APPENDIX A

Production Records

6/7/14

MASD

REPORTED BARRELS COUNT

1 - 247 PER HOUR

2 - 225

3 - 255

07:00
08:00
09:00
10:00
11:00
12:00
13:00
06/06/14
RMG1
100 TO 2450 DEG F
CHART
PORTAGE, INDIANA
TO FIT 30/35LB
USA INC.

APPENDIX B

EPA Method 25A - Gas Standards Certification Sheets

PRAXAIR

Praxair Distribution Mid-Atlantic
145 Shimersville Rd.
Bethlehem, PA 18015
Telephone: (610) 317-1608
Facsimile: (610) 758-8382

DocNumber: 000009313

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PDI WHSE BROOKFIELD WI HUB
100 N JANACEK RD
BROOKFIELD WI 530450

Praxair Order Number: 02803670
Customer P. O. Number: --None-- 91
Customer Reference Number:

Fill Date: 2/23/2011
Part Number: EV NIPR15ME-AS
Lot Number: 917105462
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	2/28/2014		NIST Traceable
Cylinder Number:	CC83632		Analytical Uncertainty:
15.1	ppm	PROPANE	± 1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 2/28/2011 *Term:* 36 Months *Expiration Date:* 2/28/2014

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: PROPANE

Requested Concentration: 15 ppm
Certified Concentration: 15.1 ppm
Instrument Used: VARIAN 3300 INST 023 (PROPANE)
Analytical Method: FID
Last Multipoint Calibration: 2/16/2011

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA9284
Ref. Std. Conc: 20.09 PPM
Ref. Std. Traceable to SRM # : 1667b
SRM Sample # : 83-I-52
SRM Cylinder # : XF004079B

First Analysis Data:							Date:	2/28/2011
Z:	0	R:	20.02	C:	15.11	Conc:	15.115	
R:	20.06	Z:	0	C:	15.04	Conc:	15.045	
Z:	0	C:	15.08	R:	20.17	Conc:	15.085	
UOM:	PPM			Mean Test Assay:			15.082 PPM	

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

Analyzed by: John Pabish 03/02/11

Certified by: Ashley Davila

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

PRAXAIR

Praxair Distribution Mid-Atlantic
145 Shimersville Rd.
Bethlehem, PA 18015
Telephone: (610) 317-1608
Facsimile: (610) 758-8382

DocNumber: 000009036

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PDI WHSE BROOKFIELD WI HUB
100 N JANACEK RD
BROOKFIELD WI 530450

Praxair Order Number: 02786031
Customer P. O. Number: --None-- 91
Customer Reference Number:

Fill Date: 2/9/2011
Part Number: EV NIPR25ME-AS
Lot Number: 917104031
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	2/15/2014		NIST Traceable
Cylinder Number:	SGAL1326		Analytical Uncertainty:
25.4	ppm	PROPANE	± 1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 2/15/2011 *Term:* 36 Months *Expiration Date:* 2/15/2014

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: PROPANE

Requested Concentration: 25 ppm
Certified Concentration: 25.4 ppm
Instrument Used: VARIAN 3300 INST 023 (PROPANE)
Analytical Method: FID
Last Multipoint Calibration: 1/17/2011

Reference Standard Type: SRM
Ref. Std. Cylinder #: XF004079B
Ref. Std. Conc: 49.54 PPM
Ref. Std. Traceable to SRM #: 21667a
SRM Sample #:
SRM Cylinder #:

First Analysis Data:							Date:	2/15/2011
Z:	0	R:	49.52	C:	25.32	Conc:	25.363	
R:	49.38	Z:	0	C:	25.32	Conc:	25.363	
Z:	0	C:	25.27	R:	49.47	Conc:	25.313	
UOM:	PPM			Mean Test Assay:			25.346 PPM	

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

Analyzed by: 02/15/11
John Pribish

Certified by: Ashley Davila
Ashley Davila

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PRAXAIR

Praxair Distribution Mid-Atlantic
145 Shimersville Rd.
Bethlehem, PA 18015
Telephone: (610) 317-1608
Facsimile: (610) 758-8382

DocNumber: 000009318

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PDI WHSE BROOKFIELD WI HUB
100 N JANACEK RD
BROOKFIELD WI 530450

Praxair Order Number: 02803669
Customer P. O. Number: --None-- 91
Customer Reference Number:

Fill Date: 2/23/2011
Part Number: EV NIPR45ME-AS
Lot Number: 917105431
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	2/28/2014		NIST Traceable
Cylinder Number:	CC107984		Analytical Uncertainty:
45.4	ppm	PROPANE	± 1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 2/28/2011 *Term:* 36 Months *Expiration Date:* 2/28/2014

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1 . Component: PROPANE

Requested Concentration: 45 ppm
Certified Concentration: 45.4 ppm
Instrument Used: VARIAN 3300 INST 023 (PROPANE)
Analytical Method: FID
Last Multipoint Calibration: 2/16/2011

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA15897
Ref. Std. Conc: 50.24 PPM
Ref. Std. Traceable to SRM # : 1667b
SRM Sample # : 83-I-52
SRM Cylinder # : XF004079B

