7 APPENDICES

A. Source Emissions Calculations
B. Field Data
C. Calibration Data
D. Analytical Data
E. Unit Operational Data
F. Chain of Custody Records
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NOMENCLATURE FOR PARTICULATE CALCULATIONS

Symbol	English Units	Metric Units	Description
A_s	$in.^2$	m^2	Stack Area
C_{an}	gr/dscf*	g/dscm*	Particulate - probe, cyclone, and filter
C_{ao}	gr/dscf*	g/dscm*	Particulate - total
C_{at}	gr/CF @ stack conditions	g/m^3	Particulate - probe, cyclone, and filter
C_{au}	gr/CF @ stack conditions	g/m^3	Particulate - total
C_{aw}	lbs/hr	kg/hr	Particulate - probe, cyclone, and filter
C_{ax}	lbs/hr	kg/hr	Particulate - total
C_p			Pitot Tube Calibration Factor
D_n	in.	m	Sampling Nozzle Diameter
%EA			Percent Excess Air at sampling point
g	32.174 ft/sec^2		Acceleration of Gravity
%I			Percent Isokinetic
%M			Percent Moisture in the stack gas by volume
M_d			Mole fraction of dry gas

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

Symbol	English Units	Metric Units	Description
m_f	mg	mg	Particulate - probe, cyclone, and filter
M_{water}	18 lb/lb-mole		Molecular Weight of water
m_t	mg	mg	Particulate - total
MW	lb/lb-mole	g/g-mole	Molecular Weight of stack gas
MW_{air}	28.96 lb/ lb-mole		Molecular Weight of air
MW_d	lb/lb-mole	g/g-mole	Molecular Weight of dry stack gas
P_b	"Hg Absolute	mm Hg	Barometric Pressure
P_m	"H_2O	mm H_2O	Orifice Pressure drop
P_s	"Hg Absolute	mm Hg	Stack Pressure
ΔP	"H_2O	mm H_2O	Velocity Head of stack gas
P_{std}	29.92 "Hg	760 mm Hg	Standard Barometric Pressure
Q_a	ACFM	m^3/hr	Stack Gas Volume at actual stack conditions
Q_s	DSCFM*	dscm/hr*	Stack Gas Volume at 29.92 "Hg, 528°R, dry
R	21.83 "Hg-ft^3/lb-mole°R		Universal Gas Constant
T_m	°F	°C	Average Gas Meter Temperature

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

Symbol	English Units	Metric Units	Description
T_t	min	min	Net time of test
T_s	°F	°C	Stack Temperature
T_{std}	528°R	293°K	Standard Temperature
V_m	ft^3	m^3	Volume of dry gas sampled @ meter conditions
Vm_{std}	dscf*	dscm*	Volume of dry gas sampled @ standard conditions
V_s	fpm	m/sec	Stack velocity @ stack conditions
V_w	ml	ml	Total water collected in impingers and silica gel
Vw_{gas}	scf*	scm*	Volume of water vapor collected @ standard conditions
ρ_{air}	0.0752 lbs/ft^3		Density of Air
ρ_{water}	1 g/ml		Density of Water
ρ_{man}	62.32 lbs/ft^3		Density of Manometer Oil

Standard Conditions: 29.92 "Hg, 68°F (760 mm Hg, 20°C)

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

METCO ENVIRONMENTAL

EXAMPLE CALCULATIONS

1. Volume of dry gas sampled at standard conditions.*

$$Vm_{std} = Vm \left(\frac{T_{std}}{T_m + 460} \right) \left[\frac{P_b + \frac{P_m}{13.6}}{P_{std}} \right]$$

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460} \right] = dscf$$

$$Vm_{std} = dscf \times 0.028317 = dscm$$

2. Volume of water vapor collected at standard conditions.*

$$Vw_{gas} = \frac{(V_w - gms\ SO_2 - gms\ H_2S)\ \rho_{water}\ R\ T_{std}}{P_{std}\ M_{water}\ 453.6}$$

$$Vw_{gas} = 0.0472\ (V_w - gms\ SO_2 - gms\ H_2S) = scf$$

$$Vw_{gas} = scf \times 0.028317 = scm$$

3. Percent moisture in stack gas.

$$\%M = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \%$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

4. Mole fraction of dry gas.

$$M_d = \frac{100 - \%M}{100}$$

5. Average molecular weight of dry stack gas.

$$MW_d = \left[\%CO_2 \times \frac{44}{100}\right] + \left[\%O_2 \times \frac{32}{100}\right] + \left[\%N_2 \times \frac{28}{100}\right] + \left[\%CO \times \frac{28}{100}\right] = lb/lb\text{-}mole$$

$$= g/g\text{-}mole$$

6. Molecular weight of stack gas.

$$MW = MW_d \times M_d + 18\ (1 - M_d) = \frac{lb}{lb\text{-}mole} = g/g\text{-}mole$$

7. Percent excess air at sampling point.

$$\%EA = \frac{100\ [\%O_2 - (0.5\ \%CO)]}{0.265\ (\%N_2) - [\%O_2 - (0.5\ \%CO)]}$$

8. Stack Pressure.

$$P_s = P_b + \frac{Stack\ Pressure\ "H_2O}{13.6} = "Hg\ Absolute$$

$$P_s = "Hg\ Abs. \times 25.4 = mm\ Hg$$

9. Stack velocity at stack conditions.

$$V_s = C_p\ 60 \left[\frac{2g \times \rho_{man} \times P_{std} \times MW_{air} \times (T_s + 460) \times \Delta P_s}{12 \times \rho_{air} \times P_s \times MW \times T_{std}} \right]^{1/2}$$

$$V_s = 5{,}123.8\ C_p \left[\frac{(T_s + 460)}{P_s \times MW} \right]^{1/2} \sqrt{\Delta P}\ average = fpm$$

$$V_s = fpm \times 0.00508 = m/\text{sec}$$

10. Dry stack gas volume at standard conditions.*

$$Q_s = \frac{1}{144}\ V_s \times A_s \times M_d \times \frac{T_{std}}{T_s + 460} \times \frac{P_s}{P_{std}}$$

$$Q_s = \frac{0.123\ V_s \times A_s \times M_d \times P_s}{T_s + 460} = DSCFM$$

$$Q_s = DSCFM \times 1.6990 = dscm/hr$$

11. Actual stack gas volume at stack conditions.

$$Q_a = \frac{V_s \times A_s}{144} = ACFM$$

$$Q_a = ACFM \times 1.6990 = m^3/hr$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

12. Percent isokinetic.

$$\%I = \frac{Vm_{std} \times (T_s + 460) \times P_{std} \times 100 \times 144\ in^2/ft^2}{M_d \times T_{std} \times P_s \times T_t \times V_s \left(\frac{\pi \times D_n^2}{4}\right)}$$

$$\%I = \frac{1039 \times Vm_{std} \times (T_s + 460)}{M_d \times P_s \times T_t \times V_s \times D_n^2}$$

13. Particulate - probe, cyclone, and filter.

$$C_{an} = \frac{m_f}{Vm_{std}} \times \frac{1\ gr}{64.8\ mg}$$

$$C_{an} = 0.0154 \times \frac{m_f}{Vm_{std}} = gr/dscf*$$

$$C_{an} = gr/dscf \times 2.290 = g/dscm*$$

14. Particulate total.

$$C_{ao} = 0.0154 \times \frac{m_t}{Vm_{std}} = gr/dscf*$$

$$C_{ao} = gr/dscf \times 2.290 = g/dscm*$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

15. Particulate - probe, cyclone, and filter at stack conditions.

$$C_{at} = C_{an} \times \frac{P_s}{P_{std}} \times \frac{(T_{std})}{(T_s + 460)} \times M_d$$

$$C_{at} = \frac{17.65 \times C_{an} \times P_s \times M_d}{T_s + 460} = gr/CF$$

$$C_{at} = gr/CF \times 2.290 = g/m^3$$

16. Particulate - total, at stack conditions.

$$C_{au} = \frac{17.65 \times C_{ao} \times P_s \times M_d}{T_s + 460} = gr/CF$$

$$C_{au} = gr/CF \times 2.290 = g/m^3$$

17. Particulate - probe, cyclone, and filter.

$$C_{aw} = C_{an} \times Q_s \times \frac{60 \text{ min}}{1 \ hr} \times \frac{1 \ lb}{7000 \ gr}$$

$$C_{aw} = 0.00857 \times C_{an} \times Q_s = lbs/hr$$

$$C_{aw} = lbs/hr \times 0.4536 = kg/hr$$

18. Particulate - total.

$$C_{ax} = 0.00857 \times C_{ao} \times Q_s = lbs/hr$$

$$C_{ax} = lbs/hr \times 0.4536 = kg/hr$$

19. Mercury – ug/dscm

ug/dscm = ug ÷ (Vm_{std} x 0.028317m^3/ft^3)

20. Mercury – lbs/10^{12} Btu

lbs/10^{12} Btu = ug ÷ Vm_{std} x (2.205 x 10^{-9} lbs/ug) x F_d x [20.9 ÷ (20.9 – O_2)] x (1.0 x 10^6)

F_d = Oxygen based F factor of 9,780 dscf*/million Btu

* 29.92 "Hg, 68 °F (760 mm Hg, 20 °C)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER:	99-95WHS1
JOB NAME:	FIRSTENERGY
LOCATION:	STRATTON, OH
UNIT TESTED:	UNIT NUMBER 1 BAGHOUSE INLET DUCT

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			09/23/99	09/24/99	09/24/99
BEGIN TIME			1601	0745	1145
END TIME			1902	1015	1427
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.06 (738)	29.03 (737)	29.05 (738)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.571 (14.5)	0.554 (14.1)	0.518 (13.2)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	64.811 (1.835)	65.709 (1.861)	64.563 (1.828)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	81 (27.00)	64 (18.00)	77 (25.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	61.535 (1.742)	64.342 (1.822)	61.726 (1.748)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	85.2	97.9	97.7
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	4.021 (0.114)	4.621 (0.131)	4.611 (0.131)
%M	MOISTURE IN STACK GAS BY VOLUME	%	6.13	6.70	6.95

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

FIRSTENERGY
STRATTON, OH
UNIT NUMBER 1 BAGHOUSE INLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.9387	0.9330	0.9305
CO2		%	13.0	13.2	13.2
O2		%	6.0	6.0	6.0
CO		%	0.0	0.0	0.0
N2		%	81.0	80.8	80.8
%EA	EXCESS AIR @ SAMPLING POINT	%	38.8	38.9	38.9
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.32 (30.32)	30.35 (30.35)	30.35 (30.35)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.56 (29.56)	29.52 (29.52)	29.49 (29.49)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	1.134 (28.8)	1.101 (28.0)	1.036 (26.3)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	322 (161)	314 (157)	313 (156)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	28.24 (717)	28.18 (716)	28.19 (716)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	4,259 (21.64)	4,193 (21.30)	4,063 (20.64)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	24,507 (15.81)	24,507 (15.81)	24,507 (15.81)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	435,199 (739,403)	429,340 (729,449)	415,599 (706,103)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	724,862 (1,231,541)	713,533 (1,212,293)	691,486 (1,174,835)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SOURCE EMISSION CALCULATIONS

FIRSTENERGY
STRATTON, OH
UNIT NUMBER 1 BAGHOUSE INLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	150	150	150
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.175 (0.004)	0.175 (0.004)	0.175 (0.004)
%I	PERCENT ISOKINETIC	%	96.4	102.2	101.3
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER: 99-95WHS1
JOB NAME: FIRSTENERGY
LOCATION: STRATTON, OH
UNIT TESTED: UNIT NUMBER 1 BAGHOUSE SOUTH OUTLET DUCT

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			09/23/99	09/24/99	09/24/99
BEGIN TIME			1555	0742	1145
END TIME			1904	1017	1420
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.06 (738)	29.03 (737)	29.05 (738)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.685 (17.4)	0.675 (17.1)	0.652 (16.6)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	70.286 (1.990)	67.671 (1.916)	66.430 (1.881)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	80 (27.00)	62 (17.00)	77 (25.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	66.876 (1.894)	66.537 (1.884)	63.533 (1.799)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	100.8	114.9	121.0
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	4.758 (0.135)	5.423 (0.154)	5.711 (0.162)
%M	MOISTURE IN STACK GAS BY VOLUME	%	6.64	7.54	8.25

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SOURCE EMISSION CALCULATIONS

FIRSTENERGY
STRATTON, OH
UNIT NUMBER 1 BAGHOUSE SOUTH OUTLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.9336	0.9246	0.9175
CO2		%	12.0	12.4	12.6
O2		%	7.1	6.8	7.0
CO		%	0.0	0.0	0.0
N2		%	80.9	80.8	80.4
%EA	EXCESS AIR @ SAMPLING POINT	%	49.5	46.5	48.9
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.20 (30.20)	30.26 (30.26)	30.30 (30.30)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.39 (29.39)	29.33 (29.33)	29.28 (29.28)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	1.352 (34.3)	1.265 (32.1)	1.227 (31.2)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	308 (153)	300 (149)	302 (150)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	27.68 (703)	27.70 (704)	27.73 (704)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	4,662 (23.68)	4,493 (22.82)	4,428 (22.49)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	11,324 (7.31)	11,324 (7.31)	11,324 (7.31)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	218,496 (371,225)	210,893 (358,307)	205,927 (349,870)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	366,625 (622,896)	353,301 (600,258)	348,199 (591,590)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SOURCE EMISSION CALCULATIONS

FIRSTENERGY
STRATTON, OH
UNIT NUMBER 1 BAGHOUSE SOUTH OUTLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	150	150	150
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.175 (0.004)	0.175 (0.004)	0.175 (0.004)
%I	PERCENT ISOKINETIC	%	96.4	99.4	97.2
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

APPENDIX B

Field Data

METCO ENVIRONMENTAL

Job Number 99-95 WHS 1 ✓
Job Name EPRI ✓
Run Number 1 ✓
Unit #1 Inlet Duct ✓
Date 9-23-99 ✓
Operator Bass / Brown / Hefley ✓
Sample Box No. Hg-1 Meter Box No. 27-2 ✓

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 80
Assumed Moisture % 7.
Probe Length 14'
C Factor 10 to 1.55 to reference
Initial Leak @ 15.00 "Hg = ~~0.004~~ cfm 0.001
Final Leak @ 12.00 "Hg = 0.002 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
~~A6~~	~~15~~	~~024.951~~						~~250~~	~~304~~	~~57~~				Q1 thimble
		~~025.398~~												47Q25 back filter
A5	1601	026.637	0.92	0.46	0.46	6.50	311	250	291	68	79	80	288	
4	1606	028.62	1.40	0.71	0.71	7.75 ~~8.75~~	319	251	286	67	80	80	286	initial orset
3	1611	031.04	1.60	0.80	0.80	8.75	325	252	279	65	81	80	284	pump off 1613-1644
2	1644	031.754	1.20	0.60	0.60	7.00	320	250	290	50	81	81	278	(lost power)
1	1647	033.07	1.29 ~~1.40~~	~~0.71~~ 0.60	0.60 ~~0.71~~	7.75	315	252	277	48	81	81	285	
1	1652	035.60	1.40	0.71	0.71	7.75	314	254	260	46	81	81	259	
BS ~~End~~	1657	037.21	1.05	0.52	0.52	7.00	~~315~~	250	294	46	~~82~~	81	265	
4	1702	039.79	1.50	0.76	0.76	8.75	323	251	298	45	82	81	274	
3	1707	041.77	1.60	0.80	0.80	9.25	329	255	271	46	82	81	284	
2	1712	044.36	1.40	0.71	0.71	8.25	325	252	262	44	82	81	282	
1	1717	046.85	1.20	0.60	0.60	7.50	326	253	279	45	82	81	275	
CS	1722	048.02	1.05	0.52	0.52	7.25	318	252	299	46	82	81	270	
4	1727	050.80	1.20	0.60	0.60	7.75	324	255	298	46	82	81	271	
3	1732	053.02	1.00	0.50	0.50	7.00	329	253	266	46	82	81	279	
2	1737	055.13	1.30	0.66	0.66	8.25	328	251	274	46	82	81	287	
1	1742	057.42	1.40	0.71	0.71	8.50	324	251	260	46	82	81	288	

Pitot Tube Calibration Factor C_p 0.811 ✓
Volume Collected V_m 64.81~~01~~ ✓ ft^3
Water Collected V_w 85.2 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s -11.20 ✓ "H_2O

Pitot Tube No. M7 ✓
Baro. Press. P_b 29.02 ✓ "Hg
Probe Tip Dia. D_n 0.175 ✓ in.
% CO_2 13.0 ✓ % CO 0.0 ✓
% O_2 6.0 ✓ % N_2 81.0 ✓
Area Stack A_s 24507 in^2

Barometer No. ~~19-2~~ 19-1 ✓
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 62.984 X 1.029 ✓

Probe Tip No. TFE1-6 ✓

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. HG-1

Impinger 1	Final Weight	982.3 ~~715.0~~ MR	
	Initial Weight	732.3	
	Increase	56.1	
Impinger 2	Final Weight	768.0	
	Initial Weight	755.7	
	Increase	12.3	
Impinger 3	Final Weight	744.4	
	Initial Weight	742.3	
	Increase	2.1	
Impinger 4	Final Weight	773.0	
	Initial Weight	768.4	
	Increase	4.6	
Impinger 5	Final Weight	753.5	
	Initial Weight	753.3	
	Increase	0.2	
Impinger 6	Final Weight	711.6	
	Initial Weight	655.5	
	Increase	56.1	
Impinger 7	Final Weight	701.8	
	Initial Weight	760.0	
	Increase	-58.2	

Water Weight Gain

Imp. 8
Final 960.4
Initial 948.4

V_w =
g SO_2 = -
V_w =

Impinger 1	56.1
Impinger 2	12.3
Impinger 3	2.1
Impinger 4	4.6
Impinger 5	0.2
Impinger 6	56.1
Impinger 7	-58.2
Impinger 8	12.0
Total	85.2 = V_w

P_b =	29.06	$\%CO_2$ =	13.0
V_m =	64.810	$\%O_2$ =	6.0
V_w =	85.2	%CO =	0.0
P_m =	0.571	$\%N_2$ =	81.0
Avg ΔP =	1.134	A_s =	24507
		D_n =	0.175
Avg$\sqrt{\Delta P}$ =	1.059	T_t =	150
C_p =	0.811		
P_s =	-11.20 "H_2O		28.24 "Hg
T_m =	81 °F		541 °R
T_s =	322 °F		782 °R

Moisture Content: %M = 6.13 M_d = 0.9387 MW_d = 30.320 MW = 29.56

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times \cancel{64.810}\ 64.81 \left[\frac{29.06 + \frac{0.571}{13.6}}{81 + 460}\right] = 61.534\ sft^3 = 0.410\ scfm$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 85.2 = 4.021 sft^3

$$\%\ Moisture = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{4.021}{61.534 + 4.021} \times 100 = 6.13\ \%$$

$$V_s = 5123.8 \times 0.811 \sqrt{\frac{782}{28.24 \times 29.56}} \times 1.059 = \cancel{4576}\ 4259\ MR\ fpm$$

ACFM: 724862

SCFM: 435199

$$\%I = \frac{1{,}039 \times 61.534 \times 782}{28.24 \times 0.9387 \times \cancel{4576}\ 4259 \times 150 \times (0.175)^2} = 96.4\ \%$$

%EA: 38.8

Run Number 8 1

Unit #1 Inlet Duct

Date 9-23-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
D5	1747	059.72	0.94	0.48	0.48	7.00	315 ~~250~~	250	275	49	82	81	292	
4	1752	061.29	0.92	0.46	0.46	7.00	323	253	292	48	82	81	295	
3	1757	063.37	1.20	0.60	0.60	7.75	326	253	304	48	83	81	294	
2	1802	065.57	1.20	0.60	0.60	7.75	328	252	306	49	83	82	296	
1	1807	067.91	1.20	0.60	0.60	8.00	324	250	300	48	83	82	294	
E5	1812	069.98	0.65	0.36	0.36	7.00	319	250	290	49	83	82	290	
4	1817	071.42	0.85	0.42	0.42	7.25	322	252	288	49	83	82	281	
3	1822	073.41	0.80	0.40	0.40	7.25	329	250	281	49	83	82	284	
2	1827	075.52	1.20	0.60	0.60	8.50	329	253	284	50	82	82	278	
1	1832	077.59	1.00	0.50	0.50	8.25	328	251	270	48	81	81	275	
F5	1837	079.91	0.80	0.40	0.40	7.25	320	255	272	49	81	81	274	
4	1842	081.22	0.94	0.48	0.48	8.00	320	256	280	49	82	81	289	
3	1847	083.34	0.98	0.50	0.50	8.25	321	251	289	50	81	81	293	
2	1852	085.29	1.10	0.56	0.56	8.50	319	252	287	50	81	81	297	
1	1857	087.42	0.94	0.48	0.48	8.25	319	254	281	51	81	81	284	
END	1902	089.621	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 WHS 1
Job Name EPRI
Run Number 3
Unit Unit 1 Baghouse Inlet Duct
Date 9-24-99
Operator Bass / Brown / Hefley
Sample Box No. Hg 3 Meter Box No. 27-2

