogen Chloride (HCl) Results					
C_{sd}	HCl Concentration (lb/dscf)	4.9748E-08	4.9428E-08	1.6404E-07	**8.7740E-08**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	5.9153E-08	5.2287E-08	1.8433E-07	**9.8592E-08**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	6.0546E-08	5.2723E-08	1.8501E-07	**9.9427E-08**
C_{sd}	HCl Concentration (ppmdv)	0.5260	0.5226	1.7344	**0.9276**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	0.6254	0.5528	1.9489	**1.0424**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	0.6401	0.5574	1.9561	**1.0512**
C_w	HCl Concentration (ppmwv)	0.4034	0.3921	1.3297	**0.7084**
C_{sd}	HCl Concentration (mg/dscm)	0.7967	0.7915	2.6269	**1.4050**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	0.9473	0.8373	2.9519	**1.5788**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	0.9696	0.8443	2.9627	**1.5922**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	0.8549	0.8494	2.8192	**1.5078**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	1.0166	0.8986	3.1678	**1.6943**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	1.0405	0.9061	3.1795	**1.7087**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.0009	0.0008	0.0027	**0.0014**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.0009	0.0008	0.0028	**0.0015**

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (CI)

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		07:59	10:32	13:04	
Stop Time (approx.)		10:11	12:45	15:17	
Sampling Conditions					
Y_d	Dry gas meter correction factor	0.9906	0.9906	0.9906	
C_p	Pitot tube coefficient	0.8240	0.8240	0.8240	
P_g	Static pressure (in. H_2O)	-12.2000	-11.6000	-11.7000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.70	29.70	**29.7000**
D_n	Nozzle diameter (in.)	0.2725	0.2725	0.2725	
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	**8.5000**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	**10.5800**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	81.0900	80.9100	80.7600	**80.9200**
V_{lc}	Total Liquid collected (ml)	436.70	407.60	396.90	
V_m	Volume metered, meter conditions (ft^3)	70.8450	69.8500	69.4350	
T_m	Dry gas meter temperature (°F)	81.8600	86.5400	84.1600	
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	**299.5733**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.0368	1.0120	0.9948	
θ	Total sampling time (min)	125.0	125.0	125.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	20.5511	19.1817	18.6781	**19.4703**
V_{mstd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	**66.9693**
P_s	Sample gas pressure, absolute (in. Hg)	28.8029	28.8471	28.8397	**28.8299**
P_v	Vapor pressure, actual (in. Hg)	28.8029	28.8471	28.8397	**28.8299**
B_{wo}	Moisture measured in sample (% by volume)	23.2008	22.3886	21.9578	**22.5157**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	**22.5157**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.6220	0.6161	0.6118	**0.6166**
M_d	MW of sample gas, dry (lb/lb-mole)	29.9984	30.0512	30.0488	**30.0328**
M_s	MW of sample gas, wet (lb/lb-mole)	27.2147	27.3531	27.4031	**27.3236**
V_s	Velocity of sample (ft/sec)	43.1163	42.5665	42.2817	**42.6548**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	**99.6552**
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	**163,795**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	**109,710**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	**85,003**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,600	76,749	75,144	**75,831**
Q_a	Volumetric flow rate, actual (acf/hr)	9,934,004	9,807,332	9,741,696	**9,827,677**
Q_s	Volumetric flow rate, standard (scf/hr)	6,652,956	6,576,795	6,518,063	**6,582,605**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,109,416	5,104,342	5,086,839	**5,100,199**
Q_a	Volumetric flow rate, actual (m^3/hr)	281,337	277,749	275,891	**278,326**
Q_s	Volumetric flow rate, standard (m^3/hr)	188,416	186,259	184,595	**186,423**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	144,702	144,558	144,062	**144,441**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,462	130,414	127,687	**128,854**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	175,569	173,559	172,009	**173,713**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	134,836	134,702	134,240	**134,592**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,703	121,522	118,981	**120,069**

Comments:

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Average includes 4 runs. * indicates that the run is not included in the average.

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Emission Parameters for FPM

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		07:59	10:32	13:04	
Stop Time (approx.)		10:11	12:45	15:17	
Process Conditions					
R_p	Steam Production Rate (Klbs/hr)	185.9	187.2	187.6	**186.9**
P_1	Fabroc Filter Inlet Temperature (°F)	320	321	322	**321**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	**8.5000**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	**10.5800**
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	**299.5733**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	**22.5157**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	**163,795**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	**109,710**
Q_{sd}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	**85,003**
Q_{sd7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,600	76,749	75,144	**75,831**
Q_a	Volumetric flow rate, actual (acf/hr)	9,934,004	9,807,332	9,741,696	**9,827,677**
Q_s	Volumetric flow rate, standard (scf/hr)	6,652,956	6,576,795	6,518,063	**6,582,605**
Q_{sd}	Volumetric flow rate, dry standard (dscf/hr)	5,109,416	5,104,342	5,086,839	**5,100,199**
Q_a	Volumetric flow rate, actual (m^3/hr)	281,337	277,749	275,891	**278,326**
Q_s	Volumetric flow rate, standard (m^3/hr)	188,416	186,259	184,595	**186,423**
Q_{sd}	Volumetric flow rate, dry standard (dry m^3/hr)	144,702	144,558	144,062	**144,441**
Q_{sd7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,462	130,414	127,687	**128,854**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	175,569	173,559	172,009	**173,713**
Q_{sd}	Volumetric flow rate, dry normal (Nm^3/hr)	134,836	134,702	134,240	**134,592**
Q_{sd7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,703	121,522	118,981	**120,069**
Sampling Data					
V_{msd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	**66.9693**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	**99.6552**
Laboratory Data					
m_{filter}	Matter collected on filter(s) (g)	0.00480	0.00440	0.00530	
m_s	Matter collected in solvent rinse(s) (g)	0.00679	0.00466	0.00377	
m_n	Total filterable particulate matter (g)	0.01159	0.00906	0.00907	
n_{MDL}	Number of non-detectable fractions	N/A	N/A	N/A	
DLC	Detection level classification	ADL	ADL	ADL	
Filterable Particulate Matter Results					
C_{sd}	Particulate Concentration (lb/dscf)	3.7581E-07	3.0029E-07	3.0133E-07	**3.2581E-07**
C_{sd7}	Particulate Concentration @7% O_2 (lb/dscf)	4.2332E-07	3.3286E-07	3.3998E-07	**3.6539E-07**
C_{sd12}	Particulate Concentration @12% CO_2 (lb/dscf)	4.3572E-07	3.3583E-07	3.3921E-07	**3.7026E-07**
C_a	Particulate Concentration (lb/acf)	1.9329E-07	1.5629E-07	1.5735E-07	**1.6898E-07**
C_{sd}	Particulate Concentration (gr/dscf)	0.0026	0.0021	0.0021	**0.0023**
C_{sd7}	Particulate Concentration @7% O_2 (gr/dscf)	0.0030	0.0023	0.0024	**0.0026**
C_{sd12}	Particulate Concentration @12% CO_2 (gr/dscf)	0.0030	0.0024	0.0024	**0.0026**
C_a	Particulate Concentration (gr/acf)	0.0014	0.0011	0.0011	**0.0012**
C_{sd}	Particulate Concentration (mg/dscm)	6.0181	4.8087	4.8255	**5.2174**
C_{sd7}	Particulate Concentration @7% O_2 (mg/dscm)	6.7789	5.3302	5.4443	**5.8511**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/dscm)	6.9775	5.3779	5.4320	**5.9291**
C_a	Particulate Concentration (mg/m^3 (actual,wet))	3.0953	2.5027	2.5197	**2.7059**
C_{sd}	Particulate Concentration (mg/Nm^3 dry)	6.4584	5.1606	5.1785	**5.5992**
C_{sd7}	Particulate Concentration @7% O_2 (mg/Nm^3 dry)	7.2749	5.7202	5.8427	**6.2793**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/Nm^3 dry)	7.4880	5.7714	5.8295	**6.3630**
$E_{lb/hr}$	Particulate Rate (lb/hr)	1.9202	1.5328	1.5328	**1.6619**
$E_{kg/hr}$	Particulate Rate (kg/hr)	0.8708	0.6951	0.6952	**0.7537**
$E_{T/yr}$	Particulate Rate (Ton/yr)	8.4104	6.7136	8.7138	**7.2793**
E_{Fd}	Particulate Rate - F_d-based (lb/MMBtu)	0.0061	0.0048	0.0049	**0.0053**
E_{Fc}	Particulate Rate - F_c-based (lb/MMBtu)	0.0066	0.0051	0.0051	**0.0056**
E_{HI}	Particulate Rate - Heat Input-based (lb/MMBtu)	N/A	N/A	N/A	
E_{Rp}	Particulate Rate - Production-based (lb/Klbs)	0.0103	0.0082	0.0082	**0.0089**
E_{Rp}	Particulate Rate - Production-based (kg/Klbs)	0.0047	0.0037	0.0037	**0.0040**

Comments:

Average includes 3 runs.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		07:59	10:32	13:04	
Stop Time (approx.)		10:11	12:45	15:17	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	185.9	187.2	187.6	**186.9**
P_1	Fabric Filter Inlet Temperature - (°F)	320	321	322	**321**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	**8.5000**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	**10.5800**
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	**299.5733**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	**22.5157**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	**163,795**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	**109,710**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	**85,003**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	**66.9693**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	**99.6552**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	2.0285	2.0936	1.7367	
Cadmium Results - Total					
C_{sd}	Concentration (lb/dscf)	6.5751E-11	6.9425E-11	5.7684E-11	**6.4287E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	7.4063E-11	7.6954E-11	6.5082E-11	**7.2033E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	7.6233E-11	7.7642E-11	6.4935E-11	**7.2937E-11**
C_a	Concentration (lb/acf)	3.3818E-11	3.6133E-11	3.0121E-11	**3.3357E-11**
C_{sd}	Concentration (µg/dscm)	1.0529E+00	1.1117E+00	9.2373E-01	**1.0295E+00**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	1.1860E+00	1.2323E+00	1.0422E+00	**1.1535E+00**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	1.2208E+00	1.2433E+00	1.0398E+00	**1.1680E+00**
C_{sd}	Concentration (mg/dscm)	1.0529E-03	1.1117E-03	9.2373E-04	**1.0295E-03**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	1.1860E-03	1.2323E-03	1.0422E-03	**1.1535E-03**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	1.2208E-03	1.2433E-03	1.0398E-03	**1.1680E-03**
C_a	Concentration (µg/m^3 (actual,wet))	5.4155E-01	5.7862E-01	4.8235E-01	**5.3417E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	1.1300E+00	1.1931E+00	9.9132E-01	**1.1048E+00**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	1.2728E+00	1.3225E+00	1.1185E+00	**1.2379E+00**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	1.3101E+00	1.3343E+00	1.1159E+00	**1.2534E+00**
$E_{lb/hr}$	Rate (lb/hr)	3.3595E-04	3.5437E-04	2.9343E-04	**3.2792E-04**
$E_{g/s}$	Rate (g/s)	4.2322E-05	4.4642E-05	3.6965E-05	**4.1310E-05**
$E_{T/yr}$	Rate (Ton/yr)	1.4715E-03	1.5521E-03	1.2852E-03	**1.4363E-03**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	1.0657E-06	1.1073E-06	9.3649E-07	**1.0365E-06**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	1.1562E-06	1.1776E-06	9.8485E-07	**1.1062E-06**

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SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		07:59	10:32	13:04	
Stop Time (approx.)		10:11	12:45	15:17	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	185.9	187.2	187.6	**186.9**
P_1	Fabric Filter Inlet Temperature - (°F)	320	321	322	**321**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	**8.5000**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	**10.5800**
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	**299.5733**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	**22.5157**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	**163,795**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	**109,710**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	**85,003**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	**66.9693**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	**99.6552**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	11.2882	16.0733	18.8891	
Lead Results - Total					
C_{sd}	Concentration (lb/dscf)	3.6589E-10	5.3300E-10	6.2740E-10	**5.0876E-10**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	4.1214E-10	5.9081E-10	7.0786E-10	**5.7027E-10**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	4.2421E-10	5.9609E-10	7.0627E-10	**5.7552E-10**
C_a	Concentration (lb/acf)	1.8819E-10	2.7741E-10	3.2761E-10	**2.6440E-10**
C_{sd}	Concentration (µg/dscm)	5.8591E+00	8.5353E+00	1.0047E+01	**8.1471E+00**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	6.5998E+00	9.4610E+00	1.1335E+01	**9.1321E+00**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	6.7932E+00	9.5455E+00	1.1310E+01	**9.2162E+00**
C_{sd}	Concentration (mg/dscm)	5.8591E-03	8.5353E-03	1.0047E-02	**8.1471E-03**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	6.5998E-03	9.4610E-03	1.1335E-02	**9.1321E-03**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	6.7932E-03	9.5455E-03	1.1310E-02	**9.2162E-03**
C_a	Concentration (µg/m^3 (actual,wet))	3.0136E+00	4.4423E+00	5.2462E+00	**4.2340E+00**
C_{sd}	Concentration (µg/Nm^3 dry)	6.2879E+00	9.1598E+00	1.0782E+01	**8.7433E+00**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	7.0828E+00	1.0153E+01	1.2165E+01	**9.8003E+00**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	7.2903E+00	1.0244E+01	1.2137E+01	**9.8906E+00**
$E_{lb/hr}$	Rate (lb/hr)	1.8695E-03	2.7206E-03	3.1915E-03	**2.5939E-03**
$E_{g/s}$	Rate (g/s)	2.3551E-04	3.4273E-04	4.0205E-04	**3.2676E-04**
$E_{T/yr}$	Rate (Ton/yr)	8.1882E-03	1.1916E-02	1.3979E-02	**1.1361E-02**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	5.9305E-06	8.5014E-06	1.0186E-05	**8.2059E-06**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	6.4339E-06	9.0407E-06	1.0712E-05	**8.7288E-06**