First Analysis Data:							Date:	2/28/2011
Z:	0	R:	50.38	C:	45.5	Conc:	45.404	
R:	50.3	Z:	0	C:	45.53	Conc:	45.434	
Z:	0	C:	45.51	R:	50.36	Conc:	45.414	
UOM:	PPM			Mean Test Assay:			45.417 PPM	

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

Analyzed by: John Rubish 03/02/11

Certified by: Robin Morgan

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PRAXAIR

Praxair Distribution Mid-Atlantic
145 Shimersville Rd.
Bethlehem, PA 18015
Telephone: (610) 317-1608
Facsimile: (610) 758-8382

DocNumber: 000009462

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PDI WHSE BROOKFIELD WI HUB
100 N JANACEK RD
BROOKFIELD WI 530450

Praxair Order Number: 02830578
Customer P. O. Number: --None-- 91
Customer Reference Number:

Fill Date: 3/3/2011
Part Number: EV NIPR85ME-AS
Lot Number: 917106362
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	3/7/2014		NIST Traceable
Cylinder Number:	SA14615		Analytical Uncertainty:
86.3	ppm	PROPANE	± 1 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 3/7/2011 *Term:* 36 Months *Expiration Date:* 3/7/2014

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1 . Component: PROPANE

Requested Concentration: 85 ppm
Certified Concentration: 86.3 ppm
Instrument Used: VARIAN 3300 INST 023 (PROPANE)
Analytical Method: FID
Last Multipoint Calibration: 2/16/2011

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC205079
Ref. Std. Conc: 99.71 PPM
Ref. Std. Traceable to SRM # : 1667b
SRM Sample # : 83-I-52
SRM Cylinder # : XF004079B

First Analysis Data:						Date:	3/7/2011
Z:	0	R:	99.72	C:	86.49	Conc:	86.421
R:	99.69	Z:	0	C:	86.34	Conc:	86.271
Z:	0	C:	86.22	R:	99.96	Conc:	86.151
UOM:	PPM			Mean Test Assay:			86.281 PPM

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

Analyzed by: 03/09/11
John Pribish

Certified by: 3/8/11
Michelle Kostik

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information con tained herein exceed the fee established for providing such information.

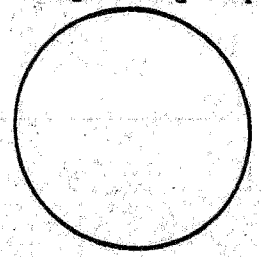
APPENDIX C

Field & Lab Data Sheets

Environmental Technology & Engineering Corp.

PARTICULATE FIELD DATA

γ = 1.009
φ = 0.84



CROSS SECTION

PLANT Mid America
DATE 6-6-14
LOCATION Oak Creek
OPERATOR WD
STACK NO. 1
RUN NO. 1
SAMPLE BOX NO. 1
METER BOX NO. 2

AMBIENT TEMPERATURE 65
BAROMETRIC PRESSURE 29.27
ASSUMED MOISTURE, % 2
PROBE LENGTH, in. 5'
NOZZLE DIAMETER, in. 3/16
STACK DIAMETER, in. 36x54
PROBE HEATER SETTING 250
HEATER BOX SETTING 250

METER ΔH@ 0.726
C FACTOR
PROCESS WEIGHT RATE

ORSAT RESULTS (BAG)
CO2 1.4%
O2 19.1%
CO <0.1%
N2 84

LEAK CHECKS
Pre OK
Pitot OK
or Post <0.12 00
or Pitot @ 3"

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE (in. H_2O)	STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s)		PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O ACTUAL	DESIRED	GAS SAMPLE VOLUME (V_m), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET ($T_{m_{IN}}$), °F	OUTLET ($T_{m_{OUT}}$), F	SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER F	PUMP VACUUM in. Hg gauge	COMM VELOCITY fps
1	093		380	1.20	-	.42		916.00		70	250	40	2½	72
2	37		382	1.35	-	.47		66.4		72	250	40	2½	73
3	40	-.45	385	1.25	-	.44		68.0		74	250	40	2½	73
4	42		385	1.10	-	.39		69.5		75	245	41	2	74
5	41		384	.95	-	.33		70.9		75	240	41	2	74
6	42		380	.90	-	.32		72.2		76	250	41	2	75
7	50/50		380	1.35	-	.47		73.5		79	250	41	2½	74
8	55		375	1.50	-	.53		75.0		80	250	41	3	75
9	55	-.45	376	1.35	-	.47		76.6		82	245	41	2½	75
10	55		375	1.15	-	.40		78.1		85	250	42	2	76
11	00		374	1.05	-	.37		79.5		87	250	42	2	76
12	03		372	1.00	-	.35		80.8		88	245	42	2	75
13	05/05		371	1.30	-	.46		82.1		90	245	42	2½	75
14	10		372	1.40	-	.49		83.6		92	250	42	3	76
15	10	-.50	375	1.35	-	.47		85.1		94	250	43	3	76
16	15		372	1.20	-	.42		86.6		95	250	44	2½	76
17	12		372	1.00	-	.35		88.0		97	250	45	2	77
18	20		370	.95	-	.33		89.4		99	250	45	2	76
19	23/23		360	1.55	-	.54		90.6		101	255	45	3	77
20	25		362	1.60	-	.56		92.2		103	255	45	3	77
21	28	-.90	360	1.35	-	.47		93.7		104	250	45	3½	77
22	30		361	1.25	-	.44		95.2		105	250	45	2	76
23	35		362	1.10	-	.39		96.6		106	250	45	2	76
24	35		362	1.00	-	.35		98.0		107	250	45	2	74
	1638							919.919						