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 57
Assumed Moisture % 7
Probe Length 14'
C Factor 1.0 to 1.55 to reference
Initial Leak @ 15.00 "Hg = 0.000 cfm
Final Leak @ 18.00 "Hg = 0.001 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
A5	0745	105.053	1.00	0.50	0.50	7.00	302	250	294	44	61	62	286	thimble Q2
4	0750	107.03	1.30	0.66	0.66	8.00	304	254	306	41	62	62	288	backup filter 47Q28
3	0755	109.34	1.50	0.76	0.76	9.00	309	252	286	41	62	62	293	int. orsat
2	0800	111.86	1.30	0.66	0.66	8.50	307	251	276	39	62	62	295	EDT
1	0805	114.23	1.10	0.55	0.55	8.00	306	253	272	39	62	62	280	
B5	0810	116.32	1.10	0.55	0.55	8.00	308	252	272	40	62	62	271	
4	0815	118.44	1.30	0.66	0.66	9.50	318	251	275	40	62	62	274	
3	0820	120.67	1.40	0.71	0.71	10.50	323	255	275	40	62	62	281	
2	0825	123.11	1.30	0.66	0.66	10.50	322	253	276	41	63	62	286	
1	0830	125.47	1.20	0.60	0.60	10.00	317	254	276	41	63	62	292	
C5	0835	127.63	1.00	0.50	0.50	9.50	313	253	277	41	63	62	294	
4	0840	129.64	1.20	0.60	0.60	11.00	316	255	279	41	63	62	298	
3	0845	131.86	1.10	0.55	0.55	11.00	321	252	278	41	63	62	299	
2	0850	134.04	1.20	0.60	0.60	11.50	320	251	280	42	64	62	299	
1	0855	136.28	1.25	0.63	0.63	12.50	317	256	280	42	64	62	261	
D5	0900	138.54	1.00	0.50	0.50	11.00	311	254	279	43	64	62	263	
4	0905	140.49	0.90	0.46	0.46	11.00	316	254	278	43	64	63	281	
3	0910	142.48	1.15	0.58	0.58	13.00	320	253	279	44	64	63	285	

Pitot Tube Calibration Factor C_p 0.811
Volume Collected V_m 65.709 ft^3
Water Collected V_w ~~90.5~~ 97.9 ml
Time of Test T_t 150 min.
Stack Pressure P_s -11.6 "H_2O

Pitot Tube No. M7
Baro. Press. P_b 29.03 "Hg
Probe Tip Dia. D_n 0.175 in.
% CO_2 13.2 % CO 0.0
% O_2 6.0 % N_2 80.8
Area Stack A_s 2450.7 in^2

Barometer No. 19-1 Probe Tip No. TFE 1-6
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 63.857 X 1.029

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Run Number 2

Unit #1 Inlet Duct

Date 9-24-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	P_m Pump Vacuum "Hg Guage	T_s Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	T_m Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
D2	0915	144.66	1.05	0.53	0.53	13.00	321	255	278	43	65	63	291	
1	0920	146.80	0.98	0.49	0.49	13.00	320	254	279	44	65	63	295	
E5	0925	148.60	1.05	0.53	0.53	13.00	311	253	280	45	66	63	299	
4	0930	150.80	0.78	0.39	0.39	12.50	316	254	281	45	66	64	300	
3	0935	152.79	1.10	0.55	0.55	14.00	319	254	282	46	67	64	299	
2	0940	154.80	1.15	0.58	0.58	15.50	319	255	282	45	67	65	300	
1	0945	157.01	1.05	0.53	0.53	15.00	315	253	287	46	67	65	259	
F5	0950	159.06	0.95	0.48	0.48	14.50	311	254	282	46	67	65	271	
4	0955	161.00	0.85	0.43	0.43	14.50	311	254	280	46	68	65	280	
3	1000	162.91	0.92	0.46	0.46	15.50	312	253	282	46	68	65	288	
2	1005	164.88	0.95	0.48	0.48	16.00	313	253	282	46	69	66	292	
1	1010	166.92	0.90	0.45	0.45	16.00	311	251	281	46	69	66	295	
END	1015	168.910	—	—	—	—	—	—	—	—	—	—	—	Blank Train 0743 - 1000

METCO ENVIRONMENTAL

Job Number 99-95WHS1 ✓
Job Name EPRT ✓
Run Number 3 ✓
Unit Unit 1 Baghouse Inlet Duct ✓
Date 9-24-99 ✓
Operator Bass/Brown/Hefley ✓
Sample Box No. Hg1 Meter Box No. 27-2 ✓

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 73
Assumed Moisture % 6
Probe Length 14'
C Factor 10 to 1.55 to reference
Initial Leak @ 15.00 "Hg = 0.002 cfm
Final Leak @ 22.00 "Hg = 0.004 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
A5	1145	173.301	1.00	0.50	0.50	7.00	302	254	303	52	73	73	294	thimble Q8
4	1150	175.50	1.15	0.58	0.58	7.00	305	251	295	50	74	73	297	back filter 47Q30
3	1155	177.47	1.25	0.63	0.63	8.00	307	253	280	46	75	74	300	int. orsat
2	1200	179.92	1.20	0.60	0.60	8.00	306	255	270	45	75	74	254	EDT
1	1205	182.27	1.05	0.53	0.53	7.50	306	254	267	45	74	73	255	thimble Q12
B5	1210	184.29	1.00	0.50	0.50	7.50	309	254	262	46	76	74	258	
4	1215	186.30	1.25	0.63	0.63	8.50	315	252	257	46	76	74	262	
3	1220	188.56	1.40	0.70	0.70	9.50	319	251	256	45	77	75	275	
2	1225	190.98	1.25	0.63	0.63	9.50	318	253	264	45	77	75	269	
1	1230	193.35	1.10	0.55	0.55	9.00	318	257	269	46	77	75	264	
C5	1235	195.55	1.00	0.50	0.50	9.00	310	254	272	46	77	75	268	
4	1240	197.59	1.15	0.58	0.58	10.00	316	252	273	47	77	75	281	
3	1245	199.80	0.95	0.48	0.48	10.00	321	253	279	47	77	75	285	
2	1250	201.90	1.15	0.58	0.58	11.00	319	254	281	48	77	75	291	
1	1255	204.13	1.15	0.58	0.58	11.00	316	252	280	48	78	75	280	
D5	1300	206.27	0.75	0.37	0.37	9.50	309	258	278	50	78	76	262	
4	1305	208.10	0.85	0.43	0.43	10.00	315	256	281	51	79	76	281	
3	1310	210.02	1.05	0.53	0.53	12.00	320	254	280	51	79	76	289	

Pitot Tube Calibration Factor C_p 0.811 ✓
Volume Collected V_m 64.563 ✓ ft^3
Water Collected V_w 97.7 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s -11.7 ✓ "H_2O

Pitot Tube No. M7 ✓
Baro. Press. P_b 29.05 ✓ "Hg
Probe Tip Dia. D_n 0.175 ✓ in.
% CO_2 13.2 ~~13.2~~ ✓ % CO 0.0 0.0 ✓
% O_2 6.0 ~~6.0~~ % N_2 ~~80.8~~ 80.8
Area Stack A_s 24507 ✓ in^2

Barometer No. 19-1 ✓
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 67.743 X 1.029 ✓
[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Probe Tip No. TFE1-6 ✓

Impinger Box No. Hg1

Impinger 1	Final Weight	815.0
	Initial Weight	752.7
	Increase	62.3
Impinger 2	Final Weight	741.2
	Initial Weight	728.7
	Increase	12.5
Impinger 3	Final Weight	743.4
	Initial Weight	739.6
	Increase	3.8
Impinger 4	Final Weight	768.8
	Initial Weight	762.5
	Increase	6.3
Impinger 5	Final Weight	1044.9
	Initial Weight	1044.7
	Increase	0.2
Impinger 6	Final Weight	753.6
	Initial Weight	752.7
	Increase	0.9
Impinger 7	Final Weight	751.7
	Initial Weight	752.2
	Increase	-0.5

Water Weight Gain

Imp 8
Final 902.1
Int. 889.9

V_w =
g SO_2 = -
V_w =

Impinger 1	62.3
Impinger 2	12.5
Impinger 3	3.8
Impinger 4	~~6.5~~ 6.3
Impinger 5	0.2
Impinger 6	0.9
Impinger 7	-0.5
Impinger 8	12.2
Total	97.7 = V_w

P_b =	29.05		$\%CO_2$ =	13.2	
V_m =	64.563		$\%O_2$ =	6.0	
V_w =	97.7		%CO =	0.0	
P_m =	0.518		$\%N_2$ =	80.8	
Avg ΔP =	1.036		A_s =	24507	
			D_n =	0.175	
Avg$\sqrt{\Delta P}$ =	1.014		T_t =	150	
C_p =	0.811				
P_s =	-11.70	"H_2O		28.19	"Hg
T_m =	77	°F		537	°R
T_s =	313	°F		773	°R

Moisture Content: %M = 6.95 M_d = 0.9305 MW_d = 30.352 MW = 29.49

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 64.563 \left[\frac{29.05 + \frac{0.518}{13.6}}{77 + 460}\right] = \frac{61.726\ sft^3}{0.412\ scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 97.7 = 4.611 sft^3

$$\%\ Moisture = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{4.611}{61.726 + 4.611} \times 100 = 6.95\ \%$$

$$V_s = 5123.8 \times 0.811 \sqrt{\frac{773}{28.19 \times 29.49}} \times 1.014 = 4063\ fpm$$

$$\%I = \frac{1{,}039 \times 61.726 \times 773}{28.19 \times 0.9305 \times 4063 \times 150 \times (0.175)^2} = 101.3\ \%$$

ACFM: 691486

SCFM: 415599

%EA: 38.9

Run Number 3

Unit 1 Baghouse Inlet Duct

Date 9-24-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	~~Ambient~~ Heated Line °F	Remarks
D2	1315	212.12	1.05	0.53	0.53	12.00	317	256	284	51	79	77	291	
1	1320	214.20	1.00	0.50	0.50	13.00	318	255	282	51	79	77	297	
E5	1325	216.09	0.64	0.325	0.32	11.00	310	257	284	55	79	77	302	
4	1330	217.83	0.75	0.37	0.37	15.00	314	258	286	54	80	78	269	
3	1335	219.61	1.10	0.55	0.50	18 20.00	315	258	286	55	80	79	270	pump off 1334 - 1348
3	1348	219.914	1.10	0.55	0.55	7.00	315	258	285	56	80	79	274	fan broke oil pump
2	1352	221.60	1.05	0.53	0.53	7.00	318	256	286	56	80	79	290	Δ thimble
1	1357	223.71	1.10	0.55	0.55	7.00	315	255	288	55	81	79	299	Q12
F5	1402	225.86	0.59	0.29	0.29	6.00	308	264	287	55	81	80	255	
4	1407	227.71	0.75	0.37	0.37	6.00	312	270	284	57	81	80	265	
3	1412	229.49	1.15	0.58	0.58	8.00	310	252	281	57	81	80	285	
2	1417	231.75	1.15	0.58	0.58	8.00	311	254	280	57	81	80	294	
1	1422	233.95	1.00	0.50	0.50	8.00	310	253	276	56	81	79	259	
END	1427	236.044	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 10H51 ✓
Job Name Epri ✓
Run Number 1 ✓
Unit Unit 1 ~~North~~ South Baghouse ~~South~~ Outlet Duct ✓
Date 9/23/99 ✓
Operator Lee / Hart / Hefley ✓
Sample Box No. Hg-4 Meter Box No. 8-2 ✓

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 79
Assumed Moisture % 7%
Probe Length 12'
C Factor 1.0 ⇒ 2.0 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 16.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF (V_m)	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
A1	~~1513~~ 1515	~~808.816~~ 808.363	1.30	0.65	0.65	8.0	292	249	265	64	78	76	282	Filter 47026
2	1600	811.71	1.45	0.74	0.74	8.0	304	251	260	59	80	77	283	Multi-Point
3	1605	814.11	1.50	0.76	0.76	8.0	308	250	271	57	82	77	283	Into Orsat
4	1610	816.59	1.30	0.65	0.65	7.5	310	249	272	56	83	78	283	
5	1615	818.731	0.94	0.48	0.48	6.0	309	266	264	66	79	79	274	pump off @ 1615
End	1654	821.440	—	—	—	—	—	—	—	—	—	—	—	pump on @ 1649
B1	1655	821.573	1.45	0.74	0.74	7.5	306	260	262	65	81	79	274	
2	~~1700~~ 1700	823.79	1.50	0.76	0.76	7.5	307	250	264	60	82	79	273	
3	1705	826.21	1.55	0.79	0.79	7.5	309	248	261	58	83	79	271	
4	1710	828.63	1.50	0.76	0.76	7.5	310	250	258	58	84	80	270	
5	1715	831.03	1.30	0.65	0.65	7.0	311	256	258	58	84	80	273	
End	1720	832.062	—	—	—	—	—	—	—	—	—	—	—	
C1	1721	833.311	0.95	0.48	0.48	5.5	302	253	262	62	83	80	275	
2	1726	835.21	1.50	0.76	0.76	7.0	306	256	263	62	83	81	275	
3	1731	837.50	1.55	0.79	0.79	7.5	308	258	263	61	82	81	277	
4	1736	839.96	1.50	0.76	0.76	7.5	310	268	262	59	81	81	278	
5	1741	842.32	1.50	0.76	0.76	7.5	311	267	264	59	81	81	278	
End	1746	844.613	—	—	—	—	—	—	—	—	—	—	—	

Pitot Tube Calibration Factor C_p 0.808 ✓
Volume Collected V_m 70.286 ✓ ft^3
Water Collected V_w 100.8 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s −18.8 ✓ "H_2O

Pitot Tube No. M-4 ✓
Baro. Press. P_b 29.06 ✓ "Hg
Probe Tip Dia. D_n 0.175 in.
% CO_2 12.0 ✓ % CO 0 ✓
% O_2 7.1 ✓ % N_2 80.9 ✓
Area Stack A_s 11,324 ✓ in^2

Barometer No. 19-1 ✓
Probe Tip No. TFE 2-6 ✓
Total Volume of Leak Checks After Start: — ✓ ft^3
V_m = Dry Gas Meter Calibration Factor 1.034 ✓ X 67.975

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

195.3

Impinger Box No. Hg 4

Impinger 1	Final Weight	814.4	Imp 8	Impinger 1	63.9
	Initial Weight	750.5	Final 968.0	Impinger 2	1.9
	Increase	63.9	Int. 956.0	Impinger 3	16.2
Impinger 2	Final Weight	760.3	12.0	Impinger 4	5.8
	Initial Weight	758.4		Impinger 5	1.3
	Increase	1.9		Impinger 6	5.9
Impinger 3	Final Weight	773.2	V_w =	Impinger 7	-6.2
	Initial Weight	757.0	g SO_2 =	8 impinger	12.0
	Increase	16.2	V_w =	Total	100.8 = V_w
Impinger 4	Final Weight	745.4			
	Initial Weight (BH)	~~738.0~~ 739.6			
	Increase	5.8			
Impinger 5	Final Weight	666.2	P_b = 29.06	$\%CO_2$ =	12.0
	Initial Weight	664.9	V_m = 70.286	$\%O_2$ =	7.1
	Increase	1.3	V_w = 100.8	%CO =	0
Impinger 6	Final Weight	773.1	P_m = 0.685	$\%N_2$ =	80.9
	Initial Weight	767.2	Avg ΔP = 1.352	A_s =	11.324
	Increase	5.9		D_n =	0.175
Impinger 7	Final Weight	758.3	Avg$\sqrt{\Delta P}$ = 1.159	T_t =	150
	Initial Weight	764.5	C_p = 0.808		
	Increase	-6.2	P_s = -18.8 "H_2O		27.68 "Hg
			T_m = 80 °F		540 °R
			T_s = 308 °F		768 °R

Water Weight Gain

Moisture Content: %M = 6.64 M_d = 0.9336 MW_d = 30.204 MW = 29.39

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 70.286 \left[\frac{29.06 + \frac{0.685}{13.6}}{80 + 460}\right] = 66.876\ sft^3 = 0.446\ scfm$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 100.8 = 4.758 sft^3

$$\%\ Moisture = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{4.758}{66.876 + 4.758} \times 100 = 6.64\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{768}{27.68 \times 29.39}} \times 1.159 = 4662\ fpm$$

$$\%I = \frac{1{,}039 \times \cancel{466}\ 66.876 \times 768}{150 \times 0.9336 \times 27.68 \times 4662 \times (0.175)^2} = 96.4\ \%$$

ACFM: 366625

SCFM: 218496

%EA: 49.5

Run Number 1

Unit Unit 1 South Baghouse Outlet Duct

Date 9-23-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	P_m Pump Vacuum "Hg Guage	T_s Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	T_m Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line	Remarks
D1	1747	844.726	1.40	0.71	0.71	7.0	308	250	272	61	79	81	279	
2	1752	846.92	1.45	0.74	0.74	7.5	307	250	273	59	79	80	279	
3	1757	849.25	1.40	0.71	0.71	7.5	309	258	265	58	80	80	278	
4	1802	851.55	1.60	0.81	0.81	8.0	311	264	266	59	80	79	277	
5	1807	853.96	1.50	0.76	0.76	7.5	311	272	263	59	81	79	278	
End	1812	855.933	—	—	—	—	—	—	—	—	—	—	—	
E1	1813	856.161	1.30	0.65	0.65	~~6.0~~ 6.5	305	264	262	63	80	79	278	
2	1818	858.03	1.40	0.71	0.71	7.5	307	260	264	60	81	79	278	
3	1823	859.98	1.20	0.61	0.61	6.5	309	264	265	60	82	79	278	
4	1828	861.84	1.30	0.65	0.65	6.5	311	268	263	60	81	79	277	
5	1833	863.89	1.60	0.81	0.81	8.0	312	270	263	59	82	79	275	
End	1838	865.816	—	—	—	—	—	—	—	—	—	—	—	
F1	1839	866.061	1.05	0.54	0.54	6.0	303	261	261	62	81	79	273	
2	1844	867.92	1.10	0.56	0.56	6.0	305	258	259	60	81	79	272	
3	1849	869.95	0.86	0.45	0.45	5.5	308	261	257	59	81	78	271	
4	1854	871.91	1.10	0.56	0.56	6.0	309	267	256	58	81	79	271	
5	1859	874.03	1.50	0.76	0.76	7.5	310	266	256	58	81	78	271	
End	1904	876.338	—	—	—	—	—	—	—	—	—	—	—	

Run Number 2

Unit Unit 1 Baghouse Outlet Duct

Date 9-24-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
C1	0900	915.568	1.00	0.52	0.52	6.0	296	256	254	54	64	60	276	
2	0905	917.43	1.40	0.75	0.75	8.0	300	257	254	53	65	60	275	
3	0910	919.69	1.45	0.78	0.78	8.5	302	260	256	52	66	61	275	
4	0915	922.04	1.50	0.80	0.80	8.5	303	265	255	51	66	61	275	
5	0920	924.42	1.30	0.69	0.69	8.0	303	266	253	50	66	61	275	
End	0925	926.392	—	—	—	—	—	—	—	—	—	—	—	
B1	0926	926.565	1.20	0.64	0.64	7.5	299	257	253	53	66	62	276	
2	0931	928.67	1.30	0.69	0.69	8.0	301	257	253	51	67	62	276	
3	0936	930.88	1.45	0.78	0.78	8.5	303	259	256	52	68	62	277	
4	0941	933.21	1.35	0.72	0.72	8.5	303	264	254	51	68	62	277	
5	0946	935.50	1.20	0.64	0.64	8.0	303	265	253	52	69	63	277	
End	0951	937.482	—	—	—	—	—	—	—	—	—	—	—	
A1	0952	937.583	1.30	0.69	0.69	8.0	298	254	255	54	68	63	280	
2	0957	939.71	1.40	0.75	0.75	8.5	300	255	253	52	69	64	280	
3	1002	942.06	1.40	0.75	0.75	9.0	302	259	256	52	71	64	279	
4	1007	944.35	1.35	0.72	0.72	9.0	303	261	255	52	71	65	279	
5	1012	946.63	0.88	0.47	0.47	7.5	303	262	255	52	71	65	280	
End	1017	948.725	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95WHS1 ✓
Job Name EPRI ✓
Run Number 3 ✓
Unit Unit 1 Baghouse South Outlet Duct
Date 9-24-99 ✓
Operator Lee Hart / Hefley ✓
Sample Box No. Hg 4 Meter Box No. 8-2 ✓

Hg Field Data

✓Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 78
Assumed Moisture % 7%
Probe Length 12'
C Factor 0.8 ⇒ 1.5 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 18.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
A1	1145	951.820	1.25	0.66	0.66	7.0	297	249	271	67	72	70	276	
2	1150	954.51	1.35	0.72	0.72	7.5	300	250	268	61	75	71	279	Filter 47027
3	1155	956.81	1.30	0.69	0.69	7.5	301	251	267	58	74	72	280	Multi-point
4	1200	959.09	1.05	0.56	0.56	6.5	302	250	267	57	75	72	281	Int. orset
5	1205	961.08	0.81	0.43	0.43	6.0	303	252	267	58	76	73	280	
End	1210	962.803	—	—	—	—	—	—	—	—	—	—	—	
B1	1211	962.980	1.30	0.69	0.69	7.5	299	251	276	60	78	75	281	
2	1216	965.17	1.30	0.69	0.69	7.5	300	252	275	56	79	75	283	
3	1221	967.38	1.40	0.74	0.74	8.0	303	263	270	56	79	77	286	
4	1226	969.67	1.30	0.69	0.69	7.5	303	269	274	55	78	77	283	
5	1231	971.92	1.20	0.64	0.64	7.5	304	263	270	56	77	77	280	
End	1236	973.846	—	—	—	—	—	—	—	—	—	—	—	
C1	1237	974.018	0.82	0.44	0.44	5.5	298	238	270	59	77	76	276	
2	1242	975.77	1.30	0.69	0.69	8.0	300	263	272	58	79	76	277	
3	1247	977.92	1.40	0.74	0.74	8.5	303	268	272	57	80	76	278	
4	1252	980.22	1.30	0.69	0.69	8.0	304	276	275	58	80	77	278	
5	1257	982.46	1.30	0.69	0.69	8.5	304	274	275	57	79	76	279	
End	1302	984.520	—	—	—	—	—	—	—	—	—	—	—	

Pitot Tube Calibration Factor C_p 0.808 ✓
Volume Collected V_m 66.430 ✓ ft^3
Water Collected V_w 121.0 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s −18.0 ✓ "H_2O

Pitot Tube No. M-4 ✓
Baro. Press. P_b 29.05 ✓ "Hg
Probe Tip Dia. D_n 0.175 ✓ in.
% CO_2 12.6 ✓ % CO Q ✓
% O_2 7.0 ✓ % N_2 ~~80.5~~ 80.4 ✓
Area Stack A_s 11,324 ✓ in^2

Barometer No. 19-1 ✓
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 1.034 ✓ x 64.246 ✓