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SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Sampling Conditions						
Y_d	Dry gas meter correction factor	0.9906	0.9906	0.9906	0.9972	
C_p	Pitot tube coefficient	0.8240	0.8240	0.8240	0.8250	
P_g	Static pressure (in. H_2O)	-12.2000	-11.6000	-11.7000	-12.1000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.70	29.70	29.70	30.10	**29.8000**
D_n	Nozzle diameter (in.)	0.2725	0.2725	0.2725	0.2725	
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	9.3900	**8.7225**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	10.0200	**10.4400**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	81.0900	80.9100	80.7600	80.5900	**80.8375**
V_{lc}	Total Liquid collected (ml)	436.70	407.60	396.90	378.00	
V_m	Volume metered, meter conditions (ft^3)	70.8450	69.8500	69.4350	69.7900	
T_m	Dry gas meter temperature (°F)	81.8600	86.5400	84.1600	69.5200	
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	298.9600	**299.4200**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.0368	1.0120	0.9948	1.0624	
θ	Total sampling time (min)	125.0	125.0	125.0	125.0	
Flow Results						
V_{wstd}	Volume of water collected (ft^3)	20.5511	19.1817	18.6781	17.7887	**19.0499**
V_{mstd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	69.9655	**67.7184**
P_s	Sample gas pressure, absolute (in. Hg)	28.8029	28.8471	28.8397	29.2103	**28.9250**
P_v	Vapor pressure, actual (in. Hg)	28.8029	28.8471	28.8397	29.2103	**28.9250**
B_{wo}	Moisture measured in sample (% by volume)	23.2008	22.3886	21.9578	20.2710	**21.9546**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	20.2710	**21.9546**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.6220	0.6161	0.6118	0.6179	**0.6170**
M_d	MW of sample gas, dry (lb/lb-mole)	29.9984	30.0512	30.0488	29.9788	**30.0193**
M_s	MW of sample gas, wet (lb/lb-mole)	27.2147	27.3531	27.4031	27.5506	**27.3804**
V_s	Velocity of sample (ft/sec)	43.1163	42.5665	42.2817	42.3228	**42.5718**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	100.5628	**99.8821**
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	162,520	**163,476**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	110,381	**109,878**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	88,006	**85,754**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,600	76,749	75,144	72,874	**75,092**
Q_a	Volumetric flow rate, actual (acf/hr)	9,934,004	9,807,332	9,741,696	9,751,183	**9,808,554**
Q_s	Volumetric flow rate, standard (scf/hr)	6,652,956	6,576,795	6,518,063	6,622,877	**6,592,673**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,109,416	5,104,342	5,086,839	5,280,351	**5,145,237**
Q_a	Volumetric flow rate, actual (m^3/hr)	281,337	277,749	275,891	276,159	**277,784**
Q_s	Volumetric flow rate, standard (m^3/hr)	188,416	186,259	184,595	187,564	**186,708**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	144,702	144,558	144,062	149,543	**145,716**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,462	130,414	127,687	123,830	**127,598**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	175,569	173,559	172,009	174,775	**173,978**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	134,836	134,702	134,240	139,347	**135,781**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,703	121,522	118,981	115,387	**118,898**

Comments:
Average includes 4 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Process Conditions						
R_P	Steam Production Rate - (Klbs/hour)	185.9	187.2	187.6	187.2	**187.0**
P_1	Fabric Filter Inlet Temperature - (°F)	320	321	322	320	**320**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	8,760	**8,760**
Gas Conditions						
O_2	Oxygen (dry volume %)	8.5600	8.3600	8.5800	9.3900	**8.7225**
CO_2	Carbon dioxide (dry volume %)	10.3500	10.7300	10.6600	10.0200	**10.4400**
T_s	Sample temperature (°F)	298.9600	299.1200	300.6400	298.9600	**299.4200**
B_w	Actual water vapor in gas (% by volume)	23.2008	22.3886	21.9578	20.2710	**21.9546**
Gas Flow Rate						
Q_a	Volumetric flow rate, actual (acfm)	165,567	163,456	162,362	162,520	**163,476**
Q_s	Volumetric flow rate, standard (scfm)	110,883	109,613	108,634	110,381	**109,878**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,157	85,072	84,781	88,006	**85,754**
Sampling Data						
V_{mstd}	Volume metered, standard (dscf)	68.0282	66.4943	66.3855	69.9655	**67.7184**
%I	Isokinetic sampling (%)	101.0494	98.8692	99.0471	100.5628	**99.8821**
Laboratory Data						
$m_{n\text{-}1b}$	Fraction 1B (µg)	<0.1000	<0.1000	<0.1000	<0.1000	
$m_{n\text{-}2b}$	Fraction 2B (µg)	0.8805	1.0329	1.0367	1.1187	
$m_{n\text{-}3a}$	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000	
$m_{n\text{-}3b}$	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000	
$m_{n\text{-}3c}$	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000	
m_n	Total matter corrected for allowable blanks (µg)	0.8805	1.0329	1.0367	1.1187	
Mercury Results - Total						
C_{sd}	Concentration (lb/dscf)	2.8540E-11	3.4251E-11	3.4435E-11	3.5257E-11	**3.3121E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	3.2148E-11	3.7965E-11	3.8852E-11	4.2578E-11	**3.7886E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	3.3090E-11	3.8304E-11	3.8764E-11	4.2224E-11	**3.8096E-11**
C_a	Concentration (lb/acf)	1.4679E-11	1.7826E-11	1.7981E-11	1.9092E-11	**1.7395E-11**
C_{sd}	Concentration (µg/dscm)	4.5703E-01	5.4848E-01	5.5144E-01	5.6460E-01	**5.3039E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	5.1481E-01	6.0796E-01	6.2216E-01	6.8183E-01	**6.0669E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	5.2989E-01	6.1339E-01	6.2075E-01	6.7616E-01	**6.1005E-01**
C_{sd}	Concentration (mg/dscm)	4.5703E-04	5.4848E-04	5.5144E-04	5.6460E-04	**5.3039E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	5.1481E-04	6.0796E-04	6.2216E-04	6.8183E-04	**6.0669E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	5.2989E-04	6.1339E-04	6.2075E-04	6.7616E-04	**6.1005E-04**
C_a	Concentration (µg/m^3 (actual,wet))	2.3507E-01	2.8546E-01	2.8794E-01	3.0573E-01	**2.7855E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	4.9048E-01	5.8861E-01	5.9178E-01	6.0591E-01	**5.6919E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	5.5248E-01	6.5244E-01	6.6768E-01	7.3172E-01	**6.5108E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	5.6867E-01	6.5828E-01	6.6617E-01	7.2564E-01	**6.5469E-01**
$E_{lb/hr}$	Rate (lb/hr)	1.4582E-04	1.7483E-04	1.7517E-04	1.8617E-04	**1.7050E-04**
$E_{g/s}$	Rate (g/s)	1.8370E-05	2.2024E-05	2.2067E-05	2.3453E-05	**2.1479E-05**
$E_{T/yr}$	Rate (Ton/yr)	6.3871E-04	7.6574E-04	7.6723E-04	8.1543E-04	**7.4678E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	4.6260E-07	5.4630E-07	5.5905E-07	6.1268E-07	**5.4516E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	5.0187E-07	5.8095E-07	5.8792E-07	6.4040E-07	**5.7779E-07**