34.19

EPA-R5-2018-002961_0000559

LABORATORY DATA SHEET
PARTICULATE WITH METHOD 202 BACKHALF ANALYSIS

JOB NAME Mid America DATE OF TEST 6-6-14

JOB NO. TEST ENGINEER WJD

RUN NO. 1 STACK Reclam Furnace - Afterburner

SAMPLE BOX 1 FILTER NUMBER 22

BEAKERS: FH Acetone 10 BH MetCl 4 BH Water D

WATER COLLECTED

Impinger No.	Final Wt (g)	Initial Wt (g)	Water Collected (g)
1+2	0	0	0
3	104	100	4
4	2	0	2
Sil Gel	656	646	10
		WATER TOTAL -	16

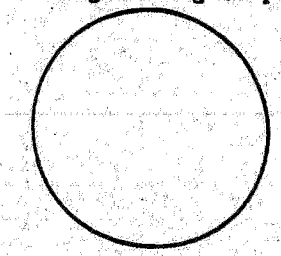
PARTICULATE COLLECTED

	Blank	Final Wt (g)	Tare Wt (g)	Net Wt Gain (g)
Filter	-0-	.3745	.3705	.0040
FH Wash	0.0000	104.2537	104.2435	.0102
			FRONT HALF TOTAL -	.0142
Extract	0.0001	91.9898	91.9850	.0048
Water	0.0001	111.3014	111.3012	.0001
			BACK HALF TOTAL -	.0049
			TOTAL PARTICULATE -	.0191

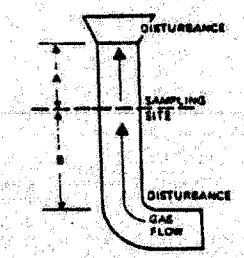
Comments:

Environmental Technology & Engineering Corp.

PARTICULATE FIELD DATA



CROSS SECTION



PLANT Mid America
DATE 6-6-14
LOCATION Oak Creek
OPERATOR WJD
STACK NO. 1
RUN NO. 2
SAMPLE BOX NO. 2
METER BOX NO. 2

AMBIENT TEMPERATURE
BAROMETRIC PRESSURE 29
ASSUMED MOISTURE, % 2
PROBE LENGTH, in. 5 ft
NOZZLE DIAMETER, in. 1/4
STACK DIAMETER, in. 36*54
PROBE HEATER SETTING 250
HEATER BOX SETTING 250

METER ΔH@ See Test 1
C FACTOR
PROCESS WEIGHT RATE

ORSAT RESULTS (Bag)
CO2 1.2%
O2 19.2
CO <0.1
N2 BAL

LEAK CHECKS
Pre ok
Pitot ok
Post <0.1 @ 21"
Pitot ok

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE (in. H_2O)	STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O ACTUAL	DESIRED	GAS SAMPLE VOLUME (Vm), ft³	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET ($T_{m_{IN}}$), °F	OUTLET ($T_{m_{OUT}}$), F	SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER F	PUMP VACUUM in. Hg gauge	COM VELOCITY fps
1	1:10		360	1.40	1.40		7200.00		100	245	43	5	78
2	17		360	1.40	1.40		02.5		101	245	43	5	78
3	15	-.50	359	1.30	1.30		05.1		103	245	44	4	79
4	17		358	1.15	1.15		07.5		105	250	44	4	79
5	20		358	1.05	1.05		09.9		106	250	44	3	79
6	21		357	.95	.95		12.2		107	250	44	3	78
7	25/21		360	1.55	1.55		14.2		109	250	44	5	78
8	25		361	1.35	1.35		16.8		109	250	45	4	78
9	30	-.60	362	1.30	1.30		19.4		110	255	45	4	77
10	35		363	1.15	1.10		22.0		110	255	45	3	79
11	30		362	1.00	1.00		24.2		111	255	46	3	80
12	38		359	.95	.95		26.3		112	250	46	3	80
13	40/41		355	1.45	1.40		28.4		113	250	46	4	80
14	43		352	1.30	1.30		31.0		115	255	46	4	80
15	46	-.60	352	1.20	1.20		33.2		116	255	47	3	79
16	48		353	1.05	1.05		35.5		117	250	47	3	77
17	51		351	1.05	1.05		37.7		118	250	47	3	77
18	53		350	.90	.90		40.0		119	250	47	3	78
19	55/56		350	1.35	1.35		42.0		121	250	47	4	78
20	59		352	1.25	1.25		44.5		122	250	48	4	77
21	01	-.50	354	1.20	1.20		46.9		123	250	49	3	77
22	04		355	1.10	1.10		49.2		123	250	49	3	77
23	06		354	1.00	1.00		51.4		124	250	50	3	78
24	09		351	.90	.90		53.6		124	250	50	3	78
	121130						9255.60						