Probe Tip No. TFE 2-6 ✓

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg4

Impinger 1	Final Weight	804.9
	Initial Weight	749.7
	Increase	55.2
Impinger 2	Final Weight	783.0
	Initial Weight	757.7
	Increase	25.3
Impinger 3	Final Weight	759.8
	Initial Weight	756.1
	Increase	3.7
Impinger 4	Final Weight	741.1
	Initial Weight	735.7
	Increase	5.4
Impinger 5	Final Weight	~~689.1~~ 659.1
	Initial Weight	660.2
	Increase	-1.1 ~~28.9~~
Impinger 6	Final Weight	776.9
	Initial Weight	759.6
	Increase	17.3
Impinger 7	Final Weight	760.9
	Initial Weight	757.2
	Increase	3.7

Water Weight Gain

Imp 8
Final 979.6
Int. 968.1
11.5

V_w =
g SO_2 = -
V_w =

BH

Impinger 1	55.2
Impinger 2	25.3
Impinger 3	3.7
Impinger 4	5.4
Impinger 5	~~28.9~~ -1.1
Impinger 6	17.3
Impinger 7	3.7
Imp 8	11.5
Total	~~121.0~~ = V_w

P_b =	29.05		$\%CO_2$ =	12.6
V_m =	66.430		$\%O_2$ =	7.0
V_w =	121.0		%CO =	0.0
P_m =	0.652		$\%N_2$ =	~~80.5~~ 80.4
Avg ΔP =	1.227		A_s =	11.324
			D_n =	0.175
Avg$\sqrt{\Delta P}$ =	1.104		T_t =	150
C_p =	0.808			
P_s =	-18.0	"H_2O	27.73	"Hg
T_m =	77	°F	537	°R
T_s =	302	°F	762	°R

Moisture Content: %M = 8.25 M_d = 0.9175 MW_d = ~~30.324~~ 30.296 MW = ~~29.31~~ 29.28

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 66.430 \left[\frac{29.05 + \frac{\cancel{1.227}\ 0.652}{13.6}}{77 + 460}\right] = \frac{63.533}{0.424}\ \frac{sft^3}{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 121.0 = 5.711 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{5.711}{63.533 + 5.711}$ x 100 = 8.25 %

V_s = 5123.8 x 0.808 $\sqrt{\frac{762}{27.73 \times \cancel{29.31}\ 29.28}}$ x 1.104 = ~~4426~~ 4428 fpm

%I = $\frac{1{,}039 \times 63.533 \times 762}{150 \times 0.9175 \times 27.73 \times \cancel{4426}\ 4428 \times (0.125)^2}$ = 97.2 %

ACFM: ~~348020~~ 348,199

SCFM: ~~205834~~ 205,927

%EA: ~~48.8~~ 48.9

Run Number 3

Unit Unit 1 Baghouse South Outlet Duct

Date 9-24-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
D1	1303	984.598	1.30	0.69	0.69	7.0	300	269	275	61	79	77	277	
2	1308	986.52	1.25	0.66	0.66	8.0	301	272	274	59	79	77	275	
3	1313	988.70	1.30	0.69	0.69	8.0	302	275	275	59	80	77	276	
4	1318	990.91	1.50	0.80	0.80	8.0	304	272	275	59	81	77	276	
5	1323	993.30	1.50	0.80	0.80	8.0	304	270	274	58	81	77	276	
End	1328	995.449	—	—	—	—	—	—	—	—	—	—	—	
E1	1329	995.540	1.30	0.69	0.69	7.0	300	273	272	63	80	78	276	
2	1334	997.56	1.25	0.66	0.66	8.0	301	270	272	61	80	78	277	
3	1339	999.75	1.10	0.58	0.58	7.5	303	271	274	58	80	78	276	
4	1344	1001.84	1.30	0.69	0.69	7.5	304	272	271	58	81	78	276	
5	1349	1004.01	1.50	0.80	0.80	9.0	304	270	272	59	81	78	277	
End	1354	1005.972	—	—	—	—	—	—	—	—	—	—	—	
F1	1355	1006.088	0.96	0.51	0.51	6.5	299	271	272	64	81	78	277	
2	1400	1007.97	0.99	0.53	0.53	7.5	301	275	274	60	81	78	277	
3	1405	1009.83	0.86	0.46	0.46	7.5	302	276	273	60	81	78	277	
4	1410	1011.69	0.93	0.50	0.50	7.5	303	275	270	58	80	78	278	
5	1415	1013.61	1.40	0.75	0.75	10.0	304	274	268	58	80	78	277	
End	1420	1016.066	—	—	—	—	—	—	—	—	—	—	—	

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-95WHS1

Job Name EPRI

Sampling Location Unit 1 Inlet

Date 9/23/99 Time 1314

Stack Height — ft.

Sampling Port Height Above Ground 100 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)					~~168 7/16~~
Port & Wall Thickness (in.)					21 11/16
Inside Stack Diameter (in.)					~~146 3/4~~ 146 3/4" X 167"

Sampling Ports are 14 ft. 0 in. equiv. 1.08 ~~1.14~~ stack diameters) ~~downstream~~ upstream from disturbance (~~inlet~~ constriction, bend, expansion)

Sampling Ports are 73 ft. 7 in. equiv. 5.65 ~~6.02~~ stack diameters) ~~upstream~~ downstream from disturbance (~~inlet~~ constriction, bend, expansion)

Point Number	Percent Diameter	Distance from Ref. Point (decimal in.)	Distance from Ref. Point (fractional in.)	Port A $\Delta P/T_s/\alpha$	Port B $\Delta P/T_s/\alpha$	Port C $\Delta P/T_s/\alpha$	Port D $\Delta P/T_s/\alpha$
1			14 5/8	1.10/304/5	1.25/309/-2	1.45/315/5	0.94/318/-5
2			44	1.05/314/5	0.91/324/0	1.20/324/0	0.95/329/-7
3			73 3/8	1.10/315/0	0.89/325/0	0.90/329/-8	0.92/328/0
4			102 3/4	0.90/312/0	0.94/321/0	0.88/324/0	0.55/323/-10
5			132 1/8	0.81/307/10	0.78/310/0	0.86/315/0	0.53/315/7
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
~~10~~ Port				/ E /	/ F /	/ /	/ /
~~11~~ 1				1.10/317/-5	0.98/315/0	/ /	/ /
~~12~~ 2				0.95/321/0	0.97/316/-7	/ /	/ /
~~13~~ 3				0.93/324/0	0.92/317/-6	/ /	/ /
~~14~~ 4				0.56/322/0	0.62/317/0	/ /	/ /
~~15~~ 5				0.36/315/4	0.32/315/4	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M7

C_p = 0.811

P_b = 29.20 "Hg

P_s = -11.40 "H_2O 28.36 "Hg

A_s = 24,507 in.^{2}

Average ΔP 0.891

Average $\Delta P^{1/2}$ 0.933

Average T_x 318 °F

Average α 3 ~~0~~ ~~0~~ degrees

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-95 WHS 1

Job Name EPRE

Sampling Location Unit 1 Outlet

Date ~~9/22/99~~ 9/23/99 Time ~~[illegible]~~

Stack Height — ft.

Sampling Port Height Above Ground 89 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)	120 3/8	120 3/8	120 3/8	120 3/8	120 3/8
Port & Wall Thickness (in.)	18 1/8	18 1/8	18 1/8	18 1/8	18 1/8
Inside Stack Diameter (in.)	102 1/4	102 1/4	102 1/4	102 1/4	102 1/4

102 1/4" X
110 3/4"

Sampling Ports are ~~267~~ 22 ft. ~~267~~ 3 in. (2.51 stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 5 ft. ~~68~~ 8 in. (0.64 stack diameters) upstream from disturbance (outlet, constriction, bend, expansion)

port E	port F
120 3/8	120 3/8
18 1/8	18 1/8
102 1/4	102 1/4

Point Number	Percent Diameter	Distance from Ref. Point (decimal in.)	Distance from Ref. Point (fractional in.)	Port A $\Delta P/T_s/\alpha$	Port B $\Delta P/T_s/\alpha$	Port C $\Delta P/T_s/\alpha$	Port D $\Delta P/T_s/\alpha$
1	~~10 1/4~~	10.25	10 1/4	0.98 1277 +2	1.20 1285 +12	0.99 1280 +20	1.35 1281 +20
2	~~30 5/8~~	30.688	~~30 5/8~~ 30 11/16	0.97 1278 +10	1.45 1288 +11	1.60 1281 +14	1.50 1284 +18
3	~~51~~	51.125	51 1/8	0.85 1279 +12	1.45 1290 +15	1.70 1282 +20	1.50 1285 +20
4	~~71 3/8~~	71.563	71 3/8 9/16	1.00 1280 +7	1.35 1290 +10	1.85 1282 +20	1.75 1286 +20
5	~~91 3/4~~	92	~~91 3/4~~ 92	1.05 1280 +15	1.15 1291 +20	1.65 1284 +15	1.85 1287 +30
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
10				/ /	/ /	/ /	/ /
11				Port E	Port F	/ /	/ /
12				~~2.70~~ 1.10 1278 +20	0.97 1278 +1	/ /	/ /
13				1.50 1282 +8	0.99 1280 +1	/ /	/ /
14				1.30 1285 +15	0.97 1279 +2	/ /	/ /
15				1.30 1287 +30	0.94 1280 0	/ /	/ /
16				1.80 1284 +40	0.96 1278 +2	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M-4

C_p = 0.808

P_b = 29.18 "Hg

P_s = ~~-18.4~~ "H_2O 27.83 "Hg

A_s = 11324 in.^{2}

Average ΔP 1.30

Average $\Delta P^{1/2}$ 1.132

Average T_x 283 °F

Average α ~~15.4~~ 14.47 degrees

METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-WSH 1 Sample Location: Unit Number 1 Inlet Duct

Job Name: EPRI Analytical Method: 3B

Location: Stratton, OH Sample Type: Single point or Multi point; Grab or Integrated

Date: 23 September 1999 Leak Check: Time: 5 (min. 4 minutes) Rate: 0.0

Operator: Pellegrine Ambient Air Check:

CO_2 - % Vol.	0.0
O_2 - % Vol.	20.9
N_2 - % Vol.	79.1

Run Number 1 Run Time 1601-1902	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.0	13.0	13.0	13.0
O_2 - % Vol.	6.0	6.1	6.0	6.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	81.0	80.9	81.0	81.0

$F_o = 1.146$

Run Number 2 Run Time 0745-1015	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.2	13.2	13.2	13.2
O_2 - % Vol.	6.4 ~~0.0~~ 6.0	6.4 ~~0.0~~ 6.0	6.4 ~~0.0~~ 6.0	6.4 ~~0.0~~ 6.0
CO - % Vol.	~~6.0~~ 0.0	~~6.0~~ 0.0	~~6.0~~ 0.0	~~6.0~~ 0.0
N_2 - % Vol.	80.8	80.8	80.8	80.8

$F_o = 1.129$

Run Number 3 Run Time 1145-1427	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.2	13.2	13.2	13.2
O_2 - % Vol.	6.1	6.0	6.0	6.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.6	80.8	80.8	80.8

$F_o = 1.129$

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METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-95WSH 1 Sample Location: Unit Number 1 South Outlet Baghouse Duct

Job Name: EPRI Analytical Method: 3B

Location: ~~Unit #~~ T Stratton, OH Sample Type: Single point or Multi point; Grab or Integrated

Date: 23 September 1999 Leak Check: Time: 5 (min. 4 minutes) Rate: 0.0

Operator: Pellegrine Ambient Air Check:

CO_2 - % Vol.	0.0
O_2 - % Vol.	20.9
N_2 - % Vol.	79.1

Run Number 1 Run Time 1555-1904	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	12.0	12.0	12.0	12.0
O_2 - % Vol.	7.1	7.0	7.1	7.1
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.9	81.0	80.9	80.9

$F_o = 1.150$

Run Number 2 Run Time 0742-1017	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	12.4	12.4	12.4	12.4
O_2 - % Vol.	6.8	6.8	6.8	6.8
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.8	80.8	80.8	80.8

$F_o = 1.137$

Run Number 3 Run Time 1145-1420	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	BH ~~7.0~~ 12.6	BH ~~6.9~~ 12.4	12.5	12.6
O_2 - % Vol.	7.0	6.9	7.0	7.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.5	80.5	BH ~~80.4~~ ~~80.5~~

$F_o = 1.103$

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APPENDIX C

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-4	0.808	09/15/99
Pitot Tube #M-7	0.811	09/15/99
Probe Tip #TFE-1-6	0.175	08/09/99
Probe Tip #TFE-2-6	0.175	08/09/99
Dry Gas Meter #8-2	1.034	09/02/99
Stack Unit Orifice #8-2		09/03/99
Digital Temperature Indicator #8-2		09/02/99
Dry Gas Meter #27-2	1.029	08/13/99
Stack Unit Orifice #27-2		08/14/99
Digital Temperature Indicator #27-2		08/13/99
Barometer #19-1		08/09/99

APPENDIX C

Post Test

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-4	0.808	10/04/99
Pitot Tube #M-7	0.811	10/04/99
Probe Tip #TFE-1-6	0.174	10/04/99
Probe Tip #TFE-2-6	0.175	10/05/99
Dry Gas Meter #8-2	1.070	10/05/99
Stack Unit Orifice #8-2		10/06/99
Digital Temperature Indicator #8-2		10/05/99
Dry Gas Meter #27-2	1.015	11/07/99
Stack Unit Orifice #27-2		11/07/99
Digital Temperature Indicator #27-2		11/07/99
Barometer #19-1		10/04/99

PITOT TUBE CALIBRATION

Date: 9-15-99

Time: 1005

Pitot No.: m-4 (new)

T_s: 72 °F

Pitot Dimensions: 3/8" Tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808 ✓	0.15	0.387	0.808 ✓
14	30	0.22	0.22	0.469	0.33	0.574	0.808 ✓	0.33	0.574	0.808 ✓
20	40	0.34	0.34	0.583	0.51	0.714	0.808 ✓	0.51	0.714	0.808 ✓
28	50	0.54	0.54	0.735	0.81	0.900	0.808 ✓	0.81	0.900	0.808 ✓
35	60	0.80	0.80	0.894	1.20	1.095	0.808 ✓	1.20	1.095	0.808 ✓
41	70	1.00	1.00	1.000	1.50	1.225	0.808 ✓	1.50	1.225	0.808 ✓
50	80	1.30	1.30	1.140	1.95	1.396	0.808 ✓	1.95	1.396	0.808 ✓
62	90	1.60	1.60	1.265	2.40	1.549	0.808 ✓	2.40	1.549	0.808 ✓
28	50	0.54	0.54	0.735	0.81	0.900	0.808 ✓	0.81	0.900	0.808 ✓
28	50	0.54	0.54	0.735	0.81	0.900	0.808 ✓	0.81	0.900	0.808 ✓
Average							0.808 ✓			0.808 ✓

Summary of Results:

Normal high side calibration factor 0.808 ✓

variation + 0.00% ✓

variation - 0.00% ✓

Normal low side calibration factor 0.808 ✓

variation + 0.00% ✓

variation - 0.00% ✓

Calibrator: Jason Conway #273

Checked By: #127

PITOT TUBE CALIBRATION

Date: 9-15-99 Time: 1420

Pitot No.: M-7 (new) T_s: 72 °F

Pitot Dimensions: 3/8" Tips C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.32	0.566	0.821	0.32	0.566	0.821
20	40	0.34	0.34	0.583	0.50	0.707	0.816	0.50	0.707	0.816
28	50	0.54	0.55	0.738	0.81	0.900	0.812	0.81	0.900	0.812
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.50	1.225	0.808	1.50	1.225	0.808
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.811			0.811

Summary of Results:

Normal high side calibration factor 0.811

variation + 1.23%

variation - 0.37%

Normal low side calibration factor 0.811

variation + 1.23%

variation - 0.37%

Calibrator: Jason Conway #273

Checked By: [illegible]

NOZZLE CALIBRATION

Nozzle Set No. TFE-1 (New)

Date 8-09-99 Calibrator: Mike Bass

	4	6	7	8	10	12
Reading 1	0.118	0.175	0.201	0.228	0.309	0.362
Reading 2	0.116	0.176	0.198	0.227	0.308	0.364
Reading 3	0.115	0.174	0.201	0.227	0.308	0.363
Reading 4	0.118	0.173	0.199	0.227	0.310	0.362
Reading 5	0.116	0.175	0.199	0.227	0.310	0.364
Reading 6	0.115	0.175	0.200	0.228	0.310	0.362
Reading 7	0.117	0.176	0.201	0.226	0.310	0.363
Reading 8	0.116	0.177	0.201	0.227	0.309	0.363
Reading 9	0.118	0.176	0.200	0.227	0.310	0.363
Reading 10	0.118	0.175	0.200	0.226	0.310	0.363
Average	0.117	0.175	0.200	0.227	0.309	0.363

	14	—	—	—	—	—
Reading 1	0.432					
Reading 2	0.434					
Reading 3	0.430					
Reading 4	0.434					
Reading 5	0.430					
Reading 6	0.434					
Reading 7	0.430					
Reading 8	0.430					
Reading 9	0.431					
Reading 10	0.432					
Average	0.432					

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE 2 (NEW)

Date 8-09-99 Calibrator: Mike Bass

	4	6	7	8	10	12
Reading 1	0.117	0.175	0.201	0.234	0.308	0.362
Reading 2	0.116	0.176	0.199	0.234	0.309	0.362
Reading 3	0.118	0.177	0.199	0.235	0.312	0.362
Reading 4	0.116	0.174	0.200	0.235	0.311	0.360
Reading 5	0.114	0.175	0.199	0.236	0.312	0.362
Reading 6	0.116	0.175	0.200	0.234	0.311	0.361
Reading 7	0.115	0.174	0.200	0.234	0.312	0.361
Reading 8	0.117	0.174	0.199	0.235	0.308	0.362
Reading 9	0.115	0.176	0.199	0.235	0.312	0.361
Reading 10	0.114	0.176	0.200	0.235	0.310	0.363
Average	0.116	0.175	0.200	0.235	0.311	0.362

	14	—	—	—	—	—
Reading 1	0.434					
Reading 2	0.430					
Reading 3	0.434					
Reading 4	0.432					
Reading 5	0.430					
Reading 6	0.430					
Reading 7	0.434					
Reading 8	0.434					
Reading 9	0.430					
Reading 10	0.433					
Average	0.432					

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 8-2

Date: 9-2-99

ΔH ("H_2O)	C_{DG}
0.5	1.046
1.0	1.036
1.5	1.035
2.0	1.021
3.0	1.035
4.0	1.030
Average	1.034

Variation: + 1.16%

- 1.26%

Calibrator: Jason Chessher #275

Checked By: Mike Bass

C_{DG} @ 2 liters/min. = 1.043

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.50" H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1431	5.271 cf	75 °F	-0.80 "H_2O
Start	1417	0.000 cf	75 °F	-0.80 "H_2O
Avg.	14	5.271 cf	75 °F	-0.80 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	476.141 cf	75 °F	75 °F	0.50 "H_2O
Start	471.129 cf	72 °F	72 °F	0.50 "H_2O
Avg.	5.012 cf	74 °F	°F	0.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.271 \left[\frac{29.86 + \frac{-0.80}{13.6}}{75 + 460}\right] \times 1.000 \ (C_f) = 5.182 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.012 \left[\frac{29.86 + \frac{0.50}{13.6}}{74 + 460}\right] = 4.953 \text{ dcsf}$$

$$C_{DG} = \frac{5.182}{4.953} = \boxed{1.046}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0" H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)						Dry Gas Meter				
	Time	Meter Reading	Temp.	P_m		Meter Reading	Temp. In	Temp. Out	P_m	
End	1446	5.218 cf	75 °F	-1.3	"H_2O	482.256 cf	73 °F	79 °F	1.00	"H_2O
Start	1437	0.000 cf	75 °F	-1.3	"H_2O	477.246 cf	73 °F	76 °F	1.00	"H_2O
Avg.	9	5.218 cf	75 °F	-1.3	"H_2O	5.010 cf	75 °F	°F	1.00	"H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.218 \left[\frac{29.86 + \frac{-1.3}{13.6}}{75 + 460}\right] \times 1.000 \ (C_t) = 5.124 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.010 \left[\frac{29.86 + \frac{1.00}{13.6}}{75 + 460}\right] = 4.948 \text{ dcsf}$$

$$C_{DG} = \frac{5.124}{4.948} = \boxed{1.036}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.50" H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)	Time	Meter Reading	Temp.	P_m
End	1506	10.404 cf	76 °F	-1.80 "H_2O
Start	1451	0.000 cf	76 °F	-1.80 "H_2O
Avg.	15	10.404 cf	76 °F	-1.80 "H_2O

Dry Gas Meter	Meter Reading	Temp. In	Temp. Out	P_m
End	492.610 cf	74 °F	81 °F	1.50 "H_2O
Start	482.598 cf	75 °F	81 °F	1.50 "H_2O
Avg.	10.012 cf	78 °F	°F	1.50 "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 10.404 \left[\frac{29.86 + \frac{-1.80}{13.6}}{76 + 460}\right] \times 1.000\ (C_f) = 10.185\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 10.012 \left[\frac{29.86 + \frac{1.50}{13.6}}{78 + 460}\right] = 9.844\ dcsf$$

$$C_{DG} = \frac{10.185}{9.844} = \boxed{1.035}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0 "H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1524	10.370 cf	75 °F	-2.10 "H_2O
Start	1510	0.000 cf	75 °F	-2.10 "H_2O
Avg.	14	10.370 cf	75 °F	-2.10 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	503.477 cf	75 °F	81 °F	2.0 "H_2O
Start	493.369 cf	74 °F	80 °F	2.0 "H_2O
Avg.	10.108 cf	~~77.5~~ 78 °F		2.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.370 \left[\frac{29.86 + \frac{-2.10}{13.6}}{75 + 460}\right] \times 1.000 \ (C_f) = 10.163 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.108 \left[\frac{29.86 + \frac{2.0}{13.6}}{78 + 460}\right] = 9.951 \text{ dcsf}$$

$$C_{DG} = \frac{10.163}{9.951} = \boxed{1.021}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2-