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SS Metals-1 Version 2008-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Front Half Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Mercury Results - Front Half						
C_{sd}	Concentration (lb/dscf)	<3.2413E-12	<3.3161E-12	<3.3215E-12	<3.1516E-12	**<3.2576E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<3.6511E-12	<3.6757E-12	<3.7475E-12	<3.8060E-12	**<3.7201E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<3.7580E-12	<3.7086E-12	<3.7390E-12	<3.7743E-12	**<3.7450E-12**
C_a	Concentration (lb/acf)	<1.6671E-12	<1.7259E-12	<1.7344E-12	<1.7066E-12	**<1.7085E-12**
C_{sd}	Concentration (µg/dscm)	<5.1905E-02	<5.3102E-02	<5.3189E-02	<5.0468E-02	**<5.2166E-02**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<5.8467E-02	<5.8861E-02	<6.0011E-02	<6.0947E-02	**<5.9571E-02**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<6.0180E-02	<5.9387E-02	<5.9875E-02	<6.0440E-02	**<5.9971E-02**
C_{sd}	Concentration (mg/dscm)	<5.1905E-05	<5.3102E-05	<5.3189E-05	<5.0468E-05	**<5.2166E-05**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<5.8467E-05	<5.8861E-05	<6.0011E-05	<6.0947E-05	**<5.9571E-05**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<6.0180E-05	<5.9387E-05	<5.9875E-05	<6.0440E-05	**<5.9971E-05**
C_a	Concentration (µg/m^3 (actual,wet))	<2.6697E-02	<2.7638E-02	<2.7774E-02	<2.7329E-02	**<2.7359E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<5.5703E-02	<5.6988E-02	<5.7081E-02	<5.4161E-02	**<5.5983E-02**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<6.2745E-02	<6.3168E-02	<6.4402E-02	<6.5407E-02	**<6.3930E-02**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<6.4583E-02	<6.3733E-02	<6.4257E-02	<6.4863E-02	**<6.4359E-02**
$E_{lb/hr}$	Rate (lb/hr)	<1.6561E-05	<1.6926E-05	<1.6896E-05	<1.6641E-05	**<1.6756E-05**
$E_{g/s}$	Rate (g/s)	<2.0863E-06	<2.1323E-06	<2.1285E-06	<2.0964E-06	**<2.1109E-06**
$E_{T/yr}$	Rate (Ton/yr)	<7.2538E-05	<7.4138E-05	<7.4004E-05	<7.2889E-05	**<7.3392E-05**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<5.2537E-08	<5.2891E-08	<5.3924E-08	<5.4766E-08	**<5.3529E-08**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<5.6997E-08	<5.6247E-08	<5.6709E-08	<5.7244E-08	**<5.6799E-08**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 1-3 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Mercury Results - Impingers 1-3 Solution						
C_{sd}	Concentration (lb/dscf)	2.8540E-11	3.4251E-11	3.4435E-11	3.5257E-11	**3.3121E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	3.2148E-11	3.7965E-11	3.8852E-11	4.2578E-11	**3.7886E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	3.3090E-11	3.8304E-11	3.8764E-11	4.2224E-11	**3.8096E-11**
C_a	Concentration (lb/acf)	1.4679E-11	1.7826E-11	1.7981E-11	1.9092E-11	**1.7395E-11**
C_{sd}	Concentration (µg/dscm)	4.5703E-01	5.4848E-01	5.5144E-01	5.6460E-01	**5.3039E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	5.1481E-01	6.0796E-01	6.2216E-01	6.8183E-01	**6.0669E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	5.2989E-01	6.1339E-01	6.2075E-01	6.7616E-01	**6.1005E-01**
C_{sd}	Concentration (mg/dscm)	4.5703E-04	5.4848E-04	5.5144E-04	5.6460E-04	**5.3039E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	5.1481E-04	6.0796E-04	6.2216E-04	6.8183E-04	**6.0669E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	5.2989E-04	6.1339E-04	6.2075E-04	6.7616E-04	**6.1005E-04**
C_a	Concentration (µg/m^3 (actual,wet))	2.3507E-01	2.8546E-01	2.8794E-01	3.0573E-01	**2.7855E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	4.9048E-01	5.8861E-01	5.9178E-01	6.0591E-01	**5.6919E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	5.5248E-01	6.5244E-01	6.6768E-01	7.3172E-01	**6.5108E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	5.6867E-01	6.5828E-01	6.6617E-01	7.2564E-01	**6.5469E-01**
$E_{lb/hr}$	Rate (lb/hr)	1.4582E-04	1.7483E-04	1.7517E-04	1.8617E-04	**1.7050E-04**
$E_{g/s}$	Rate (g/s)	1.8370E-05	2.2024E-05	2.2067E-05	2.3453E-05	**2.1479E-05**
$E_{T/yr}$	Rate (Ton/yr)	6.3871E-04	7.6574E-04	7.6723E-04	8.1543E-04	**7.4678E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	4.6260E-07	5.4630E-07	5.5905E-07	6.1268E-07	**5.4516E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	5.0187E-07	5.8095E-07	5.8792E-07	6.4040E-07	**5.7779E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 4 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Mercury Results - Impinger 4 Solution						
C_{sd}	Concentration (lb/dscf)	<6.4826E-12	<6.6321E-12	<6.6430E-12	<6.3031E-12	**<6.5152E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<7.3021E-12	<7.3514E-12	<7.4950E-12	<7.6119E-12	**<7.4401E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<7.5161E-12	<7.4171E-12	<7.4781E-12	<7.5486E-12	**<7.4900E-12**
C_a	Concentration (lb/acf)	<3.3342E-12	<3.4518E-12	<3.4688E-12	<3.4132E-12	**<3.4170E-12**
C_{sd}	Concentration (µg/dscm)	<1.0381E-01	<1.0620E-01	<1.0638E-01	<1.0094E-01	**<1.0433E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<1.1693E-01	<1.1772E-01	<1.2002E-01	<1.2189E-01	**<1.1914E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<1.2036E-01	<1.1877E-01	<1.1975E-01	<1.2088E-01	**<1.1994E-01**
C_{sd}	Concentration (mg/dscm)	<1.0381E-04	<1.0620E-04	<1.0638E-04	<1.0094E-04	**<1.0433E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<1.1693E-04	<1.1772E-04	<1.2002E-04	<1.2189E-04	**<1.1914E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<1.2036E-04	<1.1877E-04	<1.1975E-04	<1.2088E-04	**<1.1994E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<5.3393E-02	<5.5275E-02	<5.5548E-02	<5.4657E-02	**<5.4718E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<1.1141E-01	<1.1398E-01	<1.1416E-01	<1.0832E-01	**<1.1197E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<1.2549E-01	<1.2634E-01	<1.2880E-01	<1.3081E-01	**<1.2786E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<1.2917E-01	<1.2747E-01	<1.2851E-01	<1.2973E-01	**<1.2872E-01**
$E_{lb/hr}$	Rate (lb/hr)	<3.3122E-05	<3.3853E-05	<3.3792E-05	<3.3283E-05	**<3.3512E-05**
$E_{g/s}$	Rate (g/s)	<4.1726E-06	<4.2646E-06	<4.2570E-06	<4.1928E-06	**<4.2218E-06**
$E_{T/yr}$	Rate (Ton/yr)	<1.4508E-04	<1.4828E-04	<1.4801E-04	<1.4578E-04	**<1.4678E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<1.0507E-07	<1.0578E-07	<1.0785E-07	<1.0953E-07	**<1.0706E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<1.1399E-07	<1.1249E-07	<1.1342E-07	<1.1449E-07	**<1.1360E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 5-6 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Mercury Results - Filtered Permanganate Solution						
C_{sd}	Concentration (lb/dscf)	<1.6207E-11	<1.6580E-11	<1.6608E-11	<1.5758E-11	**<1.6288E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<1.8255E-11	<1.8379E-11	<1.8737E-11	<1.9030E-11	**<1.8600E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<1.8790E-11	<1.8543E-11	<1.8695E-11	<1.8872E-11	**<1.8725E-11**
C_a	Concentration (lb/acf)	<8.3356E-12	<8.6294E-12	<8.6720E-12	<8.5330E-12	**<8.5425E-12**
C_{sd}	Concentration (µg/dscm)	<2.5952E-01	<2.6551E-01	<2.6595E-01	<2.5234E-01	**<2.6083E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<2.9233E-01	<2.9431E-01	<3.0005E-01	<3.0474E-01	**<2.9786E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<3.0090E-01	<2.9694E-01	<2.9938E-01	<3.0220E-01	**<2.9985E-01**
C_{sd}	Concentration (mg/dscm)	<2.5952E-04	<2.6551E-04	<2.6595E-04	<2.5234E-04	**<2.6083E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<2.9233E-04	<2.9431E-04	<3.0005E-04	<3.0474E-04	**<2.9786E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<3.0090E-04	<2.9694E-04	<2.9938E-04	<3.0220E-04	**<2.9985E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.3348E-01	<1.3819E-01	<1.3887E-01	<1.3664E-01	**<1.3680E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<2.7851E-01	<2.8494E-01	<2.8541E-01	<2.7080E-01	**<2.7992E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<3.1372E-01	<3.1584E-01	<3.2201E-01	<3.2703E-01	**<3.1965E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<3.2292E-01	<3.1866E-01	<3.2128E-01	<3.2431E-01	**<3.2179E-01**
$E_{lb/hr}$	Rate (lb/hr)	<8.2806E-05	<8.4632E-05	<8.4480E-05	<8.3207E-05	**<8.3781E-05**
$E_{g/s}$	Rate (g/s)	<1.0432E-05	<1.0662E-05	<1.0642E-05	<1.0482E-05	**<1.0554E-05**
$E_{T/yr}$	Rate (Ton/yr)	<3.6269E-04	<3.7069E-04	<3.7002E-04	<3.6444E-04	**<3.6696E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<2.6268E-07	<2.6446E-07	<2.6962E-07	<2.7383E-07	**<2.6765E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<2.8498E-07	<2.8123E-07	<2.8354E-07	<2.8622E-07	**<2.8399E-07**
Mercury Results - HCl Rinse + HCl/MnO2 Precipitate						
C_{sd}	Concentration (lb/dscf)	<1.2965E-11	<1.3264E-11	<1.3286E-11	<1.2606E-11	**<1.3030E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<1.4604E-11	<1.4703E-11	<1.4990E-11	<1.5224E-11	**<1.4880E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<1.5032E-11	<1.4834E-11	<1.4956E-11	<1.5097E-11	**<1.4980E-11**
C_a	Concentration (lb/acf)	<6.6685E-12	<6.9036E-12	<6.9376E-12	<6.8264E-12	**<6.8340E-12**
C_{sd}	Concentration (µg/dscm)	<2.0762E-01	<2.1241E-01	<2.1276E-01	<2.0187E-01	**<2.0866E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<2.3387E-01	<2.3545E-01	<2.4004E-01	<2.4379E-01	**<2.3829E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<2.4072E-01	<2.3755E-01	<2.3950E-01	<2.4176E-01	**<2.3988E-01**
C_{sd}	Concentration (mg/dscm)	<2.0762E-04	<2.1241E-04	<2.1276E-04	<2.0187E-04	**<2.0866E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<2.3387E-04	<2.3545E-04	<2.4004E-04	<2.4379E-04	**<2.3829E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<2.4072E-04	<2.3755E-04	<2.3950E-04	<2.4176E-04	**<2.3988E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.0679E-01	<1.1055E-01	<1.1110E-01	<1.0931E-01	**<1.0944E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<2.2281E-01	<2.2795E-01	<2.2832E-01	<2.1664E-01	**<2.2393E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<2.5098E-01	<2.5267E-01	<2.5761E-01	<2.6163E-01	**<2.5572E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<2.5833E-01	<2.5493E-01	<2.5703E-01	<2.5945E-01	**<2.5744E-01**
$E_{lb/hr}$	Rate (lb/hr)	<6.6245E-05	<6.7705E-05	<6.7584E-05	<6.6565E-05	**<6.7025E-05**
$E_{g/s}$	Rate (g/s)	<8.3453E-06	<8.5293E-06	<8.5140E-06	<8.3856E-06	**<8.4435E-06**
$E_{T/yr}$	Rate (Ton/yr)	<2.9015E-04	<2.9655E-04	<2.9602E-04	<2.9156E-04	**<2.9357E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<2.1015E-07	<2.1157E-07	<2.1570E-07	<2.1906E-07	**<2.1412E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<2.2799E-07	<2.2499E-07	<2.2683E-07	<2.2898E-07	**<2.2720E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 23 (PCDD/F)
Sampling, Velocity and Moisture Parameters

Run No.		2	3	4	Average
Date (2013)		Mar 26	Mar 26	Mar 27	
Start Time (approx.)		08:03	13:09	07:21	
Stop Time (approx.)		12:49	17:25	11:39	
Sampling Conditions					
Y_d	Dry gas meter correction factor	0.9972	0.9972	0.9972	
C_p	Pitot tube coefficient	0.8250	0.8250	0.8250	
P_g	Static pressure (in. H_2O)	-10.4000	-11.0000	-11.2000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.90	29.90	30.10	**29.9667**
D_n	Nozzle diameter (in.)	0.2722	0.2722	0.2722	
O_2	Oxygen (dry volume %)	8.6300	9.4800	9.1200	**9.0767**
CO_2	Carbon dioxide (dry volume %)	10.3400	9.8000	10.1300	**10.0900**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	81.0300	80.7200	80.7500	**80.8333**
V_{lc}	Total Liquid collected (ml)	768.40	718.60	774.40	
V_m	Volume metered, meter conditions (ft^3)	135.7050	139.9550	139.9160	
T_m	Dry gas meter temperature (°F)	64.6600	74.5200	61.3400	
T_s	Sample temperature (°F)	295.7200	298.2400	295.7200	**296.5600**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.0088	1.0508	1.0768	
θ	Total sampling time (min)	250.0	250.0	250.0	
Flow Results					
V_{watd}	Volume of water collected (ft^3)	36.1609	33.8173	36.4433	**35.4738**
V_{mstd}	Volume metered, standard (dscf)	136.3785	138.0694	142.4737	**138.9738**
P_s	Sample gas pressure, absolute (in. Hg)	29.1353	29.0912	29.2765	**29.1676**
P_v	Vapor pressure, actual (in. Hg)	29.1353	29.0912	29.2765	**29.1676**
B_{wo}	Moisture measured in sample (% by volume)	20.9581	19.6742	20.3688	**20.3337**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	20.9581	19.6742	20.3688	**20.3337**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.6055	0.6130	0.6238	**0.6141**
M_d	MW of sample gas, dry (lb/lb-mole)	29.9996	29.9472	29.9856	**29.9775**
M_s	MW of sample gas, wet (lb/lb-mole)	27.4847	27.5967	27.5443	**27.5419**
V_s	Velocity of sample (ft/sec)	41.4872	42.0175	42.5899	**42.0315**
%I	Isokinetic sampling (%)	100.9030	99.7346	101.4319	**100.6899**
Q_a	Volumetric flow rate, actual (acfm)	159,311	161,347	163,545	**161,401**
Q_s	Volumetric flow rate, standard (scfm)	108,387	109,242	111,807	**109,812**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,671	87,749	89,033	**87,484**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,625	72,093	75,454	**74,391**
Q_a	Volumetric flow rate, actual (acf/hr)	9,558,645	9,680,827	9,812,722	**9,684,064**
Q_s	Volumetric flow rate, standard (scf/hr)	6,503,201	6,554,497	6,708,410	**6,588,703**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,140,256	5,264,953	5,341,986	**5,249,065**
Q_a	Volumetric flow rate, actual (m^3/hr)	270,706	274,167	277,902	**274,258**
Q_s	Volumetric flow rate, standard (m^3/hr)	184,174	185,627	189,986	**186,596**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	145,575	149,107	151,288	**148,657**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,504	122,503	128,214	**126,407**
Q_a	Volumetric flow rate, normal (Nm^3/hr)	171,617	172,971	177,033	**173,873**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	135,650	138,940	140,973	**138,521**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,742	114,151	119,472	**117,788**

Comments:

Average includes 3 runs.

Run 1 raw data was taken on an electronic data sheet. The dat awas mistakenly overwritten therefor does not exist.