55.60

EPA-R5-2018-002961_0000559

LABORATORY DATA SHEET
PARTICULATE WITH METHOD 202 BACKHALF ANALYSIS

JOB NAME Mid America Steel Drum DATE OF TEST 6/6/14

JOB NO. _____ TEST ENGINEER WJD

RUN NO. 2 STACK Reclam Furn - Afterburner

SAMPLE BOX 2 FILTER NUMBER 23

BEAKERS: FH Acetone 11 BH MetCl 5 BH Water 6

WATER COLLECTED

Impinger No.	Final Wt (g)	Initial Wt (g)	Water Collected (g)
1 & 2	0	0	0
3	106	100	6
4	1	0	1
Sil Gel	647	638	9
		WATER TOTAL -	16

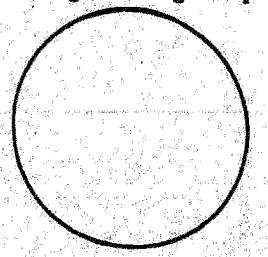
PARTICULATE COLLECTED

	Blank	Final Wt (g)	Tare Wt (g)	Net Wt Gain (g)
Filter	-0-	.3751	.3705	.0046
FH Wash	0.0000	114.3537	114.3415	.0122
			FRONT HALF TOTAL -	.0168
Extract	0.0001	88.2522	88.2456	.0065
Water	0.0001	113.4371	113.4368	.0002
			BACK HALF TOTAL -	.0067
			TOTAL PARTICULATE -	.0235

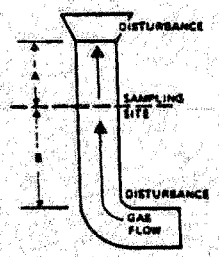
Comments:

Environmental Technology & Engineering Corp.

PARTICULATE FIELD DATA



CROSS SECTION



PLANT: Mid American
DATE: 6-6-14
LOCATION: Oak Creek
OPERATOR: WJD
STACK NO.: 1
RUN NO.: 3
SAMPLE BOX NO.: 3
METER BOX NO.: 2

AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
ASSUMED MOISTURE, %: 2
PROBE LENGTH, in.: 5' +
NOZZLE DIAMETER, in.: 1/4
STACK DIAMETER, in.: 36 x 54
PROBE HEATER SETTING: 250
HEATER BOX SETTING: 250

METER ΔH@: See Test 1
C FACTOR
PROCESS WEIGHT RATE

ORSAT RESULTS (Bag)
CO2 1.2%
O2 19.2
CO <0.1
N2 BAL

LEAK CHECKS
Pre OK
Pitot OK
OK Post <<5, c 22"
OK Pitot c 3' +

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE (in. H_2O)	STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O ACTUAL	DESIRED	GAS SAMPLE VOLUME (Vm), ft³	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (Tm_{IN}), °F	OUTLET (Tm_{OUT}), F	SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER F	PUMP VACUUM in. Hg gauge	VELOCITY fps
1	1235		370	1.45	1.45		925.00		105	245	45	5	75
2	37+		367	1.40	1.40		60.0		105	250	45	5	78
3	40	-0.55	366	1.30	1.30		63.4		106	250	45	4	76
4	42+		365	1.20	1.20		65.8		108	250	46	4	76
5	45		362	1.10	1.10		68.3		108	245	46	3	76
6	47+		360	1.00	1.00		70.4		109	250	46	3	76
7	50/50+		362	1.55	1.55		72.6		110	250	46	5	76
8	53		363	1.45	1.45		75.2		111	250	46	4	76
9	55+	-.60	361	1.30	1.30		77.7		112	250	46	4	77
10	58		360	1.20	1.20		80.2		114	255	47	4	78
11	00+		360	1.10	1.10		82.5		116	250	47	3	78
12	03		360	.95	.95		84.8		116	250	47	3	77
13	05+/06		360	1.45	1.45		86.9		116	255	49	5	77
14	08+		363	1.30	1.30		89.4		117	255	48	4	76
15	11	-.60	365	1.25	1.25		91.8		118	255	48	4	76
16	13+		363	1.25	1.25		94.1		120	255	49	4	76
17	16		362	1.15	1.15		96.5		120	250	49	3	75
18	18+		361	1.05	1.05		98.8		119	250	49	3	75
19	21/21+		362	1.35	1.35		1301.0		120	255	49	4	75
20	24		362	1.30	1.30		03.4		120	250	50	4	76
21	26+	-.60	363	1.20	1.20		05.9		120	250	50	3	76
22	29		362	1.15	1.15		08.3		120	250	50	3	76
23	31+		360	.95	.95		10.5		121	250	51	3	75
24	34		360	.85	.85		12.6		121	250	51	3	75
	133min						93.454						