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0" H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	1536	10.399	cf	75	°F	-3.20	"H_2O
Start	1525	0.000	cf	75	°F	-3.20	"H_2O
Avg.	11	10.399	cf	75	°F	-3.20	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
End	513.955	cf	76	°F	90	°F	3.00	"H_2O
Start	503.929	cf	75	°F	85	°F	3.00	"H_2O
Avg.	10.026	cf	82	°F			3.00	"H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.399 \left[\frac{29.86 + \frac{-3.20}{13.6}}{75 + 460}\right] \times 1.000 \ (C_f) = 10.163 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.026 \left[\frac{29.86 + \frac{3.00}{13.6}}{82 + 460}\right] = 9.821 \text{ dcsf}$$

$$C_{DG} = \frac{10.163}{9.821} = \boxed{1.035}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Calibrator: Jason Chessher

Date: 9-2-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.0" H_2O

P_b: 29.86 "Hg

Control Module Vacuum: 5.0 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1551	10.820 cf	75 °F	-3.90 "H_2O	525.120 cf	87 °F	76 °F	4.00 "H_2O
Start	1540	0.000 cf	75 °F	-3.90 "H_2O	514.703 cf	85 °F	76 °F	4.00 "H_2O
Avg.	11	10.820 cf	75 °F	-3.90 "H_2O	10.417 cf	81	°F	4.00 "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 10.820 \left[\frac{29.86 + \frac{-3.90}{13.6}}{75 + 460}\right] \times 1.000\ (C_f) = 10.556\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 10.417 \left[\frac{29.86 + \frac{4.00}{13.6}}{81 + 460}\right] = 10.248\ dcsf$$

$$C_{DG} = \frac{10.556}{10.248} = \boxed{1.030 \ \cancel{10.030}}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 9-2-99

Calibrator: Jason Chessher

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2 L/min

P_b: 29.86 "Hg

Control Module Vacuum: 2.0 "Hg

Wet Test Meter (No. 1)

	Time	Meter Reading	Temp.	P_m
End	1646	2.073 cf	74 °F	-0.70 "H_2O
Start	1615	0.000 cf	74 °F	-0.70 "H_2O
Avg.	31	2.073 cf	74 °F	-0.70 "H_2O

Dry Gas Meter

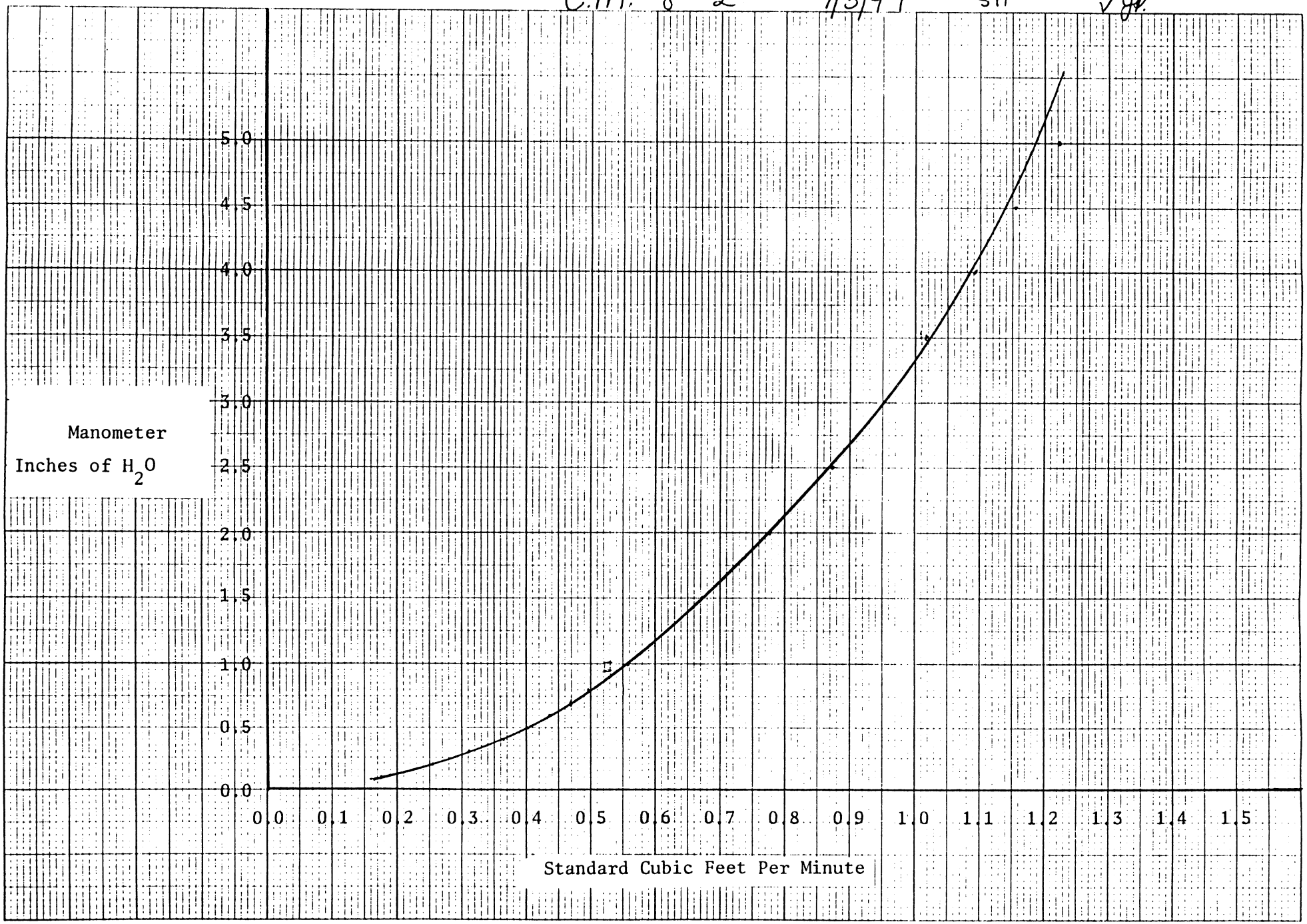
	Meter Reading	Temp. In	Temp. Out	P_m
End	528.148 cf	75 °F	75 °F	0.01 "H_2O
Start	526.144 cf	77 °F	76 °F	0.01 "H_2O
Avg.	2.004 cf	76 °F	°F	0.01 "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 2.073 \left[\frac{29.86 + \frac{-0.70}{13.6}}{74 + 460}\right] \times 1.006 \quad (C_f) = \cancel{2.042}\ 2.055 \text{ dcsf}$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 2.004 \left[\frac{29.86 + \frac{0.01}{13.6}}{76 + 460}\right] = 1.971 \text{ dcsf}$$

$$C_{DG} = \frac{\cancel{2.042}\ 2.055}{1.971} = \boxed{\cancel{1.036}\ 1.043}$$

C.M. 8-2 9/3/99 SH VJP



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 8-2

CALIBRATION DATA

Date: 9-2-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1120	75	72
Ice Bath	1127	37	36
Boiling Water	1135	212	212
Oven	1320	250	252
Oven	1325	300	302
Oven	1329	350	350
Oven	1335	375	377

Meter Adjusted? Yes _____ No ✓

Calibrator: Jason Chessher #275

Checked By: Mike Bass

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 8-13-99

ΔH ("H_2O)	C_{DG}
0.5	1.036
1.0	1.023
1.5	1.025
2.0	1.033
3.0	1.034
4.0	1.024
Average	1.029

Variation: + 0.68% ✓

- 0.58% ✓

Calibrator: Shane Lee 261

Checked By: Mike Bass 243

C_{DG} @ 2 liters/min. = 1.033

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5" H.O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1512	5.315 cf	73 °F	-1.20 "H_2O	312.440 cf	73 °F	73 °F	0.50 "H_2O
Start	1500	0.000 cf	73 °F	-1.20 "H_2O	307.333 cf	72 °F	72 °F	0.50 "H_2O
Avg.	12	5.315 cf	73 °F	-1.20 "H_2O	5.107 cf	73 °F		0.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.315 \left[\frac{29.20 + \frac{-1.20}{13.6}}{73 + 460} \right] \times 1.000\ (C_f) = 5.124 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.107 \left[\frac{29.20 + \frac{0.50}{13.6}}{73 + 460} \right] = 4.944 \text{ dcsf}$$

$$C_{DG} = \frac{5.124}{4.944} = \boxed{1.036}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0 "H_2O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)	Time	Meter Reading	Temp.	P_m	Dry Gas Meter	Meter Reading	Temp. In	Temp. Out	P_m
End	1449	5.168 cf	73 °F	-1.80 "H_2O		307.007 cf	73 °F	72 °F	1.00 "H_2O
Start	1440	0.000 cf	73 °F	-1.80 "H_2O		301.998 cf	72 °F	71 °F	1.00 "H_2O
Avg.	9	5.168 cf	73 °F	-1.80 "H_2O		5.009 cf	72 °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.168 \left[\frac{29.20 + \frac{-1.80}{13.6}}{73 + 460} \right] \times 1.000 \ (C_f) = 4.975 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.009 \left[\frac{29.20 + \frac{1.00}{13.6}}{72 + 460} \right] = 4.865 \text{ dcsf}$$

$$C_{DG} = \frac{4.975}{4.865} = \boxed{1.023}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.5 "H_2O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1529	10.355 cf	73 °F	-2.20 "H_2O
Start	1515	0.000 cf	73 °F	-2.20 "H_2O
Avg.	14	10.355 cf	73 °F	-2.20 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	322.948 cf	77 °F	73 °F	1.50 "H_2O
Start	312.925 cf	73 °F	73 °F	1.50 "H_2O
Avg.	10.023 cf	74 °F		1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.355 \left[\frac{29.20 + \frac{-2.20}{13.6}}{73 + 460} \right] \times 1.000\ (C_f) = 9.957 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.023 \left[\frac{29.20 + \frac{1.50}{13.6}}{74 + 460} \right] = 9.710 \text{ dcsf}$$

$$C_{DG} = \frac{9.957}{9.710} = \boxed{1.025}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0" H.O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1605	10.514 cf	73 °F	-2.60 "H_2O	343.568 cf	80 °F	76 °F	2.00 "H_2O
Start	1552	0.000 cf	73 °F	-2.60 "H_2O	333.427 cf	77 °F	73 °F	2.00 "H_2O
Avg.	13	10.514 cf	73 °F	-2.60 "H_2O	10.141 cf	77 °F		2.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.514 \left[\frac{29.20 + \frac{-2.60}{13.6}}{73 + 460}\right] \times 1.000\ (C_f) = 10.100 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.141 \left[\frac{29.20 + \frac{2.00}{13.6}}{77 + 460}\right] = 9.782 \text{ dcsf}$$

$$C_{DG} = \frac{10.100}{9.782} = \boxed{1.033}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0 " H_2O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)							Dry Gas Meter				
	Time	Meter Reading		Temp.		P_m	Meter Reading		Temp. In	Temp. Out	P_m
End	1618	11.961	cf	73	°F	-3.60 "H_2O	355.643	cf	83 °F	75 °F	3.00 "H_2O
Start	1607	0.000	cf	73	°F	-3.60 "H_2O	344.157	cf	78 °F	74 °F	3.00 "H_2O
Avg.	11	11.961	cf	73	°F	-3.60 "H_2O	11.486	cf	78	°F	3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 11.961 \left[\frac{29.20 + \frac{-3.60}{13.6}}{73 + 460}\right] \times 1.000\ (C_f) = 11.461 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 11.486 \left[\frac{29.20 + \frac{3.00}{13.6}}{78 + 460}\right] = 11.086 \text{ dcsf}$$

$$C_{DG} = \frac{11.461}{11.086} = \boxed{1.034}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.0" H2O

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1630	10.708 cf	73 °F	-4.30 "H_2O	366.588 cf	84 °F	75 °F	4.00 "H_2O
Start	1620	0.000 cf	73 °F	-4.30 "H_2O	356.234 cf	81 °F	75 °F	4.00 "H_2O
Avg.	10	10.708 cf	73 °F	-4.30 "H_2O	10.354 cf	79 °F		4.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.708 \left[\frac{29.20 + \frac{-4.30}{13.6}}{73 + 460}\right] \times 1.000 \ (C_f) = 10.242 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.354 \left[\frac{29.20 + \frac{4.00}{13.6}}{79 + 460}\right] = 10.000 \text{ dcsf}$$

$$C_{DG} = \frac{10.242}{10.000} = \boxed{1.024}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 8-13-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0 l/min.

P_b: 29.20 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1711	2.700 cf	73 °F	-0.20 "H_2O	369.641 cf	73 °F	72 °F	0.02 "H_2O
Start	1636	0.000 cf	73 °F	-0.20 "H_2O	367.018 cf	79 °F	75 °F	0.02 "H_2O
Avg.	35	2.700 cf	73 °F	-0.20 "H_2O	2.623 cf	75 °F		0.02 "H_2O

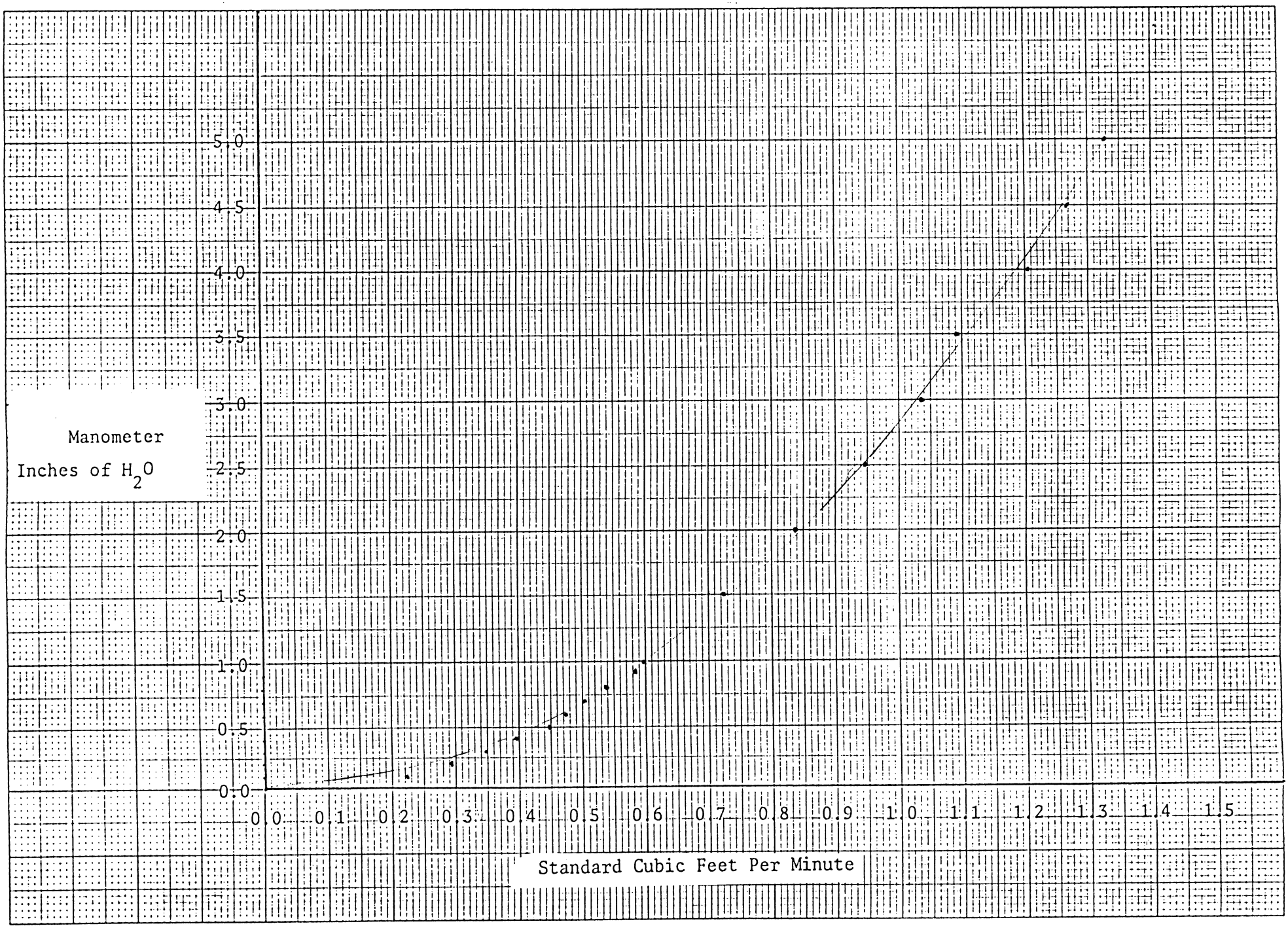
$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 2.700 \left[\frac{29.20 + \frac{-0.20}{13.6}}{73 + 460} \right] \times 1.000\ (C_f) = 2.609\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 2.623 \left[\frac{29.20 + \frac{0.02}{13.6}}{75 + 460} \right] = 2.527\ dcsf$$

$$C_{DG} = \frac{2.609}{2.527} = \boxed{1.033}$$

Cm 27-2 1.029

8/14/99



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

Date: 8-13-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	0944	72	72 ✓
Ice Bath	0947	32	33 ✓
Boiling Water	0958	212	211 ✓
Oven	1003	250	250 ✓
Oven	1007	300	300 ✓
Oven	1010	350	351 ✓
Oven	1014	375	375 ✓

Meter Adjusted? Yes _____ No ✓

Calibrator: Shane Lee 261

Checked By: Mike Bass 263

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 8-09-99

Time: 1630

Barometric Pressure @ Addison Airport @ 719 ft.	=	29.83
	-	0.719
Absolute Pressure @ Addison Airport	=	29.111
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.194
Barometer Reading	=	29.200
Variation	=	-0.006

Barometer Adjusted? Yes _____ No ✓

Mike Bass

Signature of Calibrator

PITOT TUBE CALIBRATION

Date: 10-4-99 Time: 1300

Pitot No.: P14 T_s: 72 °F

Pitot Dimensions: 3/8" tips C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808
20	40	0.34	0.34	0.583	0.51	0.714	0.808	0.51	0.714	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.50	1.225	0.808	1.50	1.225	0.808
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.808			0.808

Summary of Results:

Normal high side calibration factor 0.808

variation + 0.00%

variation - 0.00%

Normal low side calibration factor 0.808

variation + 0.00%

variation - 0.00%

Calibrator: Jason Brown 274

Checked By: Jason Conway #273

PITOT TUBE CALIBRATION

Date: 10-4-99

Time: 1430

Pitot No.: M7

T_s: 72 °F

Pitot Dimensions: 3/8" h/.5

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.32	0.566	0.821	0.32	0.566	0.821
20	40	0.34	0.34	0.583	0.50	0.707	0.816	0.50	0.707	0.816
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.50	1.225	0.808	1.50	1.225	0.808
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.811			0.811

Summary of Results:

Normal high side calibration factor 0.811

variation + 1.23%

variation - 0.37%

Normal low side calibration factor 0.811

variation + 1.23%

variation - 0.37%

Calibrator: Jim Brown 274

Checked By: Jason Conway # 273

✓ AM 107

NOZZLE CALIBRATION

Nozzle Set No. TFE-1

Date 10-4-00 Calibrator: Jason Brown

	4	6	7	8	10	12
Reading 1	0.114	0.175	0.199	0.226	0.310	0.362
Reading 2	0.116	0.175	0.198	0.227	0.309	0.363
Reading 3	0.114	0.173	0.199	0.226	0.309	0.363
Reading 4	0.114	0.173	0.200	0.226	0.310	0.362
Reading 5	0.116	0.175	0.200	0.227	0.308	0.364
Reading 6	0.117	0.175	0.200	0.227	0.309	0.364
Reading 7	0.118	0.174	0.202	0.226	0.309	0.364
Reading 8	0.116	0.173	0.200	0.225	0.310	0.363
Reading 9	0.118	0.175	0.200	0.226	0.309	0.363
Reading 10	0.118	0.175	0.199	0.227	0.309	0.363
Average	0.116 ✓	0.174 ✓	0.200 ✓	0.226 ✓	0.309	0.363

	14	—	—	—	—	—
Reading 1	0.430					
Reading 2	0.432					
Reading 3	0.430					
Reading 4	0.430					
Reading 5	0.432					
Reading 6	0.431					
Reading 7	0.432					
Reading 8	0.432					
Reading 9	0.432					
Reading 10	0.431					
Average	0.431					

MITECO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE-2

Date 10-5-99 Calibrator: JASON BROWN 274

	4	6	7	8	10	12
Reading 1	0.117	0.175	0.200	0.234	0.308	0.362
Reading 2	0.116	0.175	0.201	0.234	0.309	0.362
Reading 3	0.118	0.177	0.200	0.235	0.312	0.362
Reading 4	0.116	0.176	0.199	0.236	0.311	0.360
Reading 5	0.114	0.174	0.199	0.234	0.312	0.362
Reading 6	0.116	0.174	0.199	0.234	0.311	0.361
Reading 7	0.115	0.175	0.200	0.235	0.312	0.361
Reading 8	0.117	0.175	0.201	0.235	0.308	0.362
Reading 9	0.115	0.176	0.200	0.235	0.312	0.361
Reading 10	0.114	0.176	0.200	0.235	0.310	0.363
Average	0.116	0.175	0.200	0.235	0.311	0.362

	14	—	—	—	—	—
Reading 1	0.434					
Reading 2	0.430					
Reading 3	0.434					
Reading 4	0.432					
Reading 5	0.430					
Reading 6	0.430					
Reading 7	0.434					
Reading 8	0.434					
Reading 9	0.430					
Reading 10	0.433					
Average	0.432					

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 8-2

Date: 10/5/99

ΔH ("H_2O)	C_{DG}
0.5	1.078
1.0	1.065
1.5	1.065
2.0	1.070
3.0	1.071
4.0	1.068
Average	1.070 ✓

Variation: + 0.75 ✓

- 0.47 ✓

Calibrator: Shane Lee 261

Checked By: Scott B Hart # 268

C_{DG} @ 2 liters/min. = _____

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 10-5-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5" H_2O