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 23 (PCDD/F) Parameters (NDs & EMPCs counted as Zero)
Total Tetra- through Octa-PCDD/F Results (using USEPA/INTL 2005 TEFs)

Run No.		2	3	4	Average
Date (2013)		Mar 26	Mar 26	Mar 27	
Start Time (approx.)		08:03	13:09	07:21	
Stop Time (approx.)		12:49	17:25	11:39	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	183.2	186.3	187.1	185.5
P_1	Fabric Filter Inlet Temperature - (°F)	317	319	321	319
P_2	Carbon Feed Rate - (lbs/hr)	6	7	6	6
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	9,570
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	1,820
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	8,760
Gas Conditions					
O_2	Oxygen (dry volume %)	8.6300	9.4800	9.1200	9.0767
CO_2	Carbon dioxide (dry volume %)	10.3400	9.8000	10.1300	10.0900
T_s	Sample temperature (°F)	295.7	298.2	295.7	296.6
B_w	Actual water vapor in gas (% by volume)	20.9581	19.6742	20.3688	20.3337
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	159,311	161,347	163,545	161,401
Q_s	Volumetric flow rate, standard (scfm)	108,387	109,242	111,807	109,812
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,671	87,749	89,033	87,484
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,625	72,093	75,454	74,391
Q_a	Volumetric flow rate, actual (acf/hr)	9,558,645	9,680,827	9,812,722	9,684,064
Q_s	Volumetric flow rate, standard (scf/hr)	6,503,201	6,554,497	6,708,410	6,588,703
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,140,256	5,264,953	5,341,986	5,249,065
Q_a	Volumetric flow rate, actual (m^3/hr)	270,706	274,167	277,902	274,258
Q_s	Volumetric flow rate, standard (m^3/hr)	184,174	185,627	189,986	186,596
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	145,575	149,107	151,288	148,657
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,504	122,503	128,214	126,407
Q_s	Volumetric flow rate, normal (Nm^3/hr)	171,617	172,971	177,033	173,873
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	135,650	138,940	140,973	138,521
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,742	114,151	119,472	117,788
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	136.3785	138.0694	142.4737	138.9738
%I	Isokinetic sampling (%)	100.9030	99.7346	101.4319	100.6899
Laboratory Data from USEPA Method 23 (PCDD/F)					
	Total PCDDs (ng)	12.33600	12.85500	13.90700	
	Total PCDFs (ng)	2.26200	2.26050	2.39250	
m_n	Total PCDDs & PCDFs (ng)	14.60000	15.10000	16.30000	
m_{n_TEQ}	Total TEQ PCDDs & PCDFs (ng)	0.10000	0.11700	0.12300	
Total PCDD/F Results (TEF=1)					
C_{sd}	PCDD/F Concentration (ng/dscm)	3.7801E+00	3.8617E+00	4.0397E+00	3.8938E+00
C_{sd7}	PCDD/F Concentration @7% O_2 (ng/dscm)	4.2823E+00	4.7003E+00	4.7667E+00	4.5831E+00
C_{sd12}	PCDD/F Concentration @12% CO_2 (ng/dscm)	4.3870E+00	4.7286E+00	4.7854E+00	4.6337E+00
C_{sd}	PCDD/F Concentration (ng/Nm^3 dry)	4.0567E+00	4.1443E+00	4.3353E+00	4.1788E+00
C_{sd7}	PCDD/F Concentration @7% O_2 (ng/Nm^3 dry)	4.5956E+00	5.0442E+00	5.1155E+00	4.9185E+00
C_{sd12}	PCDD/F Concentration @12% CO_2 (ng/Nm^3 dry)	4.7080E+00	5.0746E+00	5.1356E+00	4.9727E+00
$E_{lb/hr}$	PCDD/F Rate (lb/hr)	1.2134E-06	1.2696E-06	1.3476E-06	1.2769E-06
$E_{g/s}$	PCDD/F Rate (g/s)	1.5286E-07	1.5995E-07	1.6977E-07	1.6086E-07
$E_{T/yr}$	PCDD/F Rate (Ton/yr)	5.3146E-06	5.5611E-06	5.9025E-06	5.5927E-06
E_{Fd}	PCDD/F Rate - F_d-based (lb/MMBtu)	3.8479E-09	4.2236E-09	4.2833E-09	4.1183E-09
E_{Fc}	PCDD/F Rate - F_c-based (lb/MMBtu)	4.1550E-09	4.4785E-09	4.5324E-09	4.3886E-09
Total PCDD/F TEQ Results (using USEPA/INTL 2005 TEFs)					
C_{sdTEQ}	TEQ Concentration (ng/dscm)	2.5891E-02	2.9922E-02	3.0484E-02	2.8766E-02
C_{sd7TEQ}	TEQ Concentration @7% O_2 (ng/dscm)	2.9331E-02	3.6420E-02	3.5970E-02	3.3907E-02
$C_{sd12TEQ}$	TEQ Concentration @12% CO_2 (ng/dscm)	3.0048E-02	3.6639E-02	3.6111E-02	3.4266E-02
C_{sdTEQ}	TEQ Concentration (ng/Nm^3 dry)	2.7786E-02	3.2111E-02	3.2714E-02	3.0870E-02
C_{sd7TEQ}	TEQ Concentration @7% O_2 (ng/Nm^3 dry)	3.1477E-02	3.9084E-02	3.8602E-02	3.6388E-02
$C_{sd12TEQ}$	TEQ Concentration @12% CO_2 (ng/Nm^3 dry)	3.2246E-02	3.9320E-02	3.8753E-02	3.6773E-02
$E_{lb/hrTEQ}$	TEQ Rate (lb/hr)	8.3109E-09	9.8377E-09	1.0169E-08	9.4392E-09
$E_{g/sTEQ}$	TEQ Rate (g/sec)	1.0470E-09	1.2393E-09	1.2811E-09	1.1891E-09
$E_{T/yrTEQ}$	TEQ Rate (Ton/yr)	3.6402E-08	4.3089E-08	4.4541E-08	4.1344E-08
E_{FdTEQ}	TEQ Rate - F_d-based (lb/MMBtu)	2.6356E-11	3.2726E-11	3.2322E-11	3.0468E-11
E_{FcTEQ}	TEQ Rate - F_c-based (lb/MMBtu)	2.8459E-11	3.4701E-11	3.4201E-11	3.2454E-11

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Wheelabrator South Broward, Inc. **Max**
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 23 (PCDD/F) Maximum Emissions Parameters (NDs & EMPCs included)
Total Tetra- through Octa-PCDD/F Results (TEQ based on USEPA/INTL 2005 TEFs)

Run No.		2	3	4	Average
Date (2013)		Mar 26	Mar 26	Mar 27	
Start Time (approx.)		08:03	13:09	07:21	
Stop Time (approx.)		12:49	17:25	11:39	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	183.2	186.3	187.1	**185.5**
P_1	Fabric Filter Inlet Temperature - (°F)	317	319	321	**319**
P_2	Carbon Feed Rate - (lbs/hr)	6	7	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.6300	9.4800	9.1200	**9.0767**
CO_2	Carbon dioxide (dry volume %)	10.3400	9.8000	10.1300	**10.0900**
T_s	Sample temperature (°F)	295.7	298.2	295.7	**296.6**
B_w	Actual water vapor in gas (% by volume)	20.9581	19.6742	20.3688	**20.3337**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	159,311	161,347	163,545	**161,401**
Q_s	Volumetric flow rate, standard (scfm)	108,387	109,242	111,807	**109,812**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	85,671	87,749	89,033	**87,484**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	75,625	72,093	75,454	**74,391**
Q_a	Volumetric flow rate, actual (acf/hr)	9,558,645	9,680,827	9,812,722	**9,684,064**
Q_s	Volumetric flow rate, standard (scf/hr)	6,503,201	6,554,497	6,708,410	**6,588,703**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,140,256	5,264,953	5,341,986	**5,249,065**
Q_a	Volumetric flow rate, actual (m^3/hr)	270,706	274,167	277,902	**274,258**
Q_s	Volumetric flow rate, standard (m^3/hr)	184,174	185,627	189,986	**186,596**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	145,575	149,107	151,288	**148,657**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	128,504	122,503	128,214	**126,407**
Q_a	Volumetric flow rate, normal (Nm^3/hr)	171,617	172,971	177,033	**173,873**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	135,650	138,940	140,973	**138,521**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	119,742	114,151	119,472	**117,788**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	136.3785	138.0694	142.4737	**138.9738**
%I	Isokinetic sampling (%)	100.9030	99.7346	101.4319	**100.6899**
Laboratory Data from USEPA Method 23 (PCDD/F), including NDs and EMPCs					
m_n	Total PCDDs & PCDFs (ng)	14.70000	15.10000	16.30000	
m_{n_TEQ}	Total TEQ PCDDs & PCDFs (ng)	0.11200	0.11700	0.12300	
Total PCDD/F Results (TEF=1)					
C_{pd}	PCDD/F Concentration (ng/dscm)	3.8060E+00	3.8617E+00	4.0397E+00	**3.9025E+00**
C_{pd7}	PCDD/F Concentration @7% O_2 (ng/dscm)	4.3116E+00	4.7003E+00	4.7667E+00	**4.5929E+00**
C_{pd12}	PCDD/F Concentration @12% CO_2 (ng/dscm)	4.4170E+00	4.7286E+00	4.7854E+00	**4.6437E+00**
C_{pd}	PCDD/F Concentration (ng/Nm^3 dry)	4.0845E+00	4.1443E+00	4.3353E+00	**4.1880E+00**
C_{pd7}	PCDD/F Concentration @7% O_2 (ng/Nm^3 dry)	4.6271E+00	5.0442E+00	5.1155E+00	**4.9289E+00**
C_{pd12}	PCDD/F Concentration @12% CO_2 (ng/Nm^3 dry)	4.7402E+00	5.0746E+00	5.1356E+00	**4.9835E+00**
$E_{lb/hr}$	PCDD/F Rate (lb/hr)	1.2217E-06	1.2696E-06	1.3476E-06	**1.2797E-06**
$E_{g/s}$	PCDD/F Rate (g/s)	1.5391E-07	1.5995E-07	1.6977E-07	**1.6121E-07**
$E_{T/yr}$	PCDD/F Rate (Ton/yr)	5.3510E-06	5.5611E-06	5.9025E-06	**5.6049E-06**
E_{Fd}	PCDD/F - F_d-based (lb/MMBtu)	3.8743E-09	4.2236E-09	4.2833E-09	**4.1270E-09**
E_{Fc}	PCDD/F Rate - F_c-based (lb/MMBtu)	4.1834E-09	4.4785E-09	4.5324E-09	**4.3981E-09**
Total PCDD/F TEQ Results (using USEPA/INTL 2005 TEFs)					
C_{pdTEQ}	TEQ Concentration (ng/dscm)	2.8998E-02	2.9922E-02	3.0484E-02	**2.9801E-02**
C_{pd7TEQ}	TEQ Concentration @7% O_2 (ng/dscm)	3.2850E-02	3.6420E-02	3.5970E-02	**3.5080E-02**
$C_{pd12TEQ}$	TEQ Concentration @12% CO_2 (ng/dscm)	3.3654E-02	3.6639E-02	3.6111E-02	**3.5468E-02**
C_{pdTEQ}	TEQ Concentration (ng/Nm^3 dry)	3.1120E-02	3.2111E-02	3.2714E-02	**3.1982E-02**
C_{pd7TEQ}	TEQ Concentration @7% O_2 (ng/Nm^3 dry)	3.5254E-02	3.9084E-02	3.8602E-02	**3.7647E-02**
$C_{pd12TEQ}$	TEQ Concentration @12% CO_2 (ng/Nm^3 dry)	3.6116E-02	3.9320E-02	3.8753E-02	**3.8063E-02**
$E_{lb/hrTEQ}$	TEQ Rate (lb/hr)	9.3082E-09	9.8377E-09	1.0169E-08	**9.7716E-09**
$E_{g/sTEQ}$	TEQ Rate (g/sec)	1.1726E-09	1.2393E-09	1.2811E-09	**1.2310E-09**
$E_{T/yrTEQ}$	TEQ Rate (Ton/yr)	4.0770E-08	4.3089E-08	4.4541E-08	**4.2800E-08**
E_{FdTEQ}	TEQ Rate - F_d-based (lb/MMBtu)	2.9518E-11	3.2726E-11	3.2322E-11	**3.1522E-11**
E_{FcTEQ}	TEQ Rate - F_c-based (lb/MMBtu)	3.1874E-11	3.4701E-11	3.4201E-11	**3.3592E-11**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 SDA Inlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	Average
Date (2013)		Mar 27	Mar 27	
Start Time (approx.)		07:47	09:08	
Stop Time (approx.)		08:47	10:08	
Sampling Conditions				
Y_d	Dry gas meter correction factor	1.0050	1.0050	
P_g	Static pressure (in. H_2O)	-1.5000	-1.4000	
A_s	Sample location area (ft^2)	60.1320	60.1320	
P_{bar}	Barometric pressure (in. Hg)	30.10	30.10	**30.1000**
O_2	Oxygen (dry volume %)	8.2300	8.3800	**8.3050**
CO_2	Carbon dioxide (dry volume %)	11.0400	10.9800	**11.0100**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.7300	80.6400	**80.6850**
V_{lc}	Total Liquid collected (ml)	165.50	148.40	
V_m	Volume metered, meter conditions (ft^3)	35.8600	36.1500	
T_m	Dry gas meter temperature (°F)	68.5000	82.2917	
T_s	Sample temperature (°F)	491.3333	496.0833	**493.7083**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.2000	1.2000	
θ	Total sampling time (min)	60.0	60.0	
Flow Results				
V_{wstd}	Volume of water collected (ft^3)	7.7884	6.9837	**7.3861**
V_{mstd}	Volume metered, standard (dscf)	36.3135	35.6761	**35.9948**
P_s	Sample gas pressure, absolute (in. Hg)	29.9897	29.9971	**29.9934**
P_v	Vapor pressure, actual (in. Hg)	29.9897	29.9971	**29.9934**
B_{wo}	Moisture measured in sample (% by volume)	17.6601	16.3707	**17.0154**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	17.6601	16.3707	**17.0154**
M_d	MW of sample gas, dry (lb/lb-mole)	30.0956	30.0920	**30.0938**
M_s	MW of sample gas, wet (lb/lb-mole)	27.9595	28.1125	**28.0360**

Comments:

Average includes 2 runs. An impinger in the Run 3 train broke mid run which compromsed the sample.