56.54

EPA-R5-2018-002961_0000559

LABORATORY DATA SHEET
PARTICULATE WITH METHOD 202 BACKHALF ANALYSIS

JOB NAME Mid America Steel Drum DATE OF TEST 6/6/14

JOB NO. _____ TEST ENGINEER WJD

RUN NO. 3 STACK Reclam Furnace - Afterburner

SAMPLE BOX 3 FILTER NUMBER 24

BEAKERS: FH Acetone 12 BH MetCl 6 BH Water F

WATER COLLECTED

Impinger No.	Final Wt (g)	Initial Wt (g)	Water Collected (g)
1+2	0	0	0
3	105	100	5
4	4	0	4
Sil Gel	712	703	9
		WATER TOTAL -	18

PARTICULATE COLLECTED

	Blank	Final Wt (g)	Tare Wt (g)	Net Wt Gain (g)
Filter	-0-	3776	3735	.0041
FH Wash	0.0000	114.9410	114.9314	.0096
			FRONT HALF TOTAL -	.0137
Extract	0.0001	92.5043	92.4972	.0070
Water	0.0001	124.2822	124.2820	.0001
			BACK HALF TOTAL -	.0071
			TOTAL PARTICULATE -	.0208

Comments:

METHOD 25A FIELD SAMPLING DATA

ETE

Client	MID-AMERICA			
Date	6/6/14			
Process	DRUM RECLAM - AFTERBURNER			
Run No.	1 (9:35 - 10:35)			
Methane	In		Out	

PROPANE GAS	High		Mid		Low		Zero	
	In	Out	In	Out	In	Out	In	Out
Initial Calibration	86.1	45.2	45.5	25.4	25.6	15.2	0.0	0.0
Final Calibration			45.7	25.2			0.2↓	0.0
Standard	86.3	45.4	45.4	25.4	25.4	15.1	0	0

↓ = SLOWLY FALLING

MIN	PPM		MIN	PPM		MIN	PPM	PPM
	In	Out		In	Out		In	Out
1	21.6	2.5	21	47.9	2.0	41	35.5	1.6
2	21.1	3.2	22	58.3	2.3	42	36.8	1.8
3	20.8	2.4	23	54.6	2.4	43	31.8	1.3
4	15.1	2.6	24	50.9	2.1	44	12.4	1.5
5	11.5	3.5	25	29.4	1.8	45	14.2	1.3
6	11.6	3.4	26	26.5	1.6	46	21.3	1.2
7	26.5	3.0	27	33.4	1.6	47	28.3	1.4
8	60.3	1.8	28	17.8	1.7	48	37.8	1.3
9	63.2	1.9	29	14.2	1.7	49	64.6	1.6
10	50.6	2.0	30	25.2	1.8	50	61.1	1.4
11	71.7	1.8	31	21.0	1.7	51	44.2	1.3
12	67.1	2.1	32	26.1	1.5	52	43.3	1.3
13	48.4	2.3	33	32.9	1.5	53	36.1	1.2
14	28.2	2.2	34	33.4	1.6	54	33.4	1.6
15	56.2	2.4	35	42.4	1.6	55	14.4	1.3
16	22.3	2.1	36	39.0	1.5	56	21.8	1.3
17	26.7	2.2	37	46.8	1.6	57	53.0	1.3
18	19.4	1.8	38	40.6	1.4	58	18.0	1.3
19	34.5	1.8	39	45.2	1.7	59	17.2	1.9
20	38.6	1.8	40	59.5	1.4	60	12.8	1.5

COMMENTS:

METHOD 25A FIELD SAMPLING DATA

ETE

Client	MID-AMERICA			
Date	6/6/14			
Process	DRUM RECLAM - AFTERBURNER			
Run No.	2 (11:10 - 12:10)			
Methane	In		Out	

PROPANE GAS	High		Mid		Low		Zero	
	In	Out	In	Out	In	Out	In	Out
Initial Calibration			45.7	25.2			0.2	0.0
Final Calibration			45.5	25.6			0.2	0.1
Standard			45.4	25.4			0	0

MIN	PPM In	PPM Out	MIN	PPM In	PPM Out	MIN	PPM In	PPM Out
1	28.7	2.9	21	30.2	1.7	41	52.1	1.2
2	67.7	3.1	22	17.2	1.9	42	48.1	1.1
3	97.8	3.5	23	21.4	1.7	43	81.7	1.5
4	71.0	3.1	24	15.4	1.6	44	83.9	1.2
5	56.4	2.8	25	13.9	1.5	45	27.8	1.0
6	50.3	2.6	26	22.2	1.8	46	76.6	1.4
7	23.5	2.9	27	38.3	1.8	47	78.1	1.0
8	27.9	2.0	28	45.2	1.9	48	70.6	1.0
9	56.6	2.1	29	45.8	1.9	49	65.8	1.4
10	44.6	2.1	30	53.7	1.7	50	75.0	1.1
11	38.8	2.0	31	23.2	1.4	51	57.4	1.1
12	28.1	2.3	32	28.7	1.6	52	58.6	1.4
13	27.8	2.2	33	30.5	1.4	53	54.8	1.0
14	29.5	2.1	34	21.3	1.5	54	59.6	1.6
15	28.7	2.1	35	18.1	1.8	55	52.3	1.2
16	32.1	1.8	36	30.3	2.1	56	56.2	1.0
17	20.1	1.8	37	24.5	2.3	57	75.4	1.1
18	21.8	1.8	38	22.2	1.8	58	90.9	1.3
19	19.5	1.7	39	31.8	1.5	59	86.7	1.3
20	49.2	1.8	40	42.3	1.2	60	83.6	1.1