P_b: 29.76 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1596	5.317 cf	75 °F	-0.90 "H_2O
Start	1531	0.000 cf	75 °F	-0.90 "H_2O
Avg.	15 ✓	5.317 ✓ cf	75 ✓ °F	-0.90 ✓ "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	328.475 cf	83 °F	82 °F	0.50 "H_2O
Start	323.494 cf	82 °F	81 °F	0.50 "H_2O
Avg.	4.981 ✓ cf	82 ✓ °F		0.50 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.317 \left[\frac{29.76 + \frac{-0.90}{13.6}}{75 + 460}\right] \times 1.000\ (C_f) = 5.209\ ✓\ dcsf$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 4.981 \left[\frac{29.76 + \frac{0.50}{13.6}}{82 + 460}\right] = 4.833\ ✓\ dcsf$$

$$C_{DG} = \frac{5.209}{4.833} = \boxed{1.078\ ✓}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 10-5-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0" H_2O

P_b: 29.76 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)						Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m		Meter Reading	Temp. In	Temp. Out	P_m
End	1557	5.460 cf	75 °F	-1.40	"H_2O	333.976 cf	88 °F	82 °F	1.00 "H_2O
Start	1548	0.000 cf	75 °F	-1.40	"H_2O	328.794 cf	84 °F	82 °F	1.00 "H_2O
Avg.	9 ✓	5.460 ✓ cf	75 ✓ °F	-1.40 ✓	"H_2O	5.182 ✓ cf	84 ✓ °F		1.00 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.460 \left[\frac{29.76 + \frac{-1.40}{13.6}}{75 + 460}\right] \times 1.000 \ (C_f) = 5.342 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.182 \left[\frac{29.76 + \frac{1.00}{13.6}}{84 + 460}\right] = 5.016 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{5.342}{5.016} = \boxed{1.065 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 10-5-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.5" H_2O

P_b: 29.76 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)						Dry Gas Meter				
	Time	Meter Reading	Temp.		P_m	Meter Reading	Temp. In		Temp. Out	P_m
End	1616	12.002 cf	75	°F	-2.00 "H_2O	345.691 cf	93	°F	87 °F	1.50 "H_2O
Start	1559	0.000 cf	75	°F	-1.80 "H_2O	334.272 cf	87	°F	82 °F	1.50 "H_2O
Avg.	17 ✓	12.002 ✓ cf	75 ✓	°F	-1.90 ✓ "H_2O	11.425 ✓ cf	87 ✓	°F		1.50 ✓ "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 12.002 \left[\frac{29.76 + \frac{-1.90}{13.6}}{75 + 460} \right] \times 1.000 \quad (C_f) = 11.728 \checkmark\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 11.425 \left[\frac{29.76 + \frac{1.50}{13.6}}{87 + 460} \right] = 11.012 \checkmark\ dcsf$$

$$C_{DG} = \frac{11.728}{11.012} = \boxed{1.065 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATIO

Meter Number: 8-2

Date: 10-5-99

Calibrator: [illegible]

Calibration Factor (C_{DG}) = *Wet Test Me* [illegible] $_{std}$ / *Dry Gas Me* [illegible] $_{std}$

Run No.: 1 @ 2.0" H_2O

P_b: 2[illegible] [illegible] "Hg

Control Modu[illegible] [illegible]uum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1647	10.812 cf	75 °F	-2.60 "H_2O
Start	1633	0.000 cf	75 °F	-2.60 "H_2O
Avg.	14 ✓	10.812 ✓ cf	75 ✓ °F	-2.60 ✓ "H_2O

[illegible] Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	357.542 c[illegible]	[illegible] °F	84 °F	2.00 "H_2O
Start	347.309 c[illegible]	[illegible] °F	83 °F	2.00 "H_2O
Avg.	10.233 ✓ cf	88 ✓ °F		2.00 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.812 \left[\frac{29.76 + \frac{-2.60}{13.6}}{75 + 460} \right] \times 1.000 \ (C_f) = 10.547 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.233 \left[\frac{29.76 + \frac{2.00}{13.6}}{88 + 460} \right] = 9.857 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{10.547}{9.857} = \boxed{1.070 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 10-5-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0" H.O

P_b: 29.76 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	1700	11.024	cf	75	°F	-3.20	"H_2O
Start	1649	0.000	cf	75	°F	-3.20	"H_2O
Avg.	11 ✓	11.024 ✓	cf	75 ✓	°F	-3.20 ✓	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
End	368.291	cf	100	°F	85	°F	3.00	"H_2O
Start	357.851	cf	94	°F	84	°F	3.00	"H_2O
Avg.	10.440 ✓	cf	91 ✓	°F			3.00 ✓	"H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 11.024 \left[\frac{29.76 + \frac{-3.20}{13.6}}{75 + 460} \right] \times 1.000\ (C_f) = 10.738\ ✓\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 10.440 \left[\frac{29.76 + \frac{3.00}{13.6}}{91 + 460} \right] = 10.026\ ✓\ dcsf$$

$$C_{DG} = \frac{10.738}{10.026} = \boxed{1.071\ ✓}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 8-2

Date: 10-5-99

Calibrator: Shane Lee

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.0' 4.0

P_b: 29.76 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	1716	12.705	cf	75	°F	-4.00	"H_2O
Start	1704	0.000	cf	75	°F	-4.00	"H_2O
Avg.	12	12.705	cf	75	°F	-4.00	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
End	380.752	cf	102	°F	86	°F	4.00	"H_2O
Start	368.719	cf	94	°F	85	°F	4.00	"H_2O
Avg.	12.033	cf	92	°F			4.00	"H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 12.705 \left[\frac{29.76 + \frac{-4.00}{13.6}}{75 + 460}\right] \times 1000 \; (C_f) = 12.351 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 12.033 \left[\frac{29.76 + \frac{4.00}{13.6}}{92 + 460}\right] = 11.563 \text{ dcsf}$$

$$C_{DG} = \frac{12.351}{11.563} = \boxed{1.068}$$

METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 8-2

CALIBRATION DATA

Date: 10/5/99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1355	80	80
Ice Bath	1357	32	32
Boiling Water	1402	212	212
Oven	1405	250	250
Oven	1407	300	301
Oven	1410	350	351
Oven	1411	375	375

Meter Adjusted? Yes _____ No ✓

Calibrator: Shane Lee

Checked By: Scott Hart #268

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 11-07-99

ΔH ("H_2O)	C_{DG}
0.5	~~1.012~~ 1.015
1.0	1.018
1.5	1.022
2.0	1.019
3.0	1.011
4.0	1.002
Average	1.015

Variation: + 0.69%

- 1.28%

Calibrator: M. Buss

Checked By: Sam Brown

C_{DG} @ 2 liters/min. = _____

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 11-07-99

Calibrator: M. Buss

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5 " H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 2.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1310	5.015 cf	74 °F	-0.90 "H_2O
Start	1257	0.000 cf	74 °F	-0.90 "H_2O
Avg.	13	5.015 cf	74 °F	-0.900 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	572.057 cf	77 °F	76 °F	0.50 "H_2O
Start	567.114 cf	76 °F	75 °F	0.50 "H_2O
Avg.	4.943 cf	76 °F		0.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.015 \left[\frac{29.32 + \frac{-0.900}{13.6}}{74 + 460}\right] \times 1.000 \ (C_f) = 4.849 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 4.943 \left[\frac{29.32 + \frac{0.500}{13.6}}{76 + 460}\right] = 4.778 \text{ dcsf}$$

$$C_{DG} = \frac{4.849}{4.778} = \boxed{1.015}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: M. Bass

Date: 11-07-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0" H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 2.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1323	5.122 cf	74 °F	-1.30 "H_2O
Start	1314	0.000 cf	74 °F	-1.30 "H_2O
Avg.	9	5.122 cf	74 °F	-1.300 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	572.407 cf	78 °F	77 °F	1.00 "H_2O
Start	572.377 cf	77 °F	76 °F	1.00 "H_2O
Avg.	5.030 cf	77 °F		1.000 "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 5.122 \left[\frac{29.32 + \frac{-1.300}{13.6}}{74 + 460}\right] \times 1.000\ (C_f) = 4.948\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 5.030 \left[\frac{29.32 + \frac{1.000}{13.6}}{77 + 460}\right] = 4.859\ dcsf$$

$$C_{DG} = \frac{4.948}{4.859} = \boxed{1.018}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 11-07-99

Calibrator: M. Bass

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.5" H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 2.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1341	10.295 cf	74 °F	-1.60 "H_2O	587.724 cf	82 °F	77 °F	1.50 "H_2O
Start	1326	0.000 cf	74 °F	-1.60 "H_2O	577.653 cf	78 °F	76 °F	1.50 "H_2O
Avg.	15	10.295 cf	74 °F	-1.600 "H_2O	10.071 cf	78 °F		1.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.295 \left[\frac{29.32 + \frac{-1.600}{13.6}}{74 + 460}\right] \times 1.000 \ (C_f) = 9.937 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.071 \left[\frac{29.32 + \frac{1.500}{13.6}}{78 + 460}\right] = 9.724 \text{ dcsf}$$

$$C_{DG} = \frac{9.937}{9.724} = \boxed{1.022}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: M. Bass

Date: 11-07-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0" H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 2.50 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1356	10.300 cf	74 °F	-2.50 "H_2O
Start	1344	0.000 cf	74 °F	-2.50 "H_2O
Avg.	12	10.300 cf ✓	74 °F ✓	-2.500 "H_2O ✓

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	598.026 cf	86 °F	78 °F	2.00 "H_2O
Start	587.902 cf	81 °F	77 °F	2.00 "H_2O
Avg.	10.124 cf ✓	81 °F ✓		2.000 "H_2O ✓

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.300 \left[\frac{29.32 + \frac{-2.500}{13.6}}{74 + 460}\right] \times 1.000\,(C_t) = 9.919 \text{ dcsf} \checkmark$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.124 \left[\frac{29.32 + \frac{2.000}{13.6}}{81 + 460}\right] = 9.733 \text{ dcsf} \checkmark$$

$$C_{DG} = \frac{9.919}{9.733} = \boxed{1.019} \checkmark$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 11-07-99

Calibrator: M. Bass

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0" H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 3.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1408	10.330 cf	74 °F	-2.90 "H_2O
Start	1358	0.000 cf	74 °F	-2.90 "H_2O
Avg.	10	10.330 cf ✓	74 °F ✓	-2.900 "H_2O ✓

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	608.602 cf	89 °F	79 °F	3.00 "H_2O
Start	598.364 cf	85 °F	78 °F	3.00 "H_2O
Avg.	10.238 cf ✓	83 °F ✓		3.000 "H_2O ✓

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.330 \left[\frac{29.32 + \frac{-2.90}{13.6}}{74 + 460}\right] \times 1.000\ (C_f) = 9.938 \text{ dcsf} \checkmark$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.238 \left[\frac{29.32 + \frac{3.000}{13.6}}{83 + 460}\right] = 9.831 \text{ dcsf} \checkmark$$

$$C_{DG} = \frac{9.938}{9.831} = \boxed{1.011} \checkmark$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: M. Buss

Date: 11-07-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.0" H_2O

P_b: 29.32 "Hg

Control Module Vacuum: 3.00 "Hg

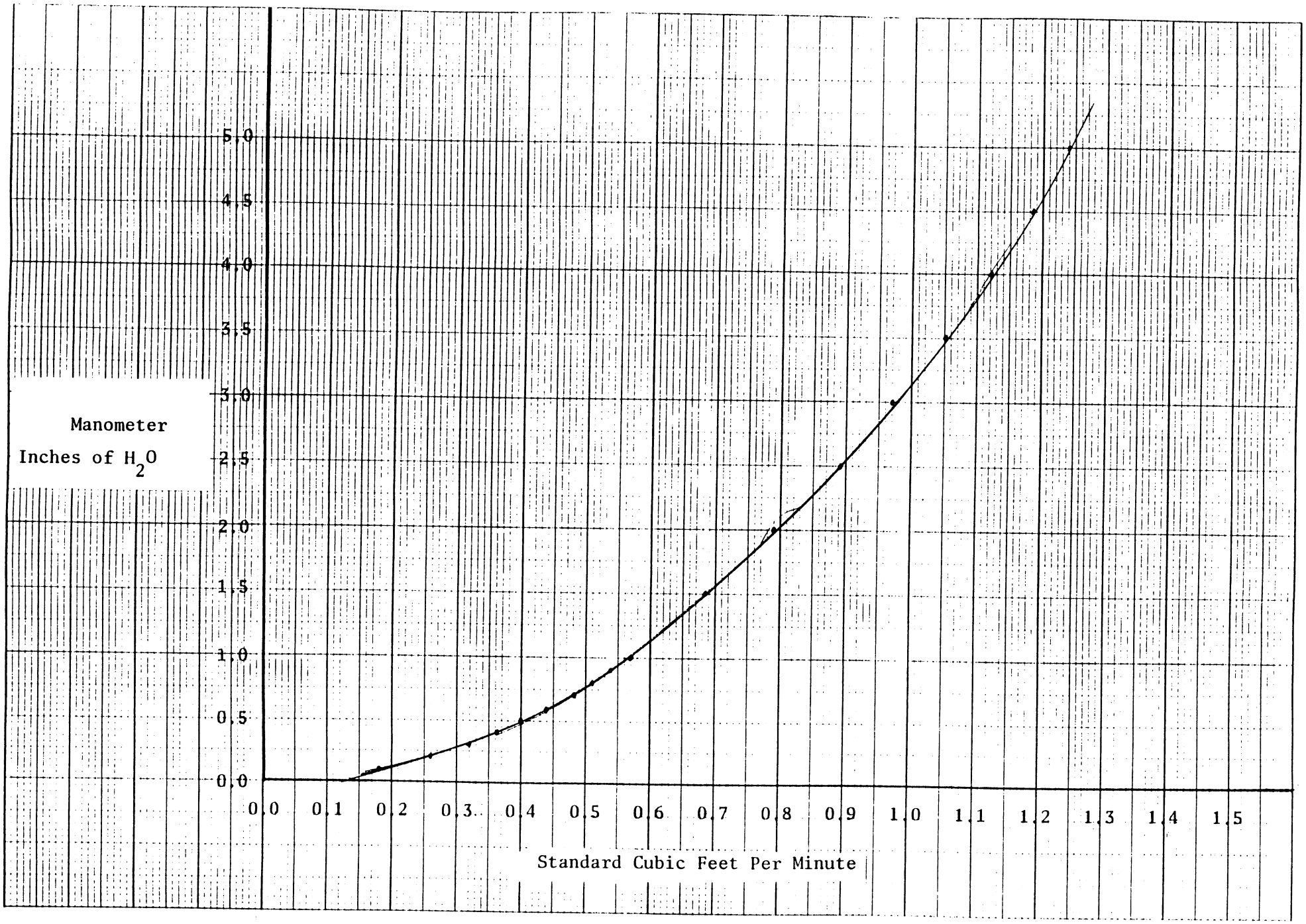
Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1419	10.130 cf	74 °F	-3.70 "H_2O	619.031 cf	91 °F	80 °F	4.00 "H_2O
Start	1410	0.000 cf	74 °F	-3.70 "H_2O	608.926 cf	87 °F	79 °F	4.00 "H_2O
Avg.	9	10.130 cf ✓	74 °F ✓	-3.700 "H_2O ✓	10.105 cf ✓	84 ✓ °F		4.000 "H_2O ✓

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.130 \left[\frac{29.32 + \frac{-3.700}{13.6}}{74 + 460}\right] \times 1000 \quad (C_f) = 9.726 \text{ dcsf} \checkmark$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.105 \left[\frac{29.32 + \frac{4.000}{13.6}}{84 + 460}\right] = 9.709 \text{ dcsf} \checkmark$$

$$C_{DG} = \frac{9.726}{9.709} = \boxed{1.002} \checkmark$$

Cal = 27.2 11-7-99 Cal f = 1.015



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

Date: 11-07-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1248	77	75 ✓
Ice Bath	1250	36	36 ✓
Boiling Water	1300	210	211 ✓
Oven	1302	250	250 ✓
Oven	1304	300	301 ✓
Oven	1306	352	351 ✓
Oven	1308	376	378 ✓

Meter Adjusted? Yes _____ No ✓

Calibrator: Mike Bass

Checked By: Jorn Brown

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 10-4-99

Time: 1520

Barometric Pressure @ Addison Airport @ 719 ft.	=	30.210
	-	0.719
Absolute Pressure @ Addison Airport	=	29.491
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.574
Barometer Reading	=	29.610
Variation	=	0.036

Barometer Adjusted? Yes ✓ No _____

Shane Lee 261

Signature of Calibrator

APPENDIX D

Analytical Data

TestAmerica
INCORPORATED

November 23, 1999

Doug Saathoff
METCO Environmental
P.O. Box 598
Addison, Texas 75001

DAB 12/2/99
99-95 WHSL

NOV 29 1999

Dear Doug,

Please find included with this letter the analytical report and data package for the WH Sammis Power Plant samples submitted to TestAmerica for analysis. The samples were analyzed following the SOPs based on the Ontario-Hydro Method and ASTM 6414-99.

Case Narrative

TestAmerica received the samples intact on September 25, 1999. Several items were noted:

- Sample containers did not have the volume marked on the side.
- There was two thimble filters for Unit 1 Baghouse Inlet Run #3. The particulate from the two thimbles was composited prior to removing an aliquot for analysis.
- The backup filter blank was not analyzed with the back up filters due to an analytical error. The backup filter blank was redigested and analyzed on a later run outside of hold time. No Mercury was detected in any of the backup filters or in the backup blank.
- The matrix spike (74 % recovery) of Container #2 from the Unit 1 Baghouse Inlet Duct Run #1 was outside the control limits (75 %-125 % recovery).
- The matrix spikes for Container #1A frpom the Unit 1 Baghouse Inlet Duct Run #1 and Run #3 were diluted out due to high levels of Mercury in the sample.

No other problems were noted during analysis. If you have any questions or need additional information about this data package, please feel free to contact me at 937-294-6856.

Sincerely,

James A. Davis

James A. Davis
QA Coordinator

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Hg Analysis
Ontario Hydro Method

Summary Report

	Unit 1 Baghouse South Outlet Duct Run 1	Unit 1 Baghouse South Outlet Duct Run 2	Unit 1 Baghouse South Outlet Duct Run 3	Unit 1 Baghouse Inlet Duct Run 1	Unit 1 Baghouse Inlet Duct Run 2	Unit 1 Baghouse Inlet Duct Run 3
Particle Bound Hg (ug)	0.013	0.017	0.028	17.10	23.30	21.30
Oxidized Hg (ug)	0.00	0.00	0.00	0.00	0.00	0.00
Elemental Hg (ug)	0.00	0.00	0.00	0.00	0.00	0.00
Total Hg (ug)	0.01	0.02	0.03	17.10	23.30	21.30

	Unit 1 Baghouse Inlet Blank (Run 2)	Unit 1 Baghouse South Outlet Blank (Run 2)
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	0.00	0.00
Elemental Hg (ug)	0.00	0.00
Total Hg (ug)	0.00	0.00

	Reagent Blanks
Container # 7 (ug/L)	<0.2
Container # 8 (ug/L)	<2.0
Container # 9 (ug/L)	<4.0
Container # 10 (ug/L)	<2.0
Container # 11 (ug/L)	<0.2
Container # 12 (ug)	<0.010

Corrected Page - 1/17/00

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Hg Analysis
Ontario Hydro Method

Duplicate Summary Report

	Unit 1 Baghouse South Outlet Duct Run 1	Unit 1 Baghouse South Outlet Duct Run 2	Unit 1 Baghouse South Outlet Duct Run 3	Unit 1 Baghouse Inlet Duct Run 1	Unit 1 Baghouse Inlet Duct Run 2	Unit 1 Baghouse Inlet Duct Run 3
Particle Bound Hg (ug)	0.014	0.017	0.028	17.20	22.20	20.30
Oxidized Hg (ug)	0.00	0.00	0.00	0.00	0.00	0.00
Elemental Hg (ug)	0.00	0.00	0.00	0.00	0.00	0.00
Total Hg (ug)	0.01	0.02	0.03	17.20	22.20	20.30

	Unit 1 Baghouse Inlet Blank (Run 2)	Unit 1 Baghouse South Outlet Blank (Run 2)
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	0.00	0.00
Elemental Hg (ug)	0.00	0.00
Total Hg (ug)	0.00	0.00

	Reagent Blanks
Container # 7 (ug/L)	<0.2
Container # 8 (ug/L)	<2.0
Container # 9 (ug/L)	<4.0
Container # 10 (ug/L)	<2.0
Container # 11 (ug/L)	<0.2
Container # 12 (ug)	<0.010

Corrected Page - 1/17/00

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse South Outlet Duct Run 1

Hg Analysis
Ontario Hydro Method

ollected On: 9/23/99
Collected By: METCO

ontainer # 1A - Main Filter
Container # 1B - Backup Filter
ontainer # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
ontainer # 1A	ST-55	11/04/99	11/05/99	jpp	0.013	0.014	7	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
ontainer # 2	ST-2	11/05/99	11/05/99	jpp	<0.094	<0.094	0	---	---	ug		
ontainer # 3	ST-9	11/05/99	11/05/99	jpp	<1.44	<1.44	0	---	---	ug		
Container # 4	ST-20	11/05/99	11/05/99	jpp	<0.720	<0.720	0	---	---	ug		
Container # 5	ST-27	11/05/99	11/05/99	jpp	<1.04	<1.04	0	---	---	ug		

Particle Bound Hg (ug) **0.013**
ontainers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **0.01**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.014**
ontainers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **0.01**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse South Outlet Duct Run 2

Hg Analysis
Ontario Hydro Method

Collected On: 9/24/99
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	ST-54	11/04/99	11/05/99	jpp	0.017	0.017	0	---	---	ug		
Container # 1B		Not Provided		jpp	N/A	---	---	---	---	ug		
Container # 2	ST-4	11/05/99	11/05/99	jpp	<0.166	<0.166	0	---	---	ug		
Container # 3	ST-13	11/05/99	11/05/99	jpp	<1.76	<1.76	0	---	---	ug		
Container # 4	ST-22	11/05/99	11/05/99	jpp	<0.620	<0.620	0	---	---	ug		
Container # 5	ST-30	11/05/99	11/05/99	jpp	<1.01	<1.01	0	---	---	ug		

Particle Bound Hg (ug) **0.017**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **0.02**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.017**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **0.0**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse South Outlet Duct Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 9/24/99
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	ST-53	11/04/99	11/05/99	jpp	0.028	0.028	0	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2	ST-6	11/05/99	11/05/99	jpp	<0.076	<0.076	0	---	---	ug		
Container # 3	ST-17	11/05/99	11/05/99	jpp	<1.43	<1.43	0	---	---	ug		
Container # 4	ST-24	11/05/99	11/05/99	jpp	<0.560	<0.560	0	---	---	ug		
Container # 5	ST-32	11/05/99	11/05/99	jpp	<1.02	<1.02	0	---	---	ug		

Particle Bound Hg (ug) **0.028**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **0.03**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.028**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **0.03**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse Inlet Duct Run 1

Hg Analysis
Ontario Hydro Method

ollected On: 9/23/99
Collected By: METCO

ontainer # 1A - Main Filter
Container # 1B - Backup Filter
ontainer # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
ontainer # 1A	ST-46	11/04/99	11/05/99	jpp	17.1	17.2	1	17.5	2	ug	*1	
Container # 1B	ST-47	11/04/99	11/05/99	jpp	<0.010	<0.010	0	---	---	ug		
ontainer # 2	ST-1	11/05/99	11/05/99	jpp	<0.120	<0.120	0	---	---	ug	*2	
ontainer # 3	ST-7	11/05/99	11/05/99	jpp	<1.39	<1.39	0	---	---	ug		
ontainer # 4	ST-19	11/05/99	11/05/99	jpp	<0.600	<0.600	0	---	---	ug		
Container # 5	ST-25	11/05/99	11/05/99	jpp	<1.12	<1.12	0	---	---	ug		

Particle Bound Hg (ug) **17.10**
(ontainers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **17.10**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **17.20**
(ontainers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **17.20**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 - Spike was diluted out.