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 SDA Inlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	Average
Date (2013)		Mar 27	Mar 27	
Start Time (approx.)		07:47	09:08	
Stop Time (approx.)		08:47	10:08	
Process Conditions				
R_P	Steam Production Rate - (Klbs/hour)	188.8	185.4	**187.1**
P_1	Fabric Filter Inlet Temperature - (°F)	322	320	**321**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	**1,820**
Gas Conditions				
O_2	Oxygen (dry volume %)	8.2300	8.3800	**8.3050**
CO_2	Carbon dioxide (dry volume %)	11.0400	10.9800	**11.0100**
T_s	Sample temperature (°F)	491.3333	496.0833	**493.7083**
B_w	Actual water vapor in gas (% by volume)	17.6601	16.3707	**17.0154**
Sampling Data				
V_{mstd}	Volume metered, standard (dscf)	36.3135	35.6761	**35.9948**
Laboratory Data				
m_n	Total HCl collected (mg)	819.8351	747.6850	
Hydrogen Chloride (HCl) Results				
C_{sd}	HCl Concentration (lb/dscf)	4.9781E-05	4.6211E-05	**4.7996E-05**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	5.4614E-05	5.1305E-05	**5.2960E-05**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	5.4110E-05	5.0504E-05	**5.2307E-05**
C_{sd}	HCl Concentration (ppmdv)	526.3192	488.5750	**507.4471**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	577.4141	542.4275	**559.9208**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	572.0861	533.9618	**553.0239**
C_w	HCl Concentration (ppmwv)	433.3708	408.5920	**420.9814**
C_{sd}	HCl Concentration (mg/dscm)	797.1803	740.0118	**768.5961**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	874.5704	821.5786	**848.0745**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	866.5004	808.7560	**837.6282**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	855.5106	794.1590	**824.8348**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	938.5633	881.6941	**910.1287**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	929.9028	867.9333	**898.9181**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.7859	0.7382	**0.7621**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.8207	0.7660	**0.7933**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 27	Mar 27	Mar 27	
Start Time (approx.)		07:47	09:08	10:27	
Stop Time (approx.)		08:47	10:08	11:27	
Sampling Conditions					
Y_d	Dry gas meter correction factor	0.9906	0.9906	0.9906	
P_g	Static pressure (in. H_2O)	-11.2000	-11.1000	-12.1000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	30.10	30.10	30.10	**30.1000**
O_2	Oxygen (dry volume %)	8.7700	8.8700	9.7000	**9.1133**
CO_2	Carbon dioxide (dry volume %)	10.5100	10.4900	9.6700	**10.2233**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.7200	80.6400	80.6300	**80.6633**
V_{lc}	Total Liquid collected (ml)	220.70	224.70	227.90	
V_m	Volume metered, meter conditions (ft^3)	40.2700	40.7550	40.6400	
T_m	Dry gas meter temperature (°F)	57.9167	66.0833	69.7083	
T_s	Sample temperature (°F)	296.0833	294.0833	297.0000	**295.7222**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.5000	1.5000	1.5000	
θ	Total sampling time (min)	60.0	60.0	60.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	10.3861	10.5744	10.7250	**10.5618**
V_{mstd}	Volume metered, standard (dscf)	41.0463	40.8958	40.5013	**40.8144**
P_s	Sample gas pressure, absolute (in. Hg)	29.2765	29.2838	29.2103	**29.2569**
P_v	Vapor pressure, actual (in. Hg)	29.2765	29.2838	29.2103	**29.2569**
B_{wo}	Moisture measured in sample (% by volume)	20.1938	20.5447	20.9365	**20.5583**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	20.1938	20.5447	20.9365	**20.5583**
M_d	MW of sample gas, dry (lb/lb-mole)	30.0324	30.0332	29.9352	**30.0003**
M_s	MW of sample gas, wet (lb/lb-mole)	27.6026	27.5610	27.4364	**27.5333**

Comments:

Average includes 3 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 27	Mar 27	Mar 27	
Start Time (approx.)		07:47	09:08	10:27	
Stop Time (approx.)		08:47	10:08	11:27	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	188.8	185.4	188.1	**187.4**
P_1	Fabric Filter Inlet Temperature - (°F)	322	320	321	**321**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Gas Conditions					
O_2	Oxygen (dry volume %)	8.7700	8.8700	9.7000	**9.1133**
CO_2	Carbon dioxide (dry volume %)	10.5100	10.4900	9.6700	**10.2233**
T_s	Sample temperature (°F)	296.0833	294.0833	297.0000	**295.7222**
B_w	Actual water vapor in gas (% by volume)	20.1938	20.5447	20.9365	**20.5583**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	41.0463	40.8958	40.5013	**40.8144**
Laboratory Data					
m_n	Total HCl collected (mg)	10.1923	9.6575	9.4471	
Hydrogen Chloride (HCl) Results					
C_{sd}	HCl Concentration (lb/dscf)	5.4753E-07	5.2071E-07	5.1432E-07	**5.2752E-07**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	6.2743E-07	6.0165E-07	6.3831E-07	**6.2246E-07**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	6.2515E-07	5.9566E-07	6.3825E-07	**6.1969E-07**
C_{sd}	HCl Concentration (ppmdv)	5.7888	5.5052	5.4377	**5.5773**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	6.6335	6.3610	6.7486	**6.5810**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	6.6095	6.2977	6.7480	**6.5517**
C_w	HCl Concentration (ppmwv)	4.6198	4.3742	4.2993	**4.4311**
C_{sd}	HCl Concentration (mg/dscm)	8.7679	8.3384	8.2362	**8.4475**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	10.0473	9.6346	10.2217	**9.9679**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	10.0110	9.5387	10.2207	**9.9235**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	9.4095	8.9485	8.8388	**9.0656**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	10.7825	10.3395	10.9696	**10.6972**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	10.7435	10.2367	10.9686	**10.6496**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.0090	0.0087	0.0092	**0.0090**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.0095	0.0090	0.0097	**0.0094**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	
Stop Time (approx.)		14:24	09:41	12:11	
Sampling Conditions					
Y_d	Dry gas meter correction factor	0.9854	0.9854	0.9854	
C_p	Pitot tube coefficient	0.8240	0.8240	0.8240	
P_g	Static pressure (in. H_2O)	-9.8000	-9.8000	-10.7000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.90	30.18	30.10	**30.0600**
D_n	Nozzle diameter (in.)	0.2725	0.2725	0.2725	
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	**9.5767**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	**9.6967**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.7800	80.7000	80.7000	**80.7267**
V_{lc}	Total Liquid collected (ml)	352.50	351.70	331.70	
V_m	Volume metered, meter conditions (ft^3)	68.0900	68.2550	71.1200	
T_m	Dry gas meter temperature (°F)	80.3000	60.8000	77.9400	
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	**316.6800**
ΔH	Meter box orifice pressure drop (in. H_2O)	0.9652	0.9700	1.0180	
θ	Total sampling time (min)	125.0	125.0	125.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	16.5887	16.5510	15.6098	**16.2498**
V_{mstd}	Volume metered, standard (dscf)	65.6539	68.9158	69.3448	**67.9715**
P_s	Sample gas pressure, absolute (in. Hg)	29.1794	29.4594	29.3132	**29.3174**
P_v	Vapor pressure, actual (in. Hg)	29.1794	29.4594	29.3132	**29.3174**
B_{wo}	Moisture measured in sample (% by volume)	20.1704	19.3654	18.3743	**19.3034**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	**19.3034**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.5862	0.6092	0.6247	**0.6067**
M_d	MW of sample gas, dry (lb/lb-mole)	29.8992	29.9804	29.9240	**29.9345**
M_s	MW of sample gas, wet (lb/lb-mole)	27.4991	27.6603	27.7331	**27.6308**
V_s	Velocity of sample (ft/sec)	40.0285	42.1532	43.3775	**41.8530**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	**99.5370**
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	**160,716**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	**107,033**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	**86,384**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	66,923	72,464	71,743	**70,377**
Q_a	Volumetric flow rate, actual (acf/hr)	9,222,561	9,712,098	9,994,166	**9,642,941**
Q_s	Volumetric flow rate, standard (scf/hr)	6,298,717	6,422,417	6,544,847	**6,421,994**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,028,240	5,178,690	5,342,279	**5,183,070**
Q_a	Volumetric flow rate, actual (m^3/hr)	261,188	275,052	283,041	**273,094**
Q_s	Volumetric flow rate, standard (m^3/hr)	178,383	181,887	185,354	**181,875**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	142,403	146,664	151,296	**146,788**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	113,717	123,134	121,908	**119,586**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	166,221	169,485	172,716	**169,474**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	132,693	136,664	140,981	**136,779**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	105,964	114,739	113,596	**111,433**

Comments:
Average includes 3 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Emission Parameters for FPM

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	
Stop Time (approx.)		14:24	09:41	12:11	
Process Conditions					
R_p	Steam Production Rate (Klbs/hr)	187.1	187.2	187.2	**187.2**
P_1	Fabroc Filter Inlet Temperature (°F)	315	316	318	**316**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	**9.5767**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	**9.6967**
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	**316.6800**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	**19.3034**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	**160,716**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	**107,033**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	**86,384**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	66,923	72,464	71,743	**70,377**
Q_a	Volumetric flow rate, actual (acf/hr)	9,222,561	9,712,098	9,994,166	**9,642,941**
Q_s	Volumetric flow rate, standard (scf/hr)	6,298,717	6,422,417	6,544,847	**6,421,994**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,028,240	5,178,690	5,342,279	**5,183,070**
Q_a	Volumetric flow rate, actual (m^3/hr)	261,188	275,052	283,041	**273,094**
Q_s	Volumetric flow rate, standard (m^3/hr)	178,383	181,887	185,354	**181,875**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	142,403	146,664	151,296	**146,788**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	113,717	123,134	121,908	**119,586**
Q_a	Volumetric flow rate, normal (Nm^3/hr)	166,221	169,485	172,716	**169,474**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	132,693	136,664	140,981	**136,779**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	105,964	114,739	113,596	**111,433**
Sampling Data					
V_{metd}	Volume metered, standard (dscf)	65.8539	68.9158	69.3448	**67.9715**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	**99.5370**
Laboratory Data					
m_{filter}	Matter collected on filter(s) (g)	0.00940	0.01080	0.00930	
m_s	Matter collected in solvent rinse(s) (g)	0.00614	0.00878	0.01299	
m_n	Total filterable particulate matter (g)	0.01554	0.01958	0.02229	
n_{MDL}	Number of non-detectable fractions	N/A	N/A	N/A	
DLC	Detection level classification	ADL	ADL	ADL	
Filterable Particulate Matter Results					
C_{sd}	Particulate Concentration (lb/dscf)	5.2188E-07	6.2658E-07	7.0891E-07	**6.1912E-07**
C_{sd7}	Particulate Concentration @7% O_2 (lb/dscf)	6.5352E-07	7.4631E-07	8.7981E-07	**7.5988E-07**
C_{sd12}	Particulate Concentration @12% CO_2 (lb/dscf)	6.6481E-07	7.4667E-07	8.8614E-07	**7.6587E-07**
C_a	Particulate Concentration (lb/acf)	2.8453E-07	3.3411E-07	3.7894E-07	**3.3253E-07**
C_{sd}	Particulate Concentration (gr/dscf)	0.0037	0.0044	0.0050	**0.0043**
C_{sd7}	Particulate Concentration @7% O_2 (gr/dscf)	0.0046	0.0052	0.0062	**0.0053**
C_{sd12}	Particulate Concentration @12% CO_2 (gr/dscf)	0.0047	0.0052	0.0062	**0.0054**
C_a	Particulate Concentration (gr/acf)	0.0020	0.0023	0.0027	**0.0023**
C_{sd}	Particulate Concentration (mg/dscm)	8.3571	10.0338	11.3522	**9.9144**
C_{sd7}	Particulate Concentration @7% O_2 (mg/dscm)	10.4652	11.9511	14.0889	**12.1684**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/dscm)	10.6460	11.9569	14.1903	**12.2644**
C_s	Particulate Concentration (mg/m^3 (actual,wet))	4.5584	5.3502	6.0682	**5.3249**
C_{sd}	Particulate Concentration (mg/Nm^3 dry)	8.9686	10.7680	12.1829	**10.6398**
C_{sd7}	Particulate Concentration @7% O_2 (mg/Nm^3 dry)	11.2310	12.8256	15.1198	**13.0588**
C_{sd12}	Particulate Concentration @12% CO_2 (mg/Nm^3 dry)	11.4250	12.8318	15.2286	**13.1618**
$E_{lb/hr}$	Particulate Rate (lb/hr)	2.6241	3.2449	3.7872	**3.2187**
$E_{kg/hr}$	Particulate Rate (kg/hr)	1.1901	1.4716	1.7175	**1.4597**
$E_{T/yr}$	Particulate Rate (Ton/yr)	11.4937	14.2125	16.5879	**14.0980**
E_{Fd}	Particulate Rate - F_d-based (lb/MMBtu)	0.0094	0.0107	0.0127	**0.0109**
E_{Fc}	Particulate Rate - F_c-based (lb/MMBtu)	0.0101	0.0113	0.0134	**0.0116**
E_{HI}	Particulate Rate - Heat Input-based (lb/MMBtu)	N/A	N/A	N/A	
E_{Rp}	Particulate Rate - Production-based (lb/Klbs)	0.0140	0.0173	0.0202	**0.0172**
E_{Rp}	Particulate Rate - Production-based (kg/Klbs)	0.0064	0.0079	0.0092	**0.0078**