COMMENTS:

METHOD 25A FIELD SAMPLING DATA

ETE

Client	MID-AMERICA			
Date	6/6/14			
Process	DRUM RECLAM - AFTERBURNER			
Run No.	3 (12:35- 13:35)			
Methane	In		Out	

PROPANE GAS	High		Mid		Low		Zero	
	In	Out	In	Out	In	Out	In	Out
Initial Calibration			45.5	25.6			0.2	0.1
Final Calibration			45.7	25.5			0.3	0.1
Standard			45.4	25.4			0	0

MIN	PPM		MIN	PPM		MIN	PPM	PPM
	In	Out		In	Out		In	Out
1	15.4	1.0	21	39.9	0.4	41	44.0	0.5
2	23.4	0.8	22	42.4	0.4	42	30.6	0.4
3	32.6	0.7	23	44.1	0.4	43	42.2	0.3
4	31.8	0.6	24	32.8	0.3	44	39.9	0.3
5	59.8	0.9	25	36.6	0.2	45	34.1	0.3
6	48.6	0.7	26	43.8	0.4	46	20.5	0.3
7	41.8	0.8	27	50.1	0.4	47	20.6	0.3
8	60.8	0.7	28	45.8	0.4	48	16.3	0.7
9	63.9	0.6	29	69.7	0.4	49	34.0	0.9
10	38.2	0.7	30	73.6	0.4	50	34.1	1.2
11	34.0	0.7	31	32.4	0.3	51	45.5	0.8
12	32.6	0.8	32	59.8	0.4	52	36.4	0.6
13	36.5	0.7	33	62.5	0.5	53	49.3	0.5
14	30.2	0.6	34	66.3	0.3	54	48.6	0.5
15	26.2	0.7	35	30.5	0.3	55	60.4	1.1
16	20.4	0.5	36	22.9	0.4	56	75.0	0.7
17	15.9	0.5	37	19.5	0.6	57	50.7	0.4
18	14.3	0.5	38	19.9	0.4	58	62.2	0.4
19	12.6	0.4	39	20.3	0.4	59	69.2	0.8
20	17.4	0.4	40	13.5	0.3	60	62.2	0.5

COMMENTS:

- NO BARRELS - BOTH IN + OUT REMAINED AROUND 1 PPM (DURING BREAK)
- STEAM BOILER OFF DURING TESTS (STEAM CURTAIN ON, BUT NO EXHAUST AIR TO BOILER)

$T_L = 350°F$

AFTERBURNER ≈ 1700 F

FIELD SAMPLING DATA

Facility MASD
Address
OAK CREEK, WI

Contact 6/6/14 S. SWIERINSKI
Test Date
Witnesses —

Process Description AFTERBURNER INLET (ABOVE FURNACE)
- H_2O CORRECTIONS FOR EPA 25A

Stack Number _____ Analyte (NMHC) Pump # _____

SAMPLING DATA DGM γ = 1.013

Sample ID	Time	Meter Rdg/ Rotameter	~~Flow Rate~~ TM	Minutes	H_2O Volume
AFT IN-1	9:35-	0704.20 l	64F		20.0
	10:35	768.44	66		22.5
		64.24 l	65		+2.5 ml
IN-2	11:10-	768.60 l	66		20.0
	12:10	830.78	68		22.0
		62.18 l	67F		+2.0 ml
IN-3	12:35-	830.80	70		20.0
	13:34	894.45	72		22.5
		63.65 l	71F		+2.5 ml

FLOW DATA

Diam = _____
L x W = _____
Cp = _____
Est Moist _____

Point	Run 1 Del P	Run 1 Del P	Run 2 Del P	Run 2 Del P	Run 3 Del P	Run 3 Del P
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

	Run 1	Run 2	Run 3
Ps			
T			
CO2			
O2			
N2			

COMMENTS _____

ENVIRONMENTAL TECHNOLOGY & ENGINEERING CORP.
13020 West Bluemound Road Elm Grove, Wisconsin 53122
414-784-2434

FIELD SAMPLING DATA

Facility MidAmerica Steel Drum
Address 8570 S Chicago
Oak Creek, WI

Contact Scott S
Test Date 6/6/14
Witnesses

Process Description AFTERBURNER - OUTLET SIDE (NEXT TO 25A PROBE)
- H_2O CORRECTIONS FOR 25A