* 2 - Spike recovery (74 %) was outside control limits (75 % -125 %).

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse Inlet Duct Run 2

Hg Analysis
Ontario Hydro Method

ollected On: 9/24/99
Collected By: METCO

ontainer # 1A - Main Filter
Container # 1B - Backup Filter
ontainer # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
ontainer # 1A	ST-48	11/04/99	11/05/99	jpp	23.3	22.2	5	---	---	ug		
Container # 1B	ST-49	11/04/99	11/05/99	jpp	<0.010	<0.010	0	---	---	ug		
Container # 2	ST-3	11/05/99	11/05/99	jpp	<0.160	<0.160	0	---	---	ug		
ontainer # 3	ST-11	11/05/99	11/05/99	jpp	<1.52	<1.52	0	<1.52	0	ug		
ontainer # 4	ST-21	11/05/99	11/05/99	jpp	<0.640	<0.640	0	---	---	ug		
Container # 5	ST-29	11/05/99	11/05/99	jpp	<1.00	<1.00	0	---	---	ug		

Particle Bound Hg (ug) **23.30**
ontainers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **23.30**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **22.20**
ontainers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **22.20**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse Inlet Duct Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 9/24/99
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	ST-51	11/04/99	11/05/99	jpp	21.3	20.3	5	20.9	2	ug	*1	
Container # 1B	ST-52	11/04/99	11/05/99	jpp	<0.010	<0.010	0	—	—	ug		
Container # 2	ST-5	11/05/99	11/05/99	jpp	<0.140	<0.140	0	—	—	ug		
Container # 3	ST-15	11/05/99	11/05/99	jpp	<1.49	<1.49	0	—	—	ug		
Container # 4	ST-23	11/05/99	11/05/99	jpp	<0.580	<0.580	0	<0.580	0	ug		
Container # 5	ST-31	11/05/99	11/05/99	jpp	<0.920	<0.920	0.0	—	—	ug		

Particle Bound Hg (ug) **21.30**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **21.30**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **20.30**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **20.30**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 - Spike was diluted out.

Corrected Page - 1/17/00

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse Inlet Blank (Run 2)

Hg Analysis
Ontario Hydro Method

Collected On: 9/24/99
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided		jpp	---	---	---	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2		Not Provided		jpp	---	---	---	---	---	ug		
Container # 3	ST-39	11/05/99	11/05/99	jpp	<0.940	<0.940	0	<0.940	0	ug		
Container # 4	ST-41	11/05/99	11/05/99	jpp	<0.600	<0.600	0	---	---	ug		
Container # 5	ST-43	11/05/99	11/05/99	jpp	<0.950	<0.950	0	---	---	ug		

Particle Bound Hg (ug) **0.00**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **0.0**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.00**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **0.0**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Unit 1 Baghouse South Outlet Blank (Run 2)

Hg Analysis
Ontario Hydro Method

Collected On: 9/24/99
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided		jpp	---	---	---	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2		Not Provided		jpp	---	---	---	---	---	ug		
Container # 3	ST-38	11/05/99	11/05/99	jpp	<0.900	<0.900	0	---	---	ug		
Container # 4	ST-40	11/05/99	11/05/99	jpp	<0.560	<0.560	0	---	---	ug		
Container # 5	ST-42	11/05/99	11/05/99	jpp	<0.900	<0.900	0	---	---	ug		

Particle Bound Hg (ug) **0.00**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **0.00**
(Containers 3)

Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Total Hg (ug) **0.0**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.00**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **0.00**
(Containers 3)

Dup. Elemental Hg (ug) **0.00**
(Containers 4 and 5)

Dup. Total Hg (ug) **0.0**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: **Ohio Edison Power Company**
WH Sammis Power Plant
Stratton, OH
Reagent Blanks

Hg Analysis
Ontario Hydro Method

Collected On: 9/23/99 (9/24/99 for Filter Blank)
Collected By: METCO

Container # 7 - 0.1 N HNO_3 Blank
Container # 8 - 1 N KCl Blank
Container # 9 - 5 % HNO_3/10 % H_2O_2 Blank
Container # 10 - H_2SO_4-/$KMnO_4$ Blank
Container # 11 - 10 % Hydroxylamine Sulfate/Sodium Chloride Blank
Container # 12 Filter Blank

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 7	ST-33	N/A	11/05/99	jpp	<0.2	<0.2	0	<0.2	0	ug/L		
Container # 8	ST-34	11/05/99	11/05/99	jpp	<2.0	<2.0	0	---	---	ug/L		
Container # 9	ST-35	11/05/99	11/05/99	jpp	<4.0	<4.0	0	---	---	ug/L		
Container # 10	ST-36	11/05/99	11/05/99	jpp	<2.0	<2.0	0	---	---	ug/L		
Container # 11	ST-37	N/A	11/05/99	jpp	<0.2	<0.2	0	---	---	ug/L		
Container # 12	ST-44	11/13/99	11/15/99	jpp	<0.010	<0.010	0	---	---	ug		

*1 It was not neceassy to analyze a thimble balnk as only the particulate matter was digested.

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

Mercury Sample Train Receipt Records

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Sammis Power Plant	OUTLET
Stratton, OH	RUT #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	47 + – + – = 47.	ST 2	
☑ 3 (2)	490 + 230 + – = 720.	ST 9A, 9B	
☑ 4 (1)	180 + – + – = 180.	ST 20	
☑ 5 (2)	435 + 83 + – = 518.	ST 27A, 27B	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☑ 1B (1)	47Q26	ST 5.5	
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS MARKED ON BTLS

Checked By: [illegible] Date: 11/2/09

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Shammis Power Plant	OUTLET
Stratton, OH	RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	83 + – + – = 83.	ST 4	
☑ 3 (2)	470 + 410 + – = 880.	ST 13A, 13B	
☑ 4 (1)	155 + – + – = 155.	ST 22	
☑ 5 (1)	505 + – + – = 505.	ST 30	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☑ 1B (1)	47029	ST 54	
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS. MARKED ON BTLS.

Checked By: MP Date: 11/2/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Sammis Power Plant	OUTLET
Stratton, OH	RUN #3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	38 + – + – = 38.	ST 6	
☑ 3 (2)	410 + 305 + – = 715.	ST 17A, 17B	
☑ 4 (1)	140 + – + – = 140.	ST 24	
☑ 5 (1)	510 + – + – = 510.	ST 32	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☑ 1B (1)	47Q27	ST 53	
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS MARKED ON BTLS.

Checked By: MB Date: 11/12/09

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Shammis Power Plant	INLET
Stratton, OH	RUN #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	___ + ___ + ___ = 60.	ST-1	
☑ 3 (2)	490 + 205 + – = 695.	ST-7A, 7B	
☑ 4 (1)	___ + ___ + ___ = 150.	ST-19	
☑ 5 (2)	500 + 60 + – = 560.	ST-25A, 25B	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☑ 1A (1)	Q1	ST 46	
☑ 1B (1)	47Q25	ST 47	
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS. MARKED ON BTLS

Checked By: MP Date: 11/2/95

TestAmerica

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Shammis Power Plant	INLET
Stratton, OH	RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	80 + – + – = 80.	ST-3	
☑ 3 (2)	510 + 250 + – = 760.	ST 11A, 11B	
☑ 4 (1)	160 + – + – = 160.	ST 21	
☑ 5 (1)	500 + – + – = 500.	ST 29	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☑ 1A (1)	Q2	ST 48	
☑ 1B (1)	47Q28	ST 49	
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS. MARKED ON BTLS

Checked By: MP Date: 11/2/95

TestAmerica

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Shammis Power Plant	INLET
Stratton, OH	RUN#3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☑ 2 (1)	70 + – + – = 70.	ST 5	
☑ 3 (2)	500 + 245 + – = 745.	ST 15A, 15B	
☑ 4 (1)	145 + – + – = 145.	ST 23	
☑ 5 (1)	460 + – + – = 460.	ST 31	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☑ 1A (2)	Q12, Q8	ST 51A, 51B	
☑ 1B (1)	47230	ST 52	
☐ 12A ( )			
☐ 12B ( )			

Notes: No vols marked on BTLS.

Checked By: [illegible] Date: 11/2/05

TestAmerica

Mercury Sample Train Receipt Record

Client ID
Ohio Edison Power Plant
W.H. Sammis Power Plant
Stratton, OH

Location ID/Run #
Unit 1 Baghouse
SOUTH OUTLET
REAGENT BLANKS

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___ .		
☐ 3 ( )	___ + ___ + ___ = ___ .		
☐ 4 ( )	___ + ___ + ___ = ___ .		
☐ 5 ( )	___ + ___ + ___ = ___ .		
☑ 7 (1)	___ + ___ + ___ = 50 .	ST 33	* **
☑ 8 (1)	___ + ___ + ___ = 50 .	ST 34	
☑ 9 (1)	___ + ___ + ___ = 51 .	ST 35	
☑ 10 (1)	___ + ___ + ___ = 50 .	ST 36	
☑ 11 (1)	___ + ___ + ___ = 100 .	ST 37	

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☑ 12A (3)	Q5, Q7, Q17	ST 45A, 45B, 45C	
☑ 12B (3)	47Q31, 47Q32, 47Q33	ST 44A, 44B, 44C	

Notes: * VOLS TAKEN FROM COC
** NO VOLS. MARKED ON BTLS

Checked By: MB Date: 11/2/05

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
Ohio Edison Power Plant
W.H. Shammis Power Plant
Stratton, OH

Location ID/Run #
Unit 1 Baghouse
BLANK TRAIN
INLET
RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___ .		
☑ 3 (1)	450 + – + – = 450 .	ST 38	
☑ 4 (1)	140 + – + – = 140 .	ST 40	
☑ 5 (1)	450 + – + – = 450 .	ST 42	
☐ 7 ( )	___ + ___ + ___ = ___ .		
☐ 8 ( )	___ + ___ + ___ = ___ .		
☐ 9 ( )	___ + ___ + ___ = ___ .		
☐ 10 ( )	___ + ___ + ___ = ___ .		
☐ 11 ( )	___ + ___ + ___ = ___ .		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS. MARKED ON BTLS

Checked By: [illegible] Date: 11/2/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
Ohio Edison Power Plant	Unit 1 Baghouse
W.H. Sammis Power Plant	BLANK TRAIN
Stratton, OH	OUTLET
	RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___.		
☑ 3 ( )	470 + — + — = 470.	ST 39	
☑ 4 ( )	150 + — + — = 150.	ST 41	
☑ 5 ( )	475 + — + — = 475.	ST 43	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☐ 12A ( )			
☐ 12B ( )			

Notes: NO VOLS MARKED ON BTLS.

Checked By: MP Date: 11/2/96

TestAmerica INCORPORATED

Sample Preparation Batch Sheets

NONAQUEOUS MERCURY BATCH SHEET

Analyst: [illegible] Date: 10/18/95 Water Bath: start mid end

Standard Reference: 65-21-11 temp: _____

ICV Reference: 65-21-12 date: _____

	Sample # / Client	Weight	MS	MSD
1	BLANK			
2	SAMMIS RUN #1	1.0186	45.10	
3	SAMMIS RUN #2	1.0454	47.83	MB
4	SAMMIS RUN #3	1.0394	48.10	
5	BMP RUN #1	1.0640	47.00	
6	BMP RUN #2	1.0656	46.97	
7	BMP RUN #3	1.0364	48.24	ICV
1	NIST 1630A	1.1889	42.05	
8	LCS	50uL → 50mL		
				MS
				MSD
				RPD
				FLAG

SECONDARY DATA CHECK: analyst:
date:

Comments: _____

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) [illegible] Preparation Date 11/5/99

Reagent Reference #'s

HCl	65-34-2	$SnCl_2$	65-34-4
$NH_2OH*HCl$	65-30-11	Calibration Standards	65-32-9
$KMnO_4$	65-33-11	ICV Standard	65-32-10
HNO_3	65-33-14	$K_2S_2O_8$	34-43-16

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
BLK					
ST1	2	INLET #1 0.1N HNO3	60.0	5.0	50.0
SPK ST1	2	INLET #1	60.0	5.0	50.0
ST2	2	OUTLET #1	47.0	5.0	50.0
ST3	2	INLET #2	80.0	5.0	
ST4	2	OUTLET #2	83.0	5.0	
ST5	2	INLET #3	70.0	5.0	
ST6	2	OUTLET #3	38.0	5.0	50.0
ST7 A+B	3	INLET #1 KCL 10% HNO3	695	5.0	50.0
~~ST8 A+B~~ 11/8 KMnO4		—	—	—	—
ST9 A+B	3	OUTLET #1	720	5.0	50.0
ST11 A+B	3	INLET #2	760	5.0	50.0
ST13 A+B	3	OUTLET #2	880	5.0	50.0
ST15 A+B	3	INLET #3	745	5.0	50.0
ST17 A+B	3	OUTLET #3	715	5.0	50.0
ST34	8	1N KCl BLANK	50.0	5.0	50
ST38	3	BLANK TRAIN INLET #2	450	5.0	50
ST39	3	BLANK TRAIN OUTLET #2	470	5.0	50

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
* ST36	10	H2SO4/KMnO4 Blank	50.0	5.0	50.0
ST25	5	H2SO4/KMnO4 IMP 5,6,7	560	5.0	50.0
ST27	5	OUTLET #1	518	5.0	50.0
ST29	5	INLET #2	500	5.0	50.0
ST30	5	OUTLET #2	505	5.0	50.0
ST31	5	INLET #3	460	5.0	50.0
ST32	5	OUTLET #3	510	5.0	50.0
ST42	5	BLANK TRAIN INLET #2	450	5.0	50.0
ST43	5	BLANK TRAIN OUTLET #2	475	5.0	50.0
ST33	7	REAGENT BLANK 0.1N HNO3	50	—	—
ST33 SPK					
* ST36 SPK	10	H2SO4/KMnO4 BLANK	50.0	5.0	50.0
ST37	11	10% NH2OH·HCl BLANK	100	11/8 ~~5.0~~	—
ST37 SPK	11	" " "	100	—	—
ST35	9	HNO3/H2O2 BLANK	51	2.5	50.0
ST19	4	INLET RUN #1	150	2.5	50.0
ST20	4	OUTLET RUN #1	180	2.5	50.0
ST21	4	INLET #2	160	2.5	50.0
ST22	4	OUTLET #2	155	2.5	50.0
ST23	4	INLET #3	145	2.5	50.0

NOTES ST 36 SPK OUT OF ORDER

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) TRP Preparation Date 11/5/99

Reagent Reference #'s

HCl	65-34-2	$SnCl_2$	65-34-4
$NH_2OH*HCl$	65-32-11	Calibration Standards	65-32-9
$KMnO_4$	65-33-11	ICV Standard	65-32-10
HNO_3	65-33-14	$K_2S_2O_8$	34-43-66

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
STD4	4	OUTLET #3	140	2.5	50.0						
STD0	4	INLET RUN #2 BLANK	140	2.5	50.0						
STD1	4	OUTLET #2 BLANK MAIN	150	2.5	50.0						

NOTES

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 09:43:06  20 Oct 1999
Folder: OCT99B      Seq: 108                     Print: On
User:               Batch:            Id: Std6Rep1   Cuo: 1 22 Gas:    0.23 LPM
State: Idle                                        Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 1002099a
cuo Id          Extended id          Weight Volume Macro check Help
 1 icb                               1.0000 1.0000
 2 Blank                             1.0000 1.0000
 3 LCS                               1.0000 1.0000
 4 NIST 1630a                        1.0000 1.0000
 5 NIST duo                          1.0000 1.0000
 6 Sammis#1                          1.0000 1.0000
 7 Sam #1 duo                        1.0000 1.0000
 8 Sammis #2                         1.0000 1.0000
 9 Sam #2 duo                        1.0000 1.0000
10 ccb                               1.0000 1.0000
11 ccv                               1.0000 1.0000
12 Sammis #3                         1.0000 1.0000
13 Sam #3 duo                        1.0000 1.0000
14 BMP #1                            1.0000 1.0000
15 BMP #1 duo                        1.0000 1.0000
                                                                    PgDn
```

```
Cuo 1  ID: icb                                  Call entry, Ins to switch
```

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 09:43:10  20 Oct 1999
Folder: OCT99B      Seq: 108                     Print: On
User:               Batch:            Id: StdcRep1   Cup: 1 22 Gas:    0.23 LPM
State: Idle                                        Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 102099a                                    PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 BMP #2                            1.0000 1.0000
17 BMP #2 dup                        1.0000 1.0000
18 BMP #3                            1.0000 1.0000
19 BMP #3 dup                        1.0000 1.0000
20 BMP #3 trp                        1.0000 1.0000
21 ccc                               1.0000 1.0000
22 ccv                               1.0000 1.0000
23                                   1.0000 1.0000
24                                   1.0000 1.0000
25                                   1.0000 1.0000
26                                   1.0000 1.0000
27                                   1.0000 1.0000
28                                   1.0000 1.0000
29                                   1.0000 1.0000
30                                   1.0000 1.0000
                                                                          PgDn

Cup 16 ID: BMP #2                                   Call entry, Ins to switch
```

*** Standard: 1 Rep: 1 Seq: 102 09:23:06 20 Oct 1999 HG

Hg .000 ug/L 67
Ave. Int. = 67 S. D. = 0

Folder: OCT99B Page 404
09:25:28 20 Oct 1999 Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 2 Rep: 1 Seq: 103 09:25:28 20 Oct 1999 HG

Hg .200 ug/L 3610
Ave. Int. = 3610 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 104 09:27:52 20 Oct 1999 HG

Hg .500 ug/L 8847
Ave. Int. = 8847 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 105 09:30:26 20 Oct 1999 HG

Hg 1.00 ug/L 19245
Ave. Int. = 19245 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 106 09:32:09 20 Oct 1999 HG

Hg 2.00 ug/L 39758
Ave. Int. = 39758 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 107 09:36:01 20 Oct 1999 HG

Hg 3.00 ug/L 58173
Ave. Int. = 58173 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 09:37:01 20 Oct 1999

Folder: OCT99B Seq: 108 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 22 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

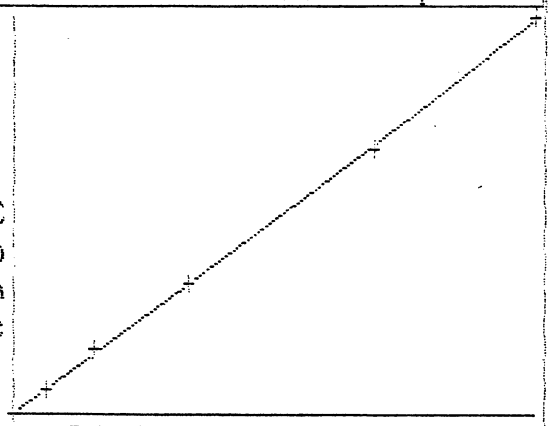
Line: Hg

	Conc.	Calc.	Dev.	Accepted
S1	.000	.019	.019	LiNear
S2	.200	.199	-.001	Quadratic
S3	.500	.466	-.034	WtdLinear
S4	1.00	.996	-.004	Accept
S5	2.00	2.04	.041	
S6	3.00	2.98	-.021	StdAdd

A .0000000 r .999733

B 5.09358e-5 C 1.56054e-2

	Mean	%RSD	
S1	67	0	67
S2	3610	0	3610
S3	8847	0	8847
S4	19245	0	19245
S5	39758	0	39758
S6	58173	0	58173



New calibration coefficients stored

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2 Seq: 108 09:44:46 20 Oct 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		104.	.631	.604	ug/L	.000

104%

*** Sample ID: icb Seq: 109 09:47:18 20 Oct 1999 HG

Hg -.015 ug/L .000 -.015 < 0.01 µg/g ~~<0.008 mg/kg~~ DRP 10/20/99

~~<0.008 µg/g~~ DRP 10/20/

*** Sample ID: Blank Seq: 110 09:49:35 20 Oct 1999 HG

Hg .037 ug/L .000 .037 <0.01 µg/g ~~<0.008 mg/kg~~ w/w/99

*** Sample ID: LCS Seq: 111 09:51:52 20 Oct 1999 HG

Hg 1.03 ug/L .000 1.03 103%

*** Sample ID: NIST 1630a Seq: 112 09:54:34 20 Oct 1999 HG

Hg 1.79 ug/L .000 1.79 0.087 µg/g

RANGE - 0.074 — 0.138 µg/g

RPD - NA

*** Sample ID: NIST dup Seq: 113 09:57:15 20 Oct 1999 HG

Hg 1.79 ug/L .000 1.79 0.087 µg/g

*** Sample ID: Sammies#1 Seq: 114 10:00:03 20 Oct 1999 HG

Hg 1.54 ug/L .000 1.54 0.076 µg/g wet wt.