Comments:

Average includes 3 runs.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	
Stop Time (approx.)		14:24	09:41	12:11	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	187.1	187.2	187.2	**187.2**
P_1	Fabric Filter Inlet Temperature - (°F)	315	316	318	**316**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	**9.5767**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	**9.6967**
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	**316.6800**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	**19.3034**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	**160,716**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	**107,033**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	**86,384**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	65.6539	68.9158	69.3448	**67.9715**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	**99.5370**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	5.2617	3.6665	4.1661	
Cadmium Results - Total					
C_{sd}	Concentration (lb/dscf)	1.7672E-10	1.1731E-10	1.3247E-10	**1.4217E-10**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	2.2129E-10	1.3973E-10	1.6441E-10	**1.7514E-10**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	2.2512E-10	1.3979E-10	1.6559E-10	**1.7683E-10**
C_a	Concentration (lb/acf)	9.6347E-11	6.2553E-11	7.0811E-11	**7.6570E-11**
C_{sd}	Concentration (µg/dscm)	2.8299E+00	1.8786E+00	2.1213E+00	**2.2766E+00**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	3.5437E+00	2.2375E+00	2.6327E+00	**2.8047E+00**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	3.6049E+00	2.2386E+00	2.6517E+00	**2.8317E+00**
C_{sd}	Concentration (mg/dscm)	2.8299E-03	1.8786E-03	2.1213E-03	**2.2766E-03**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	3.5437E-03	2.2375E-03	2.6327E-03	**2.8047E-03**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	3.6049E-03	2.2386E-03	2.6517E-03	**2.8317E-03**
C_a	Concentration (µg/m^3 (actual,wet))	1.5429E+00	1.0017E+00	1.1339E+00	**1.2262E+00**
C_{sd}	Concentration (µg/Nm^3 dry)	3.0369E+00	2.0160E+00	2.2766E+00	**2.4432E+00**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	3.8030E+00	2.4013E+00	2.8254E+00	**3.0099E+00**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	3.8687E+00	2.4024E+00	2.8457E+00	**3.0389E+00**
$E_{lb/hr}$	Rate (lb/hr)	8.8857E-04	6.0752E-04	7.0770E-04	**7.3459E-04**
$E_{g/s}$	Rate (g/s)	1.1194E-04	7.6533E-05	8.9153E-05	**9.2542E-05**
$E_{T/yr}$	Rate (Ton/yr)	3.8919E-03	2.6609E-03	3.0997E-03	**3.2175E-03**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	3.1843E-06	2.0106E-06	2.3657E-06	**2.5202E-06**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	3.4142E-06	2.1202E-06	2.5114E-06	**2.6820E-06**

Prepared by Clean Air Engineering Proprietary Software
SS Metals-1 Version 2008-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Emission Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	
Stop Time (approx.)		14:24	09:41	12:11	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	187.1	187.2	187.2	**187.2**
P_1	Fabric Filter Inlet Temperature - (°F)	315	316	318	**316**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	**8,760**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	**9.5767**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	**9.6967**
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	**316.6800**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	**19.3034**
Gas Flow Rate					
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	**160,716**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	**107,033**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	**86,384**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	65.6539	68.9158	69.3448	**67.9715**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	**99.5370**
Laboratory Data					
m_n	Total matter corrected for allowable blanks (µg)	39.7396	27.0566	31.8773	
Lead Results - Total					
C_{sd}	Concentration (lb/dscf)	1.3347E-09	8.6569E-10	1.0136E-09	**1.0713E-09**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	1.6713E-09	1.0311E-09	1.2580E-09	**1.3201E-09**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	1.7002E-09	1.0316E-09	1.2670E-09	**1.3329E-09**
C_a	Concentration (lb/acf)	7.2767E-10	4.6160E-10	5.4182E-10	**5.7703E-10**
C_{sd}	Concentration (µg/dscm)	2.1373E+01	1.3863E+01	1.6232E+01	**1.7156E+01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	2.6764E+01	1.6512E+01	2.0145E+01	**2.1140E+01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	2.7226E+01	1.6520E+01	2.0290E+01	**2.1345E+01**
C_{sd}	Concentration (mg/dscm)	2.1373E-02	1.3863E-02	1.6232E-02	**1.7156E-02**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	2.6764E-02	1.6512E-02	2.0145E-02	**2.1140E-02**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	2.7226E-02	1.6520E-02	2.0290E-02	**2.1345E-02**
C_a	Concentration (µg/m^3 (actual,wet))	1.1653E+01	7.3920E+00	8.6765E+00	**9.2404E+00**
C_{sd}	Concentration (µg/Nm^3 dry)	2.2937E+01	1.4877E+01	1.7419E+01	**1.8411E+01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	2.8722E+01	1.7720E+01	2.1619E+01	**2.2687E+01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	2.9219E+01	1.7729E+01	2.1774E+01	**2.2907E+01**
$E_{lb/hr}$	Rate (lb/hr)	6.7110E-03	4.4832E-03	5.4151E-03	**5.5364E-03**
$E_{g/s}$	Rate (g/s)	8.4543E-04	5.6477E-04	6.8217E-04	**6.9746E-04**
$E_{T/yr}$	Rate (Ton/yr)	2.9394E-02	1.9636E-02	2.3718E-02	**2.4249E-02**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	2.4050E-05	1.4837E-05	1.8102E-05	**1.8996E-05**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	2.5786E-05	1.5646E-05	1.9217E-05	**2.0216E-05**

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SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Sampling Conditions						
Y_d	Dry gas meter correction factor	0.9854	0.9854	0.9854	0.9854	
C_p	Pitot tube coefficient	0.8240	0.8240	0.8240	0.8240	
P_g	Static pressure (in. H_2O)	-9.8000	-9.8000	-10.7000	-10.7000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.90	30.18	30.10	30.10	**30.0700**
D_n	Nozzle diameter (in.)	0.2725	0.2725	0.2725	0.2725	
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	10.0200	**9.6875**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	9.3700	**9.6150**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.7800	80.7000	80.7000	80.6100	**80.6975**
V_{lc}	Total Liquid collected (ml)	352.50	351.70	331.70	356.20	
V_m	Volume metered, meter conditions (ft^3)	68.0900	68.2550	71.1200	75.3050	
T_m	Dry gas meter temperature (°F)	80.3000	80.8000	77.9400	78.1800	
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	324.0400	**318.5200**
ΔH	Meter box orifice pressure drop (in. H_2O)	0.9652	0.9700	1.0180	1.1324	
θ	Total sampling time (min)	125.0	125.0	125.0	125.0	
Flow Results						
V_{wstd}	Volume of water collected (ft^3)	16.5887	16.5510	15.6098	16.7628	**16.3781**
V_{mstd}	Volume metered, standard (dscf)	65.6539	68.9158	69.3448	73.4131	**69.3319**
P_s	Sample gas pressure, absolute (in. Hg)	29.1794	29.4594	29.3132	29.3132	**29.3163**
P_v	Vapor pressure, actual (in. Hg)	29.1794	29.4594	29.3132	29.3132	**29.3163**
B_{wo}	Moisture measured in sample (% by volume)	20.1704	19.3654	18.3743	18.5890	**19.1248**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	18.5890	**19.1248**
$\sqrt{\Delta P}$	Velocity head ($\sqrt{}$in. H_2O)	0.5862	0.6092	0.6247	0.6446	**0.6162**
M_d	MW of sample gas, dry (lb/lb-mole)	29.8992	29.9804	29.9240	29.9000	**29.9259**
M_s	MW of sample gas, wet (lb/lb-mole)	27.4991	27.6603	27.7331	27.6879	**27.6451**
V_s	Velocity of sample (ft/sec)	40.0285	42.1532	43.3775	44.6281	**42.5468**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	100.8829	**99.8734**
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	171,372	**163,380**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	113,068	**108,542**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	92,049	**87,801**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dscfm)	66,923	72,464	71,743	72,050	**70,795**
Q_a	Volumetric flow rate, actual (acf/hr)	9,222,561	9,712,098	9,994,166	10,282,325	**9,802,787**
Q_s	Volumetric flow rate, standard (scf/hr)	6,298,717	6,422,417	6,544,847	6,784,052	**6,512,508**
Q_{std}	Volumetric flow rate, dry standard (dscf/hr)	5,028,240	5,178,690	5,342,279	5,522,966	**5,268,044**
Q_a	Volumetric flow rate, actual (m^3/hr)	261,188	275,052	283,041	291,201	**277,621**
Q_s	Volumetric flow rate, standard (m^3/hr)	178,383	181,887	185,354	192,128	**184,438**
Q_{std}	Volumetric flow rate, dry standard (dry m^3/hr)	142,403	146,664	151,296	156,414	**149,194**
Q_{std7}	Volumetric flow rate, dry std@7%O_2 (dry m^3/hr)	113,717	123,134	121,908	122,430	**120,297**
Q_s	Volumetric flow rate, normal (Nm^3/hr)	166,221	169,485	172,716	179,029	**171,863**
Q_{std}	Volumetric flow rate, dry normal (Nm^3/hr)	132,693	136,664	140,981	145,749	**139,022**
Q_{std7}	Volumetric flow rate, dry normal @7%O_2 (Nm^3/hr)	105,964	114,739	113,596	114,083	**112,095**

Comments:
Average includes 4 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Process Conditions						
R_P	Steam Production Rate - (Klbs/hour)	187.1	187.2	187.2	186.8	**187.1**
P_1	Fabric Filter Inlet Temperature - (°F)	315	316	318	312	**315**
P_2	Carbon Feed Rate - (lbs/hr)	6	6	6	6	**6**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	1,820	**1,820**
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	8,760	**8,760**
Gas Conditions						
O_2	Oxygen (dry volume %)	9.8000	9.2300	9.7000	10.0200	**9.6875**
CO_2	Carbon dioxide (dry volume %)	9.4200	10.0700	9.6000	9.3700	**9.6150**
T_s	Sample temperature (°F)	293.9600	326.1600	329.9200	324.0400	**318.5200**
B_w	Actual water vapor in gas (% by volume)	20.1704	19.3654	18.3743	18.5890	**19.1248**
Gas Flow Rate						
Q_a	Volumetric flow rate, actual (acfm)	153,709	161,868	166,569	171,372	**163,380**
Q_s	Volumetric flow rate, standard (scfm)	104,979	107,040	109,081	113,068	**108,542**
Q_{std}	Volumetric flow rate, dry standard (dscfm)	83,804	86,312	89,038	92,049	**87,801**
Sampling Data						
V_{mstd}	Volume metered, standard (dscf)	65.6539	68.9158	69.3448	73.4131	**69.3319**
%I	Isokinetic sampling (%)	99.0970	100.9986	98.5153	100.8829	**99.8734**
Laboratory Data						
$m_{n\text{-}1b}$	Fraction 1B (µg)	<0.1000	0.1468	<0.1000	0.1548	
$m_{n\text{-}2b}$	Fraction 2B (µg)	1.3447	3.1709	3.2687	2.4133	
$m_{n\text{-}3a}$	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000	
$m_{n\text{-}3b}$	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000	
$m_{n\text{-}3c}$	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000	
m_n	Total matter corrected for allowable blanks (µg)	1.3447	3.3176	3.2687	2.5681	
Mercury Results - Total						
C_{sd}	Concentration (lb/dscf)	4.5162E-11	1.0615E-10	1.0394E-10	7.7134E-11	**8.3095E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	5.6555E-11	1.2643E-10	1.2899E-10	9.8545E-11	**1.0263E-10**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	5.7532E-11	1.2649E-10	1.2992E-10	9.8785E-11	**1.0318E-10**
C_a	Concentration (lb/acf)	2.4623E-11	5.6601E-11	5.5558E-11	4.1431E-11	**4.4553E-11**
C_{sd}	Concentration (µg/dscm)	7.2321E-01	1.6998E+00	1.6644E+00	1.2352E+00	**1.3307E+00**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	9.0564E-01	2.0247E+00	2.0656E+00	1.5781E+00	**1.6435E+00**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	9.2129E-01	2.0256E+00	2.0805E+00	1.5819E+00	**1.6523E+00**
C_{sd}	Concentration (mg/dscm)	7.2321E-04	1.6998E-03	1.6644E-03	1.2352E-03	**1.3307E-03**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	9.0564E-04	2.0247E-03	2.0656E-03	1.5781E-03	**1.6435E-03**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	9.2129E-04	2.0256E-03	2.0805E-03	1.5819E-03	**1.6523E-03**
C_a	Concentration (µg/m^3 (actual,wet))	3.9430E-01	9.0639E-01	8.8968E-01	6.6347E-01	**7.1346E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	7.7613E-01	1.8242E+00	1.7862E+00	1.3256E+00	**1.4280E+00**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	9.7191E-01	2.1728E+00	2.2168E+00	1.6935E+00	**1.7637E+00**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	9.8870E-01	2.1738E+00	2.2327E+00	1.6976E+00	**1.7732E+00**
$E_{lb/hr}$	Rate (lb/hr)	2.2709E-04	5.4971E-04	5.5525E-04	4.2601E-04	**4.3952E-04**
$E_{g/s}$	Rate (g/s)	2.8608E-05	6.9251E-05	6.9949E-05	5.3667E-05	**5.5369E-05**
$E_{T/yr}$	Rate (Ton/yr)	9.9464E-04	2.4078E-03	2.4320E-03	1.8659E-03	**1.9251E-03**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	8.1379E-07	1.8193E-06	1.8561E-06	1.4180E-06	**1.4768E-06**
E_{Fo}	Rate - Fc-based (lb/MMBtu)	8.7256E-07	1.9185E-06	1.9704E-06	1.4982E-06	**1.5649E-06**