Stack Number _____ Analyte (NMHC) Pump # _____

SAMPLING DATA

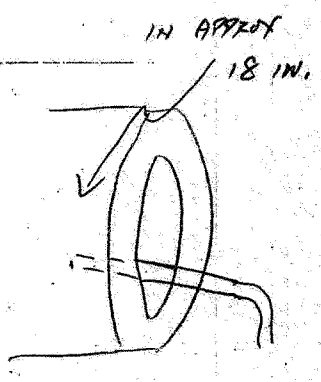
DGM γ = 1.019

Sample ID	Time	Meter Rdg/ Rotameter	Flow ~~Rate~~ T_M	Minutes	Volume
AFT OUT-1	9:35-	6244.50 l	83 F		20.0 ml
	10:35	304.32	85		21.8
		59.82 l	84 F		41.8
OUT-2	11:10-	304.40 l	85		20.0
	12:10	366.95	87		22.0
		62.55 l	86 F		42.0 ml
OUT-3	12:35-	377.00 l	87		20.0
	13:35	431.07	88		22.0
		64.07 l	88 F		42.0 ml

FLOW DATA

Diam = _____
L x W = _____
Cp = _____
Est Moist _____

Point	Run 1 Del P	Run 1 Del P	Run 2 Del P	Run 2 Del P	Run 3 Del P	Run 3 Del P
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						



	Run 1	Run 2	Run 3
Ps			
T			
CO2			
O2			
N2			

COMMENTS _____

ENVIRONMENTAL TECHNOLOGY & ENGINEERING CORP.
13020 West Bluemound Road Elm Grove, Wisconsin 53122
414-784-2434

Environmental Technology & Engineering Corp

June 9, 2014

Mike Huenink
ETE Corp

Date Received: June 7, 2014
Re: ETE Project No. 4232

LAB ANALYSIS REPORT

Sample ID	Methane Results (1)	Minimum Det. Limit	Comments
Aft In-1	14.5 ppm (as C_3H_8)	0.1 ppm	
Aft In-2	17.2 ppm (as C_3H_8)	0.1 ppm	
Aft In-3	16.1 ppm (as C_3H_8)	0.1 ppm	
Aft Out-1	1.2 ppm (as C_3H_8)	0.1 ppm	
Aft Out-2	1.4 ppm (as C_3H_8)	0.1 ppm	
Aft Out-3	0.2 ppm (as C_3H_8)	0.1 ppm	
Blank-6/7	< 0.1 ppm (as C_3H_8)	0.1 ppm	

Note: (1) All results reported in parts per million, as propane (levels reported from comparison to propane gas standards)

Analytical Methods: EPA 18 (integ. bag samples, Chr. 102 column, GC-FID)
Standards: 0, 15.1, 25.4, 45.4 ppm (propane)

MJH

Michael J. Huenink, Analyst

ETE
13000 Bluemound Road *Elm Grove, Wisconsin 53122-2655*
Phone: (262) 784-2434 *Fax: (262) 784-2436*

Mid-America Steel Drum - Oak Creek, WI
Afterburner (Drum Recl) VOC Testing
METHOD 4 RESULTS - MOISTURE PERCENT

Test Date	Location/ Test	Meter Vol. liters	Meter Vol. ft3	Meter Temp deg F	Standard Vol FT3	Water Captured ml	Water Volume ft3	Total Volume ft3	Percent Water % Vol
6/6/2014	In - 1	64.24	2.268	65	2.263	2.5	0.118	2.38	5.0
	In - 2	62.18	2.196	67	2.182	2.0	0.094	2.28	4.1
	In - 3	63.65	2.247	71	2.217	2.5	0.118	2.33	5.1
								AVG -	**4.7**
	Out - 1	59.82	2.112	84	2.046	1.8	0.085	2.13	4.0
	Out - 2	62.55	2.209	86	2.131	2.0	0.094	2.23	4.2
	Out - 3	64.07	2.262	88	2.175	2.0	0.094	2.27	4.2
								AVG -	**4.1**

Meter Gammas: 1.013 (Inlets) 1.019 (Inlets)
Barom. Pressure: 29.30

Calculations

Meter Vol. (ft3) = Meter Vol. (liters) * 0.03531
Standard Volume = Meter Vol * Meter Gama*Bar.Pressure*528/(29.92*(460+Meter Temp))
Water Volume = .0472 * Water Captured (ml.)
Total Volume= Water Volume + Standard Volume
Percent Water = Water Volume/Total Volume x 100%

APPENDIX D

Example Calculations for Particulate Test Results

SAMPLE PARTICULATE CALCULATION SHEET

TEST NO.	Sample	
BAROMETRIC PRESSURE (Pb)	29.45	IN HG
TIP DIAMETER (d)	0.305	IN
STACK DIAMETER (D)	72	IN
STACK AREA (As=PI*D^2/576)	28.274	FT2
SAMPLING TIME PER POINT	2.5	MIN
NUMBER OF POINTS	24	
METER VOLUME (Vm)	66.53	FT3
PITOT COEFFICIENT (cp)	0.84	
METER COEFFICIENT (GAMA)	0.990	
PARTICULATE COLLECTED (Mn)	0.0500	GRAMS
WATER COLLECTED (Vf-Vi)	32	ML
STATIC PRESSURE (Ps)	-0.5	IN H2O