0.080 µg/g dry

RPD = 0.0

*** Sample ID: Sam #1 dup Seq: 115 10:02:44 20 Oct 1999 HG

Hg 1.53 ug/L .000 1.53 0.076 µg/g wet

0.079 µg/g Dry

*** Sample ID: Sammie #2 Seq: 116 10:05:25 20 Oct 1999 HG

Hg 1.59 ug/L .000 1.59 0.079 µg/g wet

0.084 µg/g Dry

RPD = 3.7%

*** Sample ID: Sam #2 dup Seq: 117 10:08:04 20 Oct 1999 HG

Hg 1.65 ug/L .000 1.65 0.082 µg/g wet

0.086 µg/g Dry

*** Sample ID: ccb Seq: 118 10:10:46 20 Oct 1999 HG

Hg -.018 ug/L .000 -.018 <0.01 µg/g

*** Sample ID: ccv Seq: 119 10:13:05 20 Oct 1999 HG

Hg 2.16 ug/L .000 2.16 108%

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Sammis #3					Seq: 120	10:15:47 20 Oct 1999 HG-1		
Hg	1.55	ug/L	.000	1.55				
*** Sample ID: Sam #3 dup					Seq: 121	10:18:27 20 Oct 1999 HG		
Hg	1.52	ug/L	.000	1.52				
*** Sample ID: EMP #1					Seq: 122	10:21:06 20 Oct 1999 HG		
Hg	1.76	ug/L	.000	1.76				
*** Sample ID: EMP #1 dup					Seq: 123	10:23:47 20 Oct 1999 HG		
Hg	1.79	ug/L	.000	1.79				
*** Sample ID: EMP #2					Seq: 124	10:26:30 20 Oct 1999 HG		
Hg	1.34	ug/L	.000	1.34				
*** Sample ID: EMP #2 dup					Seq: 125	10:29:06 20 Oct 1999 HG		
Hg	1.36	ug/L	.000	1.36				
*** Sample ID: EMP #3					Seq: 126	10:31:46 20 Oct 1999 HG		
Hg	2.20	ug/L	.000	2.20				
*** Sample ID: EMP #3 dup					Seq: 127	10:34:28 20 Oct 1999 HG		
*** Sample ID: EMP #3 trip			.000		Seq: 128	10:37:10 20 Oct 1999 HG		
Hg	2.15	ug/L	.000	2.15				
*** Sample ID: EMP					Seq: 129	10:39:53 20 Oct 1999 HG		
Hg	[illegible]	ug/L	.000	[illegible]				
*** Sample ID: EMP #2					Seq: 130	10:42:30 20 Oct 1999 HG		
Hg	2.10	ug/L	.000	2.10				
*** Sample ID: EMP #3 dup					Seq: 131	10:45:17 20 Oct 1999 HG		
Hg	2.10	ug/L	.000	2.10				

0.077 ug/g wet
0.081 ug/g Dry
RPD = 1.95

0.075 ug/g Wet
0.079 ug/g Dry

0.083 ug/g Wet
0.088 ug/g Dry
RPD = 1.6

0.085 ug/g wet
0.089 ug/g Dry

0.062 ug/g Wet
0.066 ug/g Dry
RPD = 1.48

0.063 ug/g wet
0.067 ug/g Dry

Printer malfunction SRP w/ 120/125

0.097 ug/g wet
0.102 ug/g Dry
RPD - N/A

0.097 ug/g wet
0.102 ug/g Dry

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: BKF #3 wro					Seq: 132	10:45:15 20 Oct 1999 HG		
Hg	2.19	ug/L	.000	2.19				
*** Sample ID: ccb					Seq: 133	10:51:01 20 Oct 1999 HG		
Hg	-.022	ug/L	.000	-.022				
*** Sample ID: ccv					Seq: 134	10:53:19 20 Oct 1999 HG		
Hg	2.13	ug/L	.000	2.13				

RPD = 4.2

~~0.101 µg/g~~ wet

0.106 µg/g Dry

<0.01 µg/g

107%

11/05/99 Analytical Run

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 15:11:16  05 Nov 1999
Folder: NOVA99      Seq: 302                    Print: On
User:               Batch:            Id: CK2        Cup: 1 06 Gas:    0.23 LPM
State: Idle                                        Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A
cup Id        Extended id        Weight Volume Macro check Help
 1 icb                           1.0000 1.0000
 2 blk                           1.0000 1.0000
 3 blk cup                       1.0000 1.0000
 4 ST 1                          1.0000 1.0000
 5 ST 1 DUP                      1.0000 1.0000
 6 ST 1 SPK                      1.0000 1.0000
 7 ST 2                          1.0000 1.0000
 8 ST 2 DUP                      1.0000 1.0000
 9 ST 3                          1.0000 1.0000
10 ST 3 DUP                      1.0000 1.0000
11 ST 4                          1.0000 1.0000
12 ST 4 DUP                      1.0000 1.0000
13 ST 5                          1.0000 1.0000
14 ST 5 DUP                      1.0000 1.0000
15 ST 6                          1.0000 1.0000
                                                                    PgDn
```

```
Cup 1  ID: icb                                  Call entry, Ins to switch
```

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 15:11:25  05 Nov 1999
Folder: NOVA99      Seq: 302                     Print: On
User:               Batch:            Id: CK2        Cup: 1 06 Gas:    0.23 LPM
State: Idle                                          Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A                                    PgUp
cup Id          Extended id          weight Volume Macro check Help
16 ST 6 DUP                          1.0000 1.0000
17 ST 7                              1.0000 1.0000
18 ST 7 DUP                          1.0000 1.0000
19 ST 9                              1.0000 1.0000
20 ST 9 DUP                          1.0000 1.0000
21 ST 11                             1.0000 1.0000
22 ST 11 DUP                         1.0000 1.0000
23 ST 11 TRP                         1.0000 1.0000
24 CCB                               1.0000 1.0000
25 CCV                               1.0000 1.0000
26 ST 13                             1.0000 1.0000
27 ST 13 DUP                         1.0000 1.0000
28 ST 15                             1.0000 1.0000
29 ST 15 DUP                         1.0000 1.0000
30 ST 17                             1.0000 1.0000
                                                                           PgDn
```

```
Cup 16 ID: ST 6 DUP                          Call entry. Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001   Time: 15:11:27  05 Nov 1999
Folder: NOVA99          Seq: 302                    Print: On
User:                   Batch:            Id: Ck2        Cup: 1 06 Gas:    0.23 LPM
State: Idle                                              Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A                                        PgUp
Cup Id          Extended id          Weight Volume Macro check Helo
31 ST 17 DUP                         1.00000 1.00000
32 ST 34                             1.00000 1.00000
33 ST 34 DUP                         1.00000 1.00000
34 ST 38                             1.00000 1.00000
35 ST 38 DUP                         1.00000 1.00000
36 ST 39                             1.00000 1.00000
37 ST 39 DUP                         1.00000 1.00000
38 ST 39 TRP                         1.00000 1.00000
39 ST 39 SPK                         1.00000 1.00000
40 DIB                               1.00000 1.00000
41 CCV                               1.00000 1.00000
42                                   1.00000 1.00000
43                                   1.00000 1.00000
44                                   1.00000 1.00000

                                                                               PgDn
```

```
Cup 31 ID: ST 17 DUP                          Cell entry, Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001    Time: 17:10:11  05 Nov 1999
Folder: NOVA99          Seq: 344                      Print: On
User:                   Batch:              Id: CCV        Cup: 1 41 Gas:    0.23 LPM
State: Idle                                                Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A
Cup Id          Extended id          Weight Volume Macro check Help
 1 ST 36                              1.0000 1.0000
 2 ST 36 DUP                          1.0000 1.0000
 3 ST 36 SPK                          1.0000 1.0000
 4 ST 25                              1.0000 1.0000
 5 ST 25 DUP                          1.0000 1.0000
 6 ST 27                              1.0000 1.0000
 7 ST 27 DUP                          1.0000 1.0000
 8 ST 29                              1.0000 1.0000
 9 ST 29 DUP                          1.0000 1.0000
10 ST 30                              1.0000 1.0000
11 ST 30 DUP                          1.0000 1.0000
12 ST 31                              1.0000 1.0000
13 ST 31 DUP                          1.0000 1.0000
14 ST 32                              1.0000 1.0000
15 ST 32 DUP                          1.0000 1.0000
                                                                          PgDn
```

```
Cup 1   ID: ST 36                                  Cell entry, Ins to switch
```

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 17:10:51  05 Nov 1999
Folder: NOVA99      Seq: 344                    Print: On
User:               Batch:            Id: CCV        Cup: 1 41 Gas:    0.23 LPM
State: Idle                                        Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 110599A                                    PgUp
cup Id        Extended id          Weight Volume Macro check Help
16 ST 42                           1.0000 1.0000
17 ST 42 DUP                       1.0000 1.0000
18 ST 43                           1.0000 1.0000
19 ST 43 DUP                       1.0000 1.0000
20 ST 33                           1.0000 1.0000
21 ST 33 DUP                       1.0000 1.0000
22 ST 33 TRP                       1.0000 1.0000
23 ST 33 SPK                       1.0000 1.0000
24 CCB                             1.0000 1.0000
25 CCV                             1.0000 1.0000
26 ST 37                           1.0000 1.0000
27 ST 37 SPK                       1.0000 1.0000
28 ST 35                           1.0000 1.0000
29 ST 35 DUP                       1.0000 1.0000
30 ST 19                           1.0000 1.0000
                                                                            PgDn

Cup 16 ID: ST 42                                   Cell entry, Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001    Time: 17:10:53  05 Nov 1999
Folder: NOVA99          Seq: 344                      Print: On
User:                   Batch:              Id: CCV        Cup: 1 41 Gas:    0.23 LPM
State: Idle                                                Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A                                          PgUp
cup Id          Extended id          Weight Volume Macro check Help
31 ST 19 DUP                         1.0000 1.0000
32 ST 20                             1.0000 1.0000
33 ST 20 DUP                         1.0000 1.0000
34 ST 21                             1.0000 1.0000
35 ST 21 DUP                         1.0000 1.0000
36 ST 22                             1.0000 1.0000
37 ST 22 DUP                         1.0000 1.0000
38 ST 23                             1.0000 1.0000
39 ST 23 DUP                         1.0000 1.0000
40 ST 23 TRP                         1.0000 1.0000
41 ST 23 SPK                         1.0000 1.0000
42 CCB                               1.0000 1.0000
43 CCV                               1.0000 1.0000
44                                   1.0000 1.0000

                                                                                 PgDn
```

```
Cup 31 ID: ST 19 DUP                          Call entry, Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001    Time: 18:58:04  05 Nov 1999
Folder: NOVA99          Seq: 388                      Print: On
User:                   Batch:              Id: CCV        Cup: 1 43 Gas:    0.23 LPM
State: Idle                                                Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry    Rack 110599A
cup Id          Extended id          Weight Volume Macro check Help
 1 ST 24                             1.0000 1.0000
 2 ST 24 DUP                         1.0000 1.0000
 3 ST 40                             1.0000 1.0000
 4 ST 40 DUP                         1.0000 1.0000
 5 ST 41                             1.0000 1.0000
 6 ST 41 DUP                         1.0000 1.0000
 7 BLANK                             1.0000 1.0000
 8 BLANK DUP                         1.0000 1.0000
 9 NIST ASH                          1.0000 1.0000
10 NIST ASH D                        1.0000 1.0000
11 ST 55                             1.0000 1.0000
12 ST 55 DUP                         1.0000 1.0000
13 ST 54                             1.0000 1.0000
14 ST 54 DUP                         1.0000 1.0000
15 ST 53                             1.0000 1.0000
                                                                                PgDn
```

```
Cup 1  ID: ST 24                                   Call entry, Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001    Time: 18:59:04  05 Nov 1999
Folder: NOVA99          Seq: 388                      Print: On
User:                   Batch:              Id: CCV        Cup: 1 43 Gas:    0.23 LPM
State: Idle                                                Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A                                          PgUp
Cup Id          Extended id          Weight Volume Macro check Help
16 ST 53 DUP                         1.0000 1.0000
17 ST 52                             1.0000 1.0000
18 ST 52 DUP                         1.0000 1.0000
19 ST 51  1/10                       1.0000 1.0000
20 ST 51 DUP 1/10                    1.0000 1.0000
21 ST 51 TRP 1/10                    1.0000 1.0000
22 ST 51 SPK 1/10                    1.0000 1.0000
23 CCB                               1.0000 1.0000
24 CCV                               1.0000 1.0000
25 ST 49                             1.0000 1.0000
26 ST 49 DUP                         1.0000 1.0000
27 ST 48  1/10                       1.0000 1.0000
28 ST 48 DUP 1/10                    1.0000 1.0000
29 ST 47                             1.0000 1.0000
30 ST 47 DUP                         1.0000 1.0000
                                                                                 PgDn
```

```
Cup 16 ID: ST 53 DUP                                  Cell entry, Ins to switch
```

```
Protocol: SYSTEST
                        Rev: 3.001    Time: 18:59:06  05 Nov 1999
Folder: NOVA99          Seq: 388                      Print: On
User:                   Batch:              Id: CCV        Cup: 1 43 Gas:    0.23 LPM
State: Idle                                                Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 110599A                                          PgUp
cup Id          Extended id          Weight Volume Macro check Help
31 ST 46 1/10                        1.0000 1.0000
32 ST 46 DUP 1/10                    1.0000 1.0000
33 ST 46 TRP 1/10                    1.0000 1.0000
34 ST 46 SPK 1/10                    1.0000 1.0000
35 CCB                               1.0000 1.0000
36 CCV                               1.0000 1.0000
37                                   1.0000 1.0000
38                                   1.0000 1.0000
39                                   1.0000 1.0000
40                                   1.0000 1.0000
41                                   1.0000 1.0000
42                                   1.0000 1.0000
43                                   1.0000 1.0000
44                                   1.0000 1.0000
                                                                                 PgDn
```