Prepared by Clean Air Engineering Proprietary Software
SS Metals-1 Version 2006-12c

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Front Half Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Mercury Results - Front Half						
C_{sd}	Concentration (lb/dscf)	<3.3585E-12	4.6958E-12	<3.1798E-12	4.6502E-12	**<3.9711E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<4.2057E-12	5.5931E-12	<3.9463E-12	5.9410E-12	**<4.9215E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<4.2784E-12	5.5958E-12	<3.9747E-12	5.9554E-12	**<4.9511E-12**
C_a	Concentration (lb/acf)	<1.8311E-12	2.5039E-12	<1.6997E-12	2.4978E-12	**<2.1331E-12**
C_{sd}	Concentration (µg/dscm)	<5.3782E-02	7.5197E-02	<5.0919E-02	7.4466E-02	**<6.3591E-02**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<6.7349E-02	8.9566E-02	<6.3195E-02	9.5136E-02	**<7.8811E-02**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<6.8512E-02	8.9609E-02	<6.3649E-02	9.5368E-02	**<7.9285E-02**
C_{sd}	Concentration (mg/dscm)	<5.3782E-05	7.5197E-05	<5.0919E-05	7.4466E-05	**<6.3591E-05**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<6.7349E-05	8.9566E-05	<6.3195E-05	9.5136E-05	**<7.8811E-05**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<6.8512E-05	8.9609E-05	<6.3649E-05	9.5368E-05	**<7.9285E-05**
C_a	Concentration (µg/m^3 (actual,wet))	<2.9323E-02	4.0097E-02	<2.7218E-02	3.9998E-02	**<3.4159E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<5.7717E-02	8.0699E-02	<5.4645E-02	7.9915E-02	**<6.8244E-02**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<7.2277E-02	9.6120E-02	<6.7819E-02	1.0210E-01	**<8.4578E-02**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<7.3525E-02	9.6166E-02	<6.8307E-02	1.0235E-01	**<8.5086E-02**
$E_{lb/hr}$	Rate (lb/hr)	<1.6887E-05	2.4318E-05	<1.6987E-05	2.5683E-05	**<2.0969E-05**
$E_{g/s}$	Rate (g/s)	<2.1274E-06	3.0635E-06	<2.1400E-06	3.2354E-06	**<2.6416E-06**
$E_{T/yr}$	Rate (Ton/yr)	<7.3967E-05	1.0651E-04	<7.4404E-05	1.1249E-04	**<9.1844E-05**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<6.0518E-08	8.0482E-08	<5.6785E-08	8.5487E-08	**<7.0818E-08**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<6.4889E-08	8.4870E-08	<6.0283E-08	9.0324E-08	**<7.5091E-08**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 1-3 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Mercury Results - Impingers 1-3 Solution						
C_{sd}	Concentration (lb/dscf)	4.5162E-11	1.0145E-10	1.0394E-10	7.2484E-11	**8.0759E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	5.6555E-11	1.2084E-10	1.2899E-10	9.2604E-11	**9.9748E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	5.7532E-11	1.2090E-10	1.2992E-10	9.2829E-11	**1.0029E-10**
C_a	Concentration (lb/acf)	2.4623E-11	5.4097E-11	5.5558E-11	3.8934E-11	**4.3303E-11**
C_{sd}	Concentration (µg/dscm)	7.2321E-01	1.6246E+00	1.6644E+00	1.1607E+00	**1.2932E+00**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	9.0564E-01	1.9351E+00	2.0656E+00	1.4829E+00	**1.5973E+00**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	9.2129E-01	1.9360E+00	2.0805E+00	1.4865E+00	**1.6061E+00**
C_{sd}	Concentration (mg/dscm)	7.2321E-04	1.6246E-03	1.6644E-03	1.1607E-03	**1.2932E-03**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	9.0564E-04	1.9351E-03	2.0656E-03	1.4829E-03	**1.5973E-03**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	9.2129E-04	1.9360E-03	2.0805E-03	1.4865E-03	**1.6061E-03**
C_a	Concentration (µg/m^3 (actual,wet))	3.9430E-01	8.6629E-01	8.8968E-01	6.2347E-01	**6.9343E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	7.7613E-01	1.7435E+00	1.7862E+00	1.2457E+00	**1.3879E+00**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	9.7191E-01	2.0767E+00	2.2168E+00	1.5914E+00	**1.7142E+00**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	9.8870E-01	2.0777E+00	2.2327E+00	1.5953E+00	**1.7236E+00**
$E_{lb/hr}$	Rate (lb/hr)	2.2709E-04	5.2540E-04	5.5525E-04	4.0033E-04	**4.2702E-04**
$E_{g/s}$	Rate (g/s)	2.8608E-05	6.6188E-05	6.9949E-05	5.0432E-05	**5.3794E-05**
$E_{T/yr}$	Rate (Ton/yr)	9.9464E-04	2.3012E-03	2.4320E-03	1.7534E-03	**1.8703E-03**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	8.1379E-07	1.7388E-06	1.8561E-06	1.3325E-06	**1.4353E-06**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	8.7256E-07	1.8336E-06	1.9704E-06	1.4079E-06	**1.5211E-06**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 4 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Mercury Results - Impinger 4 Solution						
C_{sd}	Concentration (lb/dscf)	<6.7170E-12	<6.3991E-12	<6.3595E-12	<6.0071E-12	**<6.3707E-12**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<8.4114E-12	<7.6219E-12	<7.8926E-12	<7.6745E-12	**<7.9001E-12**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<8.5567E-12	<7.6256E-12	<7.9494E-12	<7.6932E-12	**<7.9562E-12**
C_a	Concentration (lb/acf)	<3.6622E-12	<3.4121E-12	<3.3994E-12	<3.2266E-12	**<3.4251E-12**
C_{sd}	Concentration (µg/dscm)	<1.0756E-01	<1.0247E-01	<1.0184E-01	<9.6195E-02	**<1.0202E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<1.3470E-01	<1.2205E-01	<1.2639E-01	<1.2290E-01	**<1.2651E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<1.3702E-01	<1.2211E-01	<1.2730E-01	<1.2320E-01	**<1.2741E-01**
C_{sd}	Concentration (mg/dscm)	<1.0756E-04	<1.0247E-04	<1.0184E-04	<9.6195E-05	**<1.0202E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<1.3470E-04	<1.2205E-04	<1.2639E-04	<1.2290E-04	**<1.2651E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<1.3702E-04	<1.2211E-04	<1.2730E-04	<1.2320E-04	**<1.2741E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<5.8645E-02	<5.4641E-02	<5.4437E-02	<5.1670E-02	**<5.4848E-02**
C_{sd}	Concentration (µg/Nm^3 dry)	<1.1543E-01	<1.0997E-01	<1.0929E-01	<1.0323E-01	**<1.0948E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<1.4455E-01	<1.3098E-01	<1.3564E-01	<1.3189E-01	**<1.3577E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<1.4705E-01	<1.3105E-01	<1.3661E-01	<1.3221E-01	**<1.3673E-01**
$E_{lb/hr}$	Rate (lb/hr)	<3.3775E-05	<3.3139E-05	<3.3974E-05	<3.3177E-05	**<3.3516E-05**
$E_{g/s}$	Rate (g/s)	<4.2548E-06	<4.1747E-06	<4.2800E-06	<4.1795E-06	**<4.2223E-06**
$E_{T/yr}$	Rate (Ton/yr)	<1.4793E-04	<1.4515E-04	<1.4881E-04	<1.4532E-04	**<1.4680E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<1.2104E-07	<1.0967E-07	<1.1357E-07	<1.1043E-07	**<1.1368E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<1.2978E-07	<1.1565E-07	<1.2057E-07	<1.1668E-07	**<1.2067E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Emission Parameters (continued)
Separate Impinger 5-6 Results