ORSAT RESULTS

CO2	O2	CO	N2
6.40%	13.40%	0.00%	80.20%

POINT	STACK TEMP DEG F	DELTA P IN H2O	ORIFICE DEL P IN H2O	METER TEMP DEG F	VELOCITY AFPS
1	275	0.32	2.20	35	37.52
2	280	0.37	2.55	38	40.48
3	278	0.37	2.55	40	40.42
4	278	0.40	2.80	41	42.03
5	280	0.50	3.50	43	47.05
6	281	0.70	4.90	44	55.71
7	282	0.72	5.00	44	56.54
8	280	0.72	5.00	44	56.46
9	280	0.62	4.30	45	52.40
10	277	0.57	3.90	46	50.14
11	276	0.65	4.50	47	53.50
12	275	0.60	4.20	48	51.37
13	282	0.70	4.90	50	55.75
14	283	0.82	5.70	53	60.38
15	282	0.85	6.00	56	61.43
16	283	0.75	5.20	60	57.74
17	280	0.59	4.10	62	51.11
18	280	0.60	4.20	65	51.54
19	280	0.60	4.20	67	51.54
20	278	0.65	4.50	70	53.58
21	279	0.72	5.00	72	56.43
22	280	0.72	5.00	74	56.46
23	277	0.65	4.50	75	53.54
24	275	0.30	2.10	75	36.32
AVERAGE	279 (Tsavg)		4.20 (DELH)	54 (Tm)	51.23 (vsavg)

DRY STANDARD VOLUME (Vmstd)	65.51	SCF
PERCENT WATER VAPOR %H2O)	2.25	% VOL
FLOW RATE (Q)	86905	ACFM
	59651	DSCFM
	101360	M3/HR
PARTICULATE CONCENTRATION (cs)	0.0118	GR/DSCF
PARTICULATE EMISSION RATE (ER)	6.08	LB/HR
LB PART PER 1000 LB GAS (EC)	0.0219	
ISOKINETIC PERCENT (I)	102.0	

PARTICULATE SAMPLE CALCULATION FORMULA

1. **DRY MOLECULAR WEIGHT (Md)** lb/lb-mole

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

2. **WATER VAPOR PERCENT (%H2O)**

Vw std = 0.04707*(Vf - Vi)

where: Vw std = standard cubic feet of water vapor
Vf = Final volume of impingers, ml
Vi = Initial volume of impingers, ml

%H2O = Vw std * 100/(Vm std + Vw std)

where Vm std = standard cubic feet of gas sampled

3. **WET MOLECULAR WEIGHT (Ms)** lb/lb-mole

Ms = Md*(1 - %H2O/100) + 18*%H2O/100

4. **STACK PRESSURE (Ps)** in. Hg.

Ps = Pb + Pg/13.6

where: Pb = barometric pressure (uncorrected), in. Hg
Pg = stack gauge pressure, in. H2O
13.6 = specific gravity of mercury (Hg)

5. **AVERAGE STACK VELOCITY (vs)** feet per second

Vs = Kp*Cp*DELP * (Tsavg/(Ps*Ms))^0.5

where: Kp = 85.49 unit conversion
Cp = 0.84, pitot tube calibration factor
DELP = average of square root of velocity head, in. H2O
Tsavg = average stack temperature, deg R (460+F)
Ps = stack pressure
Ms = wet molecular weight

6. **STACK GAS FLOW RATE (Qs)** std. cubic feet per minute

Qs = 60*(1 - %H2O/100)*Vs*A*(528*Ps/Tsavg/29.92)

where: A = stack area, ft2
528 = std temperature, deg R
29.92 = std pressure, in. Hg

7. **DRY GAS VOLUME (Vmstd)** dry std. cubic feet

Vm std = (GAMAC*(Pb+ DELH/13.6)/29.92) * Vm

where: GAMAC = dry gas meter calibration factor corrected for meter temperature (GAMA+(Tm-70)*.00012)
Vm = volume of dry gas metered, cubic feet
Tm = average meter temperature, degrees F
DELH = average orifice pressure drop, in.H2O

8. **PARTICULATE CONCENTRATION (cs)** grains per dry standard cubic foot

Cs = Mn * 15.43/Vm std
where: Mn = particulate captured, grams
15.43 = grains per gram

9. **EMISSION RATE (ER)** pounds per hour

PMRA = Mn*A*60/(t*An*453.6) AREA METHOD lb/hr

PMRC = Cs*Qs*60/(15.43*453.6) CONC. METHOD lb/hr

ER = (PMRA + PMRC)/2

where: An = area of sampling nozzle, square feet

10. **EMISSION CONCENTRATION (EC)** lb/1000 lb exhaust gas

EC = ER * 386700 * (1-%H2O/100)/(Qs*60*Ms)

where: 386700 = cubic feet per lb mole * 1000

11. **ISOKINETIC SAMPLING PERCENTAGE (I)**

I = PMRA/PMRC