Run No.		1	2	3	4	Average
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27	
Start Time (approx.)		12:11	07:28	09:59	12:29	
Stop Time (approx.)		14:24	09:41	12:11	14:41	
Mercury Results - Filtered Permanganate Solution						
C_{sd}	Concentration (lb/dscf)	<1.6793E-11	<1.5998E-11	<1.5899E-11	<1.5018E-11	**<1.5927E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<2.1029E-11	<1.9055E-11	<1.9732E-11	<1.9186E-11	**<1.9750E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<2.1392E-11	<1.9064E-11	<1.9874E-11	<1.9233E-11	**<1.9891E-11**
C_a	Concentration (lb/acf)	<9.1555E-12	<8.5303E-12	<8.4985E-12	<8.0665E-12	**<8.5627E-12**
C_{sd}	Concentration (µg/dscm)	<2.6891E-01	<2.5618E-01	<2.5460E-01	<2.4049E-01	**<2.5504E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<3.3674E-01	<3.0514E-01	<3.1597E-01	<3.0724E-01	**<3.1627E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<3.4256E-01	<3.0528E-01	<3.1825E-01	<3.0799E-01	**<3.1852E-01**
C_{sd}	Concentration (mg/dscm)	<2.6891E-04	<2.5618E-04	<2.5460E-04	<2.4049E-04	**<2.5504E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<3.3674E-04	<3.0514E-04	<3.1597E-04	<3.0724E-04	**<3.1627E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<3.4256E-04	<3.0528E-04	<3.1825E-04	<3.0799E-04	**<3.1852E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.4661E-01	<1.3660E-01	<1.3609E-01	<1.2917E-01	**<1.3712E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<2.8859E-01	<2.7493E-01	<2.7323E-01	<2.5809E-01	**<2.7371E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<3.6138E-01	<3.2746E-01	<3.3909E-01	<3.2972E-01	**<3.3942E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<3.6763E-01	<3.2762E-01	<3.4153E-01	<3.3053E-01	**<3.4183E-01**
$E_{lb/hr}$	Rate (lb/hr)	<8.4437E-05	<8.2848E-05	<8.4936E-05	<8.2943E-05	**<8.3791E-05**
$E_{g/s}$	Rate (g/s)	<1.0637E-05	<1.0437E-05	<1.0700E-05	<1.0449E-05	**<1.0556E-05**
$E_{T/yr}$	Rate (Ton/yr)	<3.6984E-04	<3.6287E-04	<3.7202E-04	<3.6329E-04	**<3.6700E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<3.0259E-07	<2.7419E-07	<2.8393E-07	<2.7608E-07	**<2.8420E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<3.2444E-07	<2.8914E-07	<3.0141E-07	<2.9170E-07	**<3.0167E-07**
Mercury Results - HCl Rinse + HCl/MnO2 Precipitate						
C_{sd}	Concentration (lb/dscf)	<1.3434E-11	<1.2798E-11	<1.2719E-11	<1.2014E-11	**<1.2741E-11**
C_{sd7}	Concentration @7% O_2 (lb/dscf)	<1.6823E-11	<1.5244E-11	<1.5785E-11	<1.5349E-11	**<1.5800E-11**
C_{sd12}	Concentration @12% CO_2 (lb/dscf)	<1.7113E-11	<1.5251E-11	<1.5899E-11	<1.5386E-11	**<1.5912E-11**
C_a	Concentration (lb/acf)	<7.3244E-12	<6.8243E-12	<6.7988E-12	<6.4532E-12	**<6.8502E-12**
C_{sd}	Concentration (µg/dscm)	<2.1513E-01	<2.0495E-01	<2.0368E-01	<1.9239E-01	**<2.0404E-01**
C_{sd7}	Concentration @7% O_2 (µg/dscm)	<2.6939E-01	<2.4411E-01	<2.5278E-01	<2.4579E-01	**<2.5302E-01**
C_{sd12}	Concentration @12% CO_2 (µg/dscm)	<2.7405E-01	<2.4423E-01	<2.5460E-01	<2.4639E-01	**<2.5482E-01**
C_{sd}	Concentration (mg/dscm)	<2.1513E-04	<2.0495E-04	<2.0368E-04	<1.9239E-04	**<2.0404E-04**
C_{sd7}	Concentration @7% O_2 (mg/dscm)	<2.6939E-04	<2.4411E-04	<2.5278E-04	<2.4579E-04	**<2.5302E-04**
C_{sd12}	Concentration @12% CO_2 (mg/dscm)	<2.7405E-04	<2.4423E-04	<2.5460E-04	<2.4639E-04	**<2.5482E-04**
C_a	Concentration (µg/m^3 (actual,wet))	<1.1729E-01	<1.0928E-01	<1.0887E-01	<1.0334E-01	**<1.0970E-01**
C_{sd}	Concentration (µg/Nm^3 dry)	<2.3087E-01	<2.1994E-01	<2.1858E-01	<2.0647E-01	**<2.1897E-01**
C_{sd7}	Concentration @7% O_2 (µg/Nm^3 dry)	<2.8911E-01	<2.6197E-01	<2.7127E-01	<2.6378E-01	**<2.7153E-01**
C_{sd12}	Concentration @12% CO_2 (µg/Nm^3 dry)	<2.9410E-01	<2.6210E-01	<2.7323E-01	<2.6442E-01	**<2.7346E-01**
$E_{lb/hr}$	Rate (lb/hr)	<6.7550E-05	<6.6278E-05	<6.7949E-05	<6.6354E-05	**<6.7033E-05**
$E_{g/s}$	Rate (g/s)	<8.5097E-06	<8.3495E-06	<8.5599E-06	<8.3590E-06	**<8.4445E-06**
$E_{T/yr}$	Rate (Ton/yr)	<2.9587E-04	<2.9030E-04	<2.9762E-04	<2.9063E-04	**<2.9360E-04**
E_{Fd}	Rate - Fd-based (lb/MMBtu)	<2.4207E-07	<2.1935E-07	<2.2714E-07	<2.2086E-07	**<2.2736E-07**
E_{Fc}	Rate - Fc-based (lb/MMBtu)	<2.5955E-07	<2.3131E-07	<2.4113E-07	<2.3336E-07	**<2.4134E-07**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 SDA Inlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 26	Mar 26	
Start Time (approx.)		08:00	09:21	10:46	
Stop Time (approx.)		09:00	10:21	11:46	
Sampling Conditions					
Y_d	Dry gas meter correction factor	1.0050	1.0050	1.0050	
P_g	Static pressure (in. H_2O)	-1.1000	-1.0000	-1.1000	
A_s	Sample location area (ft^2)	60.1320	60.1320	60.1320	
P_{bar}	Barometric pressure (in. Hg)	29.90	29.90	29.90	**29.9000**
O_2	Oxygen (dry volume %)	9.8400	10.1500	9.0700	**9.6867**
CO_2	Carbon dioxide (dry volume %)	9.3800	9.0300	10.2900	**9.5667**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.7800	80.8200	80.6400	**80.7467**
V_{lc}	Total Liquid collected (ml)	133.60	144.90	142.70	
V_m	Volume metered, meter conditions (ft^3)	35.4400	37.2400	36.1600	
T_m	Dry gas meter temperature (°F)	72.5417	86.8333	85.9583	
T_s	Sample temperature (°F)	481.9167	486.6667	478.9167	**482.5000**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.2000	1.2000	1.2000	
θ	Total sampling time (min)	60.0	60.0	60.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	6.2872	6.8190	6.7155	**6.6072**
V_{mstd}	Volume metered, standard (dscf)	35.3798	36.2051	35.2115	**35.5988**
P_s	Sample gas pressure, absolute (in. Hg)	29.8191	29.8265	29.8191	**29.8216**
P_v	Vapor pressure, actual (in. Hg)	29.8191	29.8265	29.8191	**29.8216**
B_{wo}	Moisture measured in sample (% by volume)	15.0892	15.8492	16.0171	**15.6518**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	15.0892	15.8492	16.0171	**15.6518**
M_d	MW of sample gas, dry (lb/lb-mole)	29.8944	29.8508	30.0092	**29.9181**
M_s	MW of sample gas, wet (lb/lb-mole)	28.0996	27.9725	28.0857	**28.0526**

Comments:

Average includes 3 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 SDA Inlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 26	Mar 26	
Start Time (approx.)		08:00	09:21	10:46	
Stop Time (approx.)		09:00	10:21	11:46	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	186.8	187.3	187.0	**187.0**
P_1	Fabric Filter Inlet Temperature - (°F)	315	318	315	**316**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.8400	10.1500	9.0700	**9.6867**
CO_2	Carbon dioxide (dry volume %)	9.3800	9.0300	10.2900	**9.5667**
T_s	Sample temperature (°F)	481.9167	486.6667	478.9167	**482.5000**
B_w	Actual water vapor in gas (% by volume)	15.0892	15.8492	16.0171	**15.6518**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	35.3798	36.2051	35.2115	**35.5988**
Laboratory Data					
m_n	Total HCl collected (mg)	631.6032	643.0908	624.9068	
Hydrogen Chloride (HCl) Results					
C_{sd}	HCl Concentration (lb/dscf)	3.9364E-05	3.9166E-05	3.9133E-05	**3.9221E-05**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	4.9472E-05	5.0643E-05	4.5980E-05	**4.8698E-05**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	5.0359E-05	5.2048E-05	4.5636E-05	**4.9348E-05**
C_{sd}	HCl Concentration (ppmdv)	416.1779	414.0878	413.7339	**414.6665**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	523.0445	535.4251	486.1286	**514.8661**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	532.4237	550.2827	482.4885	**521.7317**
C_w	HCl Concentration (ppmwv)	353.3800	348.4580	347.4660	**349.7680**
C_{sd}	HCl Concentration (mg/dscm)	630.3567	627.1909	626.6550	**628.0675**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	792.2204	810.9724	736.3064	**779.8331**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	806.4265	833.4763	730.7930	**790.2319**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	676.4804	673.0829	672.5078	**674.0237**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	850.1878	870.3119	790.1824	**836.8940**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	865.4333	894.4624	784.2656	**848.0538**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.7119	0.7287	0.6616	**0.7007**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.7638	0.7894	0.6921	**0.7484**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 26A (HCl)
Sampling, Velocity and Moisture Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 26	Mar 26	
Start Time (approx.)		08:00	09:21	10:46	
Stop Time (approx.)		09:00	10:21	11:46	
Sampling Conditions					
Y_d	Dry gas meter correction factor	1.0008	1.0008	1.0008	
P_g	Static pressure (in. H_2O)	-9.9000	-10.1000	-9.1000	
A_s	Sample location area (ft^2)	64.0000	64.0000	64.0000	
P_{bar}	Barometric pressure (in. Hg)	29.90	29.90	29.90	**29.9000**
O_2	Oxygen (dry volume %)	9.8600	9.5600	9.5800	**9.6667**
CO_2	Carbon dioxide (dry volume %)	9.4700	9.7600	9.8100	**9.6800**
N_2+CO	Nitrogen plus carbon monoxide (dry volume %)	80.6700	80.6800	80.6100	**80.6533**
V_{lc}	Total Liquid collected (ml)	199.60	215.10	202.60	
V_m	Volume metered, meter conditions (ft^3)	38.7000	38.7950	38.9900	
T_m	Dry gas meter temperature (°F)	67.9583	71.7500	79.4167	
T_s	Sample temperature (°F)	294.5833	296.5000	293.4167	**294.8333**
ΔH	Meter box orifice pressure drop (in. H_2O)	1.5000	1.5000	1.5000	
θ	Total sampling time (min)	60.0	60.0	60.0	
Flow Results					
V_{wstd}	Volume of water collected (ft^3)	9.3932	10.1226	9.5344	**9.6834**
V_{mstd}	Volume metered, standard (dscf)	38.8354	38.6531	38.2953	**38.5946**
P_s	Sample gas pressure, absolute (in. Hg)	29.1721	29.1574	29.2309	**29.1868**
P_v	Vapor pressure, actual (in. Hg)	29.1721	29.1574	29.2309	**29.1868**
B_{wo}	Moisture measured in sample (% by volume)	19.4764	20.7534	19.9340	**20.0546**
B_{ws}	Saturated moisture content (% by volume)	100.0000	100.0000	100.0000	**100.0000**
B_w	Actual water vapor in gas (% by volume)	19.4764	20.7534	19.9340	**20.0546**
M_d	MW of sample gas, dry (lb/lb-mole)	29.9096	29.9440	29.9528	**29.9355**
M_s	MW of sample gas, wet (lb/lb-mole)	27.5900	27.4652	27.5701	**27.5418**

Comments:

Average includes 3 runs.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 26A (HCl)
HCl Parameters

Run No.		1	2	3	Average
Date (2013)		Mar 26	Mar 26	Mar 26	
Start Time (approx.)		08:00	09:21	10:46	
Stop Time (approx.)		09:00	10:21	11:46	
Process Conditions					
R_P	Steam Production Rate - (Klbs/hour)	186.8	187.3	187.0	**187.0**
P_1	Fabric Filter Inlet Temperature - (°F)	315	318	315	**316**
F_d	Oxygen-based F-factor (dscf/MMBtu)	9,570	9,570	9,570	**9,570**
F_c	Carbon dioxide-based F-factor (dscf/MMBtu)	1,820	1,820	1,820	**1,820**
Gas Conditions					
O_2	Oxygen (dry volume %)	9.8600	9.5600	9.5800	**9.6667**
CO_2	Carbon dioxide (dry volume %)	9.4700	9.7600	9.8100	**9.6800**
T_s	Sample temperature (°F)	294.5833	296.5000	293.4167	**294.8333**
B_w	Actual water vapor in gas (% by volume)	19.4764	20.7534	19.9340	**20.0546**
Sampling Data					
V_{mstd}	Volume metered, standard (dscf)	38.8354	38.6531	38.2953	**38.5946**
Laboratory Data					
m_n	Total HCl collected (mg)	12.8715	13.2047	13.7306	
Hydrogen Chloride (HCl) Results					
C_{sd}	HCl Concentration (lb/dscf)	7.3082E-07	7.5327E-07	7.9059E-07	**7.5823E-07**
C_{sd7}	HCl Concentration @7% O_2 (lb/dscf)	9.2015E-07	9.2332E-07	9.7078E-07	**9.3808E-07**
C_{sd12}	HCl Concentration @12% CO_2 (lb/dscf)	9.2607E-07	9.2615E-07	9.6709E-07	**9.3977E-07**
C_{sd}	HCl Concentration (ppmdv)	7.7267	7.9640	8.3586	**8.0164**
C_{sd7}	HCl Concentration @7% O_2 (ppmdv)	9.7283	9.7619	10.2637	**9.9180**
C_{sd12}	HCl Concentration @12% CO_2 (ppmdv)	9.7909	9.7918	10.2246	**9.9358**
C_w	HCl Concentration (ppmwv)	6.2218	6.3112	6.6924	**6.4085**
C_{sd}	HCl Concentration (mg/dscm)	11.7031	12.0626	12.6602	**12.1420**
C_{sd7}	HCl Concentration @7% O_2 (mg/dscm)	14.7349	14.7857	15.5457	**15.0221**
C_{sd12}	HCl Concentration @12% CO_2 (mg/dscm)	14.8297	14.8311	15.4865	**15.0491**
C_{sd}	HCl Concentration (mg/Nm^3 dry)	12.5594	12.9452	13.5866	**13.0304**
C_{sd7}	HCl Concentration @7% O_2 (mg/Nm^3 dry)	15.8130	15.8676	16.6832	**16.1213**
C_{sd12}	HCl Concentration @12% CO_2 (mg/Nm^3 dry)	15.9148	15.9163	16.6197	**16.1502**
E_{Fd}	HCl Rate - Fd-based (lb/MMBtu)	0.0132	0.0133	0.0140	**0.0135**
E_{Fc}	HCl Rate - Fc-based (lb/MMBtu)	0.0140	0.0140	0.0147	**0.0143**

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (CI)

Wheelabrator South Broward, Inc.
CleanAir Project No. 12218
Lime Silo

Visible Emission Parameters

Run	1
Date (2013)	Mar 26
Start Time	8:55

Time (min)	Time (sec) 15	30	45	60
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

Time (min)	Time (sec) 15	30	45	60
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53				
54				
55				
56				
57				
58				
59				

Average Opacity	**0**
Minimum Reading	**0**
Maximum Reading	**0**
No. of Readings >5%	**0**

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