```
Cup 31 ID: ST 46                                   Call entry, Ins to switch
```

16:52:47 22 Nov 1999 Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 1 Rep: 1 Seq: 295 14:27:14 05 Nov 1999 HG

Hg .000 ug/L -444
Ave. Int. = -444 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 296 14:29:35 05 Nov 1999 HG

Hg .200 ug/L 9085
Ave. Int. = 9085 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 297 14:31:57 05 Nov 1999 HG

Hg .500 ug/L 23134
Ave. Int. = 23134 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 298 14:34:19 05 Nov 1999 HG

Hg 1.00 ug/L 45650
Ave. Int. = 45650 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 299 14:36:42 05 Nov 1999 HG

Hg 2.00 ug/L 95393
Ave. Int. = 95393 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 300 14:47:58 05 Nov 1999 HG

Hg 3.00 ug/L 139576
Ave. Int. = 139576 S. D. = 0

*** Check Standard: 2 Ck2 Seq: 301 15:03:26 05 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	.612	.604	ug/L	.000

CORRELATION COEFFICIENT 0.9998

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Ck2				Replicate Summary, Seq. 301 to 301				
Hg	.612	ug/L	.000	.612				

0.604 TV.

101 %

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: CCB					Seq: 326	16:17:57 05 Nov 1999 HG		
Hg	.010	ug/L	.000	.010		20.2 ug/L		
*** Sample ID: CCV					Seq: 327	16:20:15 05 Nov 1999 HG		
Hg	2.05	ug/L	.000	2.05		103%		
*** Sample ID: ST 13					Seq: 328	16:22:43 05 Nov 1999 HG		
Hg	.036	ug/L	.000	.036		<1.76 ug		
*** Sample ID: ST 13 DUP					Seq: 329	16:25:01 05 Nov 1999 HG		
Hg	.042	ug/L	.000	.042		<1.76 ug	RPD –	
*** Sample ID: ST 15					Seq: 330	16:27:19 05 Nov 1999 HG		
Hg	.043	ug/L	.000	.043		<1.49 ug		
*** Sample ID: ST 15 DUP					Seq: 331	16:29:37 05 Nov 1999 HG		
Hg	.043	ug/L	.000	.043		<1.49 ug	RPD –	
*** Sample ID: ST 17					Seq: 332	16:31:55 05 Nov 1999 HG		
Hg	.043	ug/L	.000	.043		<1.43 ug		
*** Sample ID: ST 17 DUP					Seq: 333	16:34:13 05 Nov 1999 HG		
Hg	.045	ug/L	.000	.045		<1.43 ug	RPD –	
*** Sample ID: ST 34					Seq: 334	16:36:31 05 Nov 1999 HG		
Hg	.011	ug/L	.000	.011		<2.0 ug/L ~~<0.10 ug~~ JAD 11/23		
*** Sample ID: ST 34 DUP					Seq: 335	16:38:50 05 Nov 1999 HG		
Hg	.010	ug/L	.000	.010		<2.0 ug/L ~~<0.10 ug~~ JAD 11/23	RPD –	
*** Sample ID: ST 38					Seq: 336	16:41:10 05 Nov 1999 HG		
Hg	.044	ug/L	.000	.044		<0.900 ~~ug/L~~ ug JAD 11/23		
*** Sample ID: ST 38 DUP					Seq: 337	16:43:30 05 Nov 1999 HG		
Hg	.042	ug/L	.000	.042		<0.900 ug	RPD –	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 39					Seq: 338	16:45:50 05 Nov 1999 HG		
Hg	.020	ug/L	.000	.020		<0.940 ug		
*** Sample ID: ST 39 DUP					Seq: 339	16:48:10 05 Nov 1999 HG		
Hg	.019	ug/L	.000	.019		<0.940 ug	RPD -	
*** Sample ID: ST 39 TRP					Seq: 340	16:50:30 05 Nov 1999 HG		
Hg	.020	ug/L	.000	.020		<0.940 ug	RPD	
*** Sample ID: ST 39 SPK					Seq: 341	16:52:51 05 Nov 1999 HG		
Hg	1.03	ug/L	.000	1.03		4.84 ug TV= 4.70 ug	103%	
*** Sample ID: CCB					Seq: 342	16:55:14 05 Nov 1999 HG		
Hg	.001	ug/L	.000	.001		<0.2ug/L		
*** Sample ID: CCV					Seq: 343	16:57:34 05 Nov 1999 HG		
Hg	2.04	ug/L	.000	2.04		102%		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 36					Seq: 344	17:14:12 05 Nov 1999 HG		
Hg	.009	ug/L	.000	.009		<2.0 ug/L		
*** Sample ID: ST 36 DUP					Seq: 345	17:16:29 05 Nov 1999 HG		
Hg	.010	ug/L	.000	.010		<2.0 ug/L	RPD -	
*** Sample ID: ST 36 SPK					Seq: 346	17:18:46 05 Nov 1999 HG		
Hg	1.03	ug/L	.000	1.03		10.3 ug/L TV = 10 ug/L	103%	
*** Sample ID: ST 25					Seq: 347	17:21:07 05 Nov 1999 HG		
Hg	.016	ug/L	.000	.016		<1.12 ug		
*** Sample ID: ST 25 DUP					Seq: 348	17:23:24 05 Nov 1999 HG		
Hg	.024	ug/L	.000	.024		<1.12 ug	RPD -	
*** Sample ID: ST 27					Seq: 349	17:25:41 05 Nov 1999 HG		
Hg	.049	ug/L	.000	.049		<1.04 ug		
*** Sample ID: ST 27 DUP					Seq: 350	17:27:58 05 Nov 1999 HG		
Hg	.054	ug/L	.000	.054		<1.04 ug	RPD -	
*** Sample ID: ST 29					Seq: 351	17:30:15 05 Nov 1999 HG		
Hg	.122	ug/L	.000	.122		<1.00 ug		
*** Sample ID: ST 29 DUP					Seq: 352	17:32:33 05 Nov 1999 HG		
Hg	.115	ug/L	.000	.115		<1.00 ug	RPD -	
*** Sample ID: ST 30					Seq: 353	17:34:50 05 Nov 1999 HG		
Hg	.029	ug/L	.000	.029		<1.01 ug		
*** Sample ID: ST 30 DUP					Seq: 354	17:37:08 05 Nov 1999 HG		
Hg	.031	ug/L	.000	.031		<1.01 ug	RPD -	
*** Sample ID: ST 31					Seq: 355	17:39:25 05 Nov 1999 HG		
Hg	.052	ug/L	.000	.052		<0.920 ug		

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: ST 31 DUP					Seq: 356	17:41:41 05 Nov 1999 HG			
Hg	.050	ug/L	.000	.050		<0.920 ug			RPD -
*** Sample ID: ST 32					Seq: 357	17:43:58 05 Nov 1999 HG			
Hg	.015	ug/L	.000	.015		<1.02 ug			
*** Sample ID: ST 32 DUP					Seq: 358	17:46:15 05 Nov 1999 HG			
Hg	.014	ug/L	.000	.014		<1.02 ug			RPD -
*** Sample ID: ST 42					Seq: 359	17:48:32 05 Nov 1999 HG			
Hg	.017	ug/L	.000	.017		<0.900 ug			
*** Sample ID: ST 42 DUP					Seq: 360	17:50:49 05 Nov 1999 HG			
Hg	.012	ug/L	.000	.012		<0.900 ug			RPD -
*** Sample ID: ST 43					Seq: 361	17:53:06 05 Nov 1999 HG			
Hg	.013	ug/L	.000	.013		<0.950 ug			
*** Sample ID: ST 43 DUP					Seq: 362	17:55:23 05 Nov 1999 HG			
Hg	.012	ug/L	.000	.012		<0.950 ug			RPD -
*** Sample ID: ST 33					Seq: 363	17:57:41 05 Nov 1999 HG			
Hg	.007	ug/L	.000	.007		<0.2 ug/L			
*** Sample ID: ST 33 DUP					Seq: 364	17:59:57 05 Nov 1999 HG			
Hg	.008	ug/L	.000	.008		<0.2 ug/L			RPD -
*** Sample ID: ST 33 TRP					Seq: 365	18:02:17 05 Nov 1999 HG			
Hg	.008	ug/L	.000	.008		<0.2 ug/L			RPD -
*** Sample ID: ST 33 SPK					Seq: 366	18:04:35 05 Nov 1999 HG			
Hg	.994	ug/L	.000	.994		0.994 ug/L TV = 1.00 ug/L			99%
*** Sample ID: CCB					Seq: 367	18:06:54 05 Nov 1999 HG			
Hg	.004	ug/L	.000	.004		<0.20 ug/L			

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: CCV					Seq: 368	18:09:12 05 Nov 1999 HG		
Hg	2.01	ug/L	.000	2.01		101 %		
*** Sample ID: ST 37					Seq: 369	18:11:43 05 Nov 1999 HG		
Hg	-.003	ug/L	.000	-.003		<0.20 ug/L		
*** Sample ID: ST 37 ~~SPK~~ DUP JAO 11/23					Seq: 370	18:14:01 05 Nov 1999 HG		
Hg	.009	ug/L	.000	.009		<0.20 ug/L RPD –		
*** Sample ID: ST 35					Seq: 371	18:16:19 05 Nov 1999 HG		
Hg	.018	ug/L	.000	.018		<4.0 ug/L		
*** Sample ID: ST 35 DUP					Seq: 372	18:18:37 05 Nov 1999 HG		
Hg	.017	ug/L	.000	.017		<4.0 ug/L RPD –		
*** Sample ID: ST 19					Seq: 373	18:20:55 05 Nov 1999 HG		
Hg	.016	ug/L	.000	.016		<0.600 ug		
*** Sample ID: ST 19 DUP					Seq: 374	18:23:13 05 Nov 1999 HG		
Hg	.016	ug/L	.000	.016		<0.600 ug RPD –		
*** Sample ID: ST 20					Seq: 375	18:25:31 05 Nov 1999 HG		
Hg	.017	ug/L	.000	.017		<0.720 ug		
*** Sample ID: ST 20 DUP					Seq: 376	18:27:50 05 Nov 1999 HG		
Hg	.017	ug/L	.000	.017		<0.720 ug RPD –		
*** Sample ID: ST 21					Seq: 377	18:30:11 05 Nov 1999 HG		
Hg	.024	ug/L	.000	.024		<0.640 ug		
*** Sample ID: ST 21 DUP					Seq: 378	18:32:31 05 Nov 1999 HG		
Hg	.020	ug/L	.000	.020		<0.640 ug RPD –		
*** Sample ID: ST 22					Seq: 379	18:34:51 05 Nov 1999 HG		
Hg	.024	ug/L	.000	.024		<0.620 ug		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 22 DUP					Seq: 380	18:37:11 05 Nov 1999 HG		
Hg	.023	ug/L	.000	.023		<0.620 ug RPD-		
*** Sample ID: ST 23					Seq: 381	18:39:31 05 Nov 1999 HG		
Hg	.018	ug/L	.000	.018		<0.580 ug		
*** Sample ID: ST 23 DUP					Seq: 382	18:41:51 05 Nov 1999 HG		
Hg	.017	ug/L	.000	.017		<0.580 ug RPD-		
*** Sample ID: ST 23 TRP					Seq: 383	18:44:11 05 Nov 1999 HG		
Hg	.018	ug/L	.000	.018		<0.580 ug RPD-		
*** Sample ID: ST 23 SPK					Seq: 384	18:46:31 05 Nov 1999 HG		
						REDEAT - SPIKED WRONG		
Hg	4.90	ug/L	.000	4.90				
*** Sample ID: ST 23 SPK					Seq: 385	18:50:20 05 Nov 1999 HG		
Hg	1.07	ug/L	.000	1.07		3.10 ug/L ug (SAMP w/23) 107% TV= 2.90 ug		
*** Sample ID: CCB					Seq: 386	18:52:45 05 Nov 1999 HG		
Hg	.004	ug/L	.000	.004		<0.2 ug/L		
*** Sample ID: CCV					Seq: 387	18:55:05 05 Nov 1999 HG		
Hg	2.01	ug/L	.000	2.01		101%		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 24					Seq: 388	19:02:31 05 Nov 1999 HG		
Hg	.025	ug/L	.000	.025				
*** Sample ID: ST 24 DUP					Seq: 389	19:04:48 05 Nov 1999 HG		
Hg	.020	ug/L	.000	.020				
*** Sample ID: ST 40					Seq: 390	19:07:05 05 Nov 1999 HG		
Hg	.022	ug/L	.000	.022				
*** Sample ID: ST 40 DUP					Seq: 391	19:09:22 05 Nov 1999 HG		
Hg	.019	ug/L	.000	.019				
*** Sample ID: ST 41					Seq: 392	19:11:39 05 Nov 1999 HG		
Hg	.016	ug/L	.000	.016				
*** Sample ID: ST 41 DUP					Seq: 393	19:13:56 05 Nov 1999 HG		
Hg	.016	ug/L	.000	.016				
*** Sample ID: BLANK					Seq: 394	19:16:13 05 Nov 1999 HG		
Hg	.114	ug/L	.000	.114				
*** Sample ID: BLANK DUP					Seq: 395	19:18:30 05 Nov 1999 HG		
Hg	.111	ug/L	.000	.111				
*** Sample ID: NIST ASH					Seq: 396	19:20:47 05 Nov 1999 HG		
Hg	1.60	ug/L	.000	1.60				
*** Sample ID: NIST ASH D					Seq: 397	19:23:11 05 Nov 1999 HG		
Hg	1.58	ug/L	.000	1.58				
*** Sample ID: ST 55					Seq: 398	19:25:30 05 Nov 1999 HG		
Hg	.279	ug/L	.000	.279				
*** Sample ID: ST 55 DUP					Seq: 399	19:27:47 05 Nov 1999 HG		
Hg	.289	ug/L	.000	.289				

NO DATA - HIGH SAMPLE

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 54					Seq: 400	19:30:03 05 Nov 1999 HG		
Hg	.354	ug/L	.000	.354				
*** Sample ID: ST 54 DUP					Seq: 401	19:32:19 05 Nov 1999 HG		
Hg	.354	ug/L	.000	.354				
*** Sample ID: ST 53					Seq: 402	19:34:36 05 Nov 1999 HG		
Hg	.576	ug/L	.000	.576				
*** Sample ID: ST 53 DUP					Seq: 403	19:36:53 05 Nov 1999 HG		
Hg	.570	ug/L	.000	.570				
*** Sample ID: ST 52					Seq: 404	19:39:10 05 Nov 1999 HG		
Hg	.086	ug/L	.000	.086				
*** Sample ID: ST 52 DUP					Seq: 405	19:41:27 05 Nov 1999 HG		
Hg	.085	ug/L	.000	.085				
*** Sample ID: ST 51					Seq: 406	19:43:45 05 Nov 1999 HG		
Hg	9.57	ug/L	.000	9.57				
*** Sample ID: ST 51 DUP					Seq: 407	19:46:24 05 Nov 1999 HG		
Hg	9.75	ug/L	.000	9.75				
*** Sample ID: ST 51 TRP					Seq: 408	19:48:57 05 Nov 1999 HG		
Hg	9.53	ug/L	.000	9.53				
*** Sample ID: ST 51 SPK					Seq: 409	19:51:31 05 Nov 1999 HG		
Hg	10.8	ug/L	.000	10.8				
*** Sample ID: CCB					Seq: 410	19:54:04 05 Nov 1999 HG		
Hg	-.019	ug/L	.000	-.019				
*** Sample ID: CCV					Seq: 411	19:56:22 05 Nov 1999 HG		
Hg	2.28	ug/L	.000	2.28				

NO DATA - HIGH SAMPLE

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: CCB					Seq: 412	19:59:29 05 Nov 1999 HG		
Hg	.005	ug/L	.000	.005				
*** Sample ID: CCV					Seq: 413	20:01:47 05 Nov 1999 HG		
Hg	2.25	ug/L	.000	2.25				

NO DATA - HIGH SAMPLE

*** Standard: 1 Rep: 1 Seq: 414 20:04:21 05 Nov 1999 HG

Hg .000 ug/L -501
Ave. Int. = -501 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 415 20:06:43 05 Nov 1999 HG

Hg .100 ug/L 9503
Ave. Int. = 9503 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 416 20:09:05 05 Nov 1999 HG

Hg .500 ug/L 23835
Ave. Int. = 23835 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 417 20:11:28 05 Nov 1999 HG

Hg 1.00 ug/L 46617
Ave. Int. = 46617 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 418 20:13:54 05 Nov 1999 HG

Hg 2.00 ug/L 95858
Ave. Int. = 95858 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 419 20:18:57 05 Nov 1999 HG

Hg 3.00 ug/L 138420
Ave. Int. = 138420 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 20:19:41 05 Nov 1999

Folder: NOVA99 Seq: 420 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 24 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

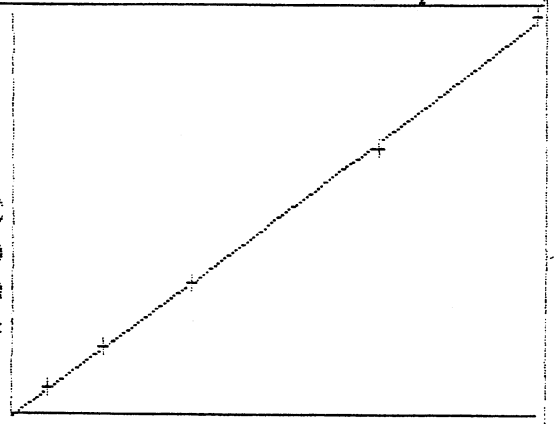
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	-.016	-.016	Quadratic	
S2	.200	.199	-.001	WtdLinear	
S3	.500	.506	.006		C
S4	1.00	.995	-.005	Accept	o
S5	2.00	2.05	.052		n
S6	3.00	2.96	-.035	StdAdd	c

A .0000000 r .999690

B 2.14589e-5 C -5.38917e-3



Relative Absorbance

	Mean	%RSD	
S1	-501	0	-501
S2	9503	0	9503
S3	23835	0	23835
S4	46617	0	46617
S5	95858	0	95858
S6	138420	0	138420

33?

New calibration coefficients stored

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 CK2 Seq: 420 20:22:09 05 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD	
Hg		99.9	.603	.604	ug/L	.000	100 %

*** Sample ID: ST 24 Seq: 421 20:24:28 05 Nov 1999 HG

Hg .007 ug/L .000 .007 <0.560 ug

*** Sample ID: ST 24 DUP Seq: 422 20:26:45 05 Nov 1999 HG

Hg .006 ug/L .000 .006 <0.560 ug RPD -

*** Sample ID: ST 40 Seq: 423 20:29:02 05 Nov 1999 HG

Hg .001 ug/L .000 .002 <0.560 ug

*** Sample ID: ST 40 DUP Seq: 424 20:31:19 05 Nov 1999 HG

Hg -.001 ug/L .000 -.001 <0.560 ug RPD -

*** Sample ID: ST 41 Seq: 425 20:33:36 05 Nov 1999 HG

Hg .001 ug/L .000 .001 <0.600 ug

*** Sample ID: ST 41 DUP Seq: 426 20:35:53 05 Nov 1999 HG

Hg -.000 ug/L .000 -.000 <0.600 ug RPD -

*** Sample ID: BLANK - DIGESTED Seq: 427 20:38:10 05 Nov 1999 HG

Hg .102 ug/L .000 .102 <0.20 ug/L

*** Sample ID: BLANK DUP Seq: 428 20:40:28 05 Nov 1999 HG

Hg .099 ug/L .000 .099 <0.20 ug/L RPD -

*** Sample ID: NIST ASH Seq: 429 20:42:45 05 Nov 1999 HG

Hg 1.59 ug/L .000 1.59 0.158 ug/g OK

LIMITS 0.122 - 0.160 ug/g

*** Sample ID: NIST ASH D Seq: 430 20:45:09 05 Nov 1999 HG

Hg 1.60 ug/L .000 1.60 0.159 ug/g RPD 1%

*** Sample ID: ST 55 Seq: 431 20:47:33 05 Nov 1999 HG

Hg .262 ug/L .000 .262 0.013 ug

20:49:50 05 Nov 1999 Folder: NOVA99 Protocol: SYSTEST Page 78

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 55 DUP					Seq: 432	20:49:50 05 Nov 1999 HG		
Hg	.278	ug/L	.000	.278	0.014 ug RPD - 7%			
*** Sample ID: ST 54					Seq: 433	20:52:06 05 Nov 1999 HG		
Hg	.345	ug/L	.000	.345	0.017 ug			
*** Sample ID: ST 54 DUP					Seq: 434	20:54:22 05 Nov 1999 HG		
Hg	.343	ug/L	.000	.343	0.017 ug RPD — 0%			
*** Sample ID: ST 53					Seq: 435	20:56:39 05 Nov 1999 HG		
Hg	.562	ug/L	.000	.562	0.028 ug			
*** Sample ID: ST 53 DUP					Seq: 436	20:58:56 05 Nov 1999 HG		
Hg	.553	ug/L	.000	.553	0.028 ug RPD - 0%			
*** Sample ID: ST 52					Seq: 437	21:01:13 05 Nov 1999 HG		
Hg	.070	ug/L	.000	.070	<0.010 ug			
*** Sample ID: ST 52 DUP					Seq: 438	21:03:30 05 Nov 1999 HG		
Hg	.076	ug/L	.000	.076	<0.010 ug RPD -			
*** Sample ID: ST 51			1/10		Seq: 439	21:05:48 05 Nov 1999 HG		
Hg	1.06	ug/L	.000	1.06	JAO 1/17 ~~37.7~~ 21.3 ug			
*** Sample ID: ST 51 DUP			1/10		Seq: 440	21:08:07 05 Nov 1999 HG		
Hg	1.01	ug/L	.000	1.01	JAO 1/17 ~~35.9~~ 20.3 ug RPD - 5%			
*** Sample ID: ST 51 TRP			1/10		Seq: 441	21:10:27 05 Nov 1999 HG		
Hg	1.04	ug/L	.000	1.04	JAO 1/17 ~~37.0~~ 20.9 ug RPD - 2%			
*** Sample ID: ST 51 SPK			1/10		Seq: 442	21:12:45 05 Nov 1999 HG		
Hg	1.12	ug/L	.000	1.12	JAO 1/17 ~~39.8~~ 22.5 60% ~~+112%~~ JAO 1/23 SPIKE DILUT OUT (1/10)			
*** Sample ID: CCB					Seq: 443	21:15:04 05 Nov 1999 HG		
Hg	-.014	ug/L	.000	-.014				

20.20 ug/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: CCV					Seq: 444	21:17:22 05 Nov 1999 HG		
Hg	2.26	ug/L	.000	2.26	113%			
*** Sample ID: ST 49					Seq: 445	21:19:51 05 Nov 1999 HG		
Hg	.076	ug/L	.000	.076	~~<0.010 ug~~ REPEAT			
*** Sample ID: CCB					Seq: 446	21:23:22 05 Nov 1999 HG		
Hg	-.009	ug/L	.000	-.009	<0.20 ug/L			
*** Sample ID: CCV					Seq: 447	21:25:40 05 Nov 1999 HG		
Hg	2.00	ug/L	.000	2.00	100%			
*** Sample ID: ST 49					Seq: 448	21:28:11 05 Nov 1999 HG		
Hg	.075	ug/L	.000	.075	<0.010 ug			
*** Sample ID: ST 49 DUP					Seq: 449	21:30:30 05 Nov 1999 HG		
Hg	.077	ug/L	.000	.077	<0.010 ug RPD —			
*** Sample ID: ST 48					Seq: 450	21:32:48 05 Nov 1999 HG		
Hg	10.2	ug/L	.000	10.2	NO DATA			
*** Sample ID: ST 48 1/10					Seq: 451	21:35:29 05 Nov 1999 HG		
Hg	1.10	ug/L	.000	1.10	23.3 ug			
*** Sample ID: ST 48 DUP 1/10					Seq: 452	21:37:48 05 Nov 1999 HG		
Hg	1.05	ug/L	.000	1.05	22.2 ug RPD - 5%			
*** Sample ID: ST 47					Seq: 453	21:40:06 05 Nov 1999 HG		
Hg	.133	ug/L	.000	.133	<0.010 ug			
*** Sample ID: ST 47 DUP					Seq: 454	21:42:24 05 Nov 1999 HG		
Hg	.138	ug/L	.000	.138	<0.010 ug RPD —			
*** Sample ID: ST 46 1/10					Seq: 455	21:44:42 05 Nov 1999 HG		
Hg	.599	ug/L	.000	.599	17.1 ug			

Folder: NOVA99 Page 50
21:47:00 05 Nov 1999 Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ST 46 DUP 1/10					Seq: 456	21:47:00 05 Nov 1999 HG		
Hg	.603	ug/L	.000	.603	17.2 ug	RPD - 1%		
*** Sample ID: ST 46 TRP 1/10					Seq: 457	21:49:19 05 Nov 1999 HG		
Hg	.614	ug/L	.000	.614	17.5 ug	RPD 2%		
*** Sample ID: ST 46 SPK 1/10					Seq: 458	21:51:40 05 Nov 1999 HG		
Hg	1.08	ug/L	.000	1.08	30.8 ug	481% ~~1386 137%~~	SPIKE	
*** Sample ID: CCB					Seq: 459	21:54:01 05 Nov 1999 HG		
Hg	-.009	ug/L	.000	-.009	<0.20 ug/L			
*** Sample ID: CCV					Seq: 460	21:56:21 05 Nov 1999 HG		
Hg	2.01	ug/L	.000	2.01	101 %			

TV. ~~10 ug~~ 2.05

11/15/99 Analytical Run

Protocol: SYSTEST

Rev: 3.001 Time: 14:21:07 15 Nov 1999

Folder: NOV99B Seq: 102 Print: On

User: Batch: Id: StoReol Cup: 1 18 Gas: 0.33 LPM

State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 111599a

cup	Id	Extended id	weight	Volume	Macro	check	Help
1	ice		1.0000	1.0000			
2	filolk		1.0000	1.0000			
3	filolkcup		1.0000	1.0000			
4	1630b		1.0000	1.0000			
5	1630bcup		1.0000	1.0000			
6	47036		1.0000	1.0000			
7	47036DUP		1.0000	1.0000			
8	47032		1.0000	1.0000			
9	47032DUP		1.0000	1.0000			
10	47048		1.0000	1.0000			
11	47048DUP		1.0000	1.0000			
12	023.024	1:5 ~~1:5~~ 1:10	1.0000	1.0000			
13	023024DUP	1:5 ~~1:5~~ 1:10	1.0000	1.0000			
14	47042		1.0000	1.0000			
15	47042DUP		1.0000	1.0000			

PgDn

Cup: 1 ID: ice Call entry, Ins to switch

Protocol: SYSTEST

Rev: 3.001 Time: 14:21:14 15 Nov 1999

Folder: NOV99B Seq: 102 Print: On

User: Batch: Id: Sto6Recl Cup: 1 15 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 111599a Pgup

Cup	Id	Extended Id		Weight	Volume	Macro	Check	Help
16	025,026	~~1:5~~	1:10	1.0000	1.0000			
17	025,026DUP	~~1:5~~	1:10	1.0000	1.0000			
18	47045			1.0000	1.0000			
19	47045DUP	11/15 Stag		1.0000	1.0000			
20	47045TRP	20ml ~~1:5~~	1:10	1.0000	1.0000			
21	027,028			1.0000	1.0000			
22	027,028DUP	~~1:5~~	1:10	1.0000	1.0000			
23	027,028SPK	~~1:5~~	1:10	1.0000	1.0000			
24	CCB			1.0000	1.0000			
25	CCV			1.0000	1.0000			
26	47047			1.0000	1.0000			
27	47047DUP			1.0000	1.0000			
28	47040			1.0000	1.0000			
29	47040DUP			1.0000	1.0000			
30	CCB			1.0000	1.0000			

Pgdn

Cup 16 ID: 025,026 Dell entry. Ins to switch

```
Protocol: SYSTEST
                    Rev: 1.001   Time: 14:21:19  15 Nov 1999
Folder: NOV99B      Seq: 102                     Print: On
User:               Batch:            Id: Std6Rep1   Cup: 1 18 Gas:    0.23 LPM
State: Idle                                          Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 111599a                                    Pg15
Cup Id        Extended Id          Weight Volume Macro check Help
31 CCV                             1.0000 1.0000
32                                 1.0000 1.0000
33                                 1.0000 1.0000
34                                 1.0000 1.0000
35                                 1.0000 1.0000
36                                 1.0000 1.0000
37                                 1.0000 1.0000
38                                 1.0000 1.0000
39                                 1.0000 1.0000
40                                 1.0000 1.0000
41                                 1.0000 1.0000
42                                 1.0000 1.0000
43                                 1.0000 1.0000
44                                 1.0000 1.0000

                                                                          PgDn

Cup 31 ID: CCV                                   Cell entry, Ins to switch
```

*** Standard: 1 Rep: 1 Seq: 96 13:53:10 15 Nov 1999 HG

Hg .000 ug/L -367
Ave. Int. = -367 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 97 13:55:31 15 Nov 1999 HG

Hg .200 ug/L 8703
Ave. Int. = 8703 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 98 13:57:53 15 Nov 1999 HG

Hg .500 ug/L 21512
Ave. Int. = 21512 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 99 14:00:15 15 Nov 1999 HG

Hg 1.00 ug/L 44241
Ave. Int. = 44241 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 100 14:02:39 15 Nov 1999 HG

Hg 2.00 ug/L 87339
Ave. Int. = 87339 S. D. = 0

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 6 Rep: 1 Seq: 101 14:10:28 15 Nov 1999 HG

Hg 3.00 ug/L 133413
Ave. Int. = 133413 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 14:12:16 15 Nov 1999

Folder: NOV99B Seq: 102 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 18 Gas: 8.23 LPM

State: Idle Xmit: Off Autosampler: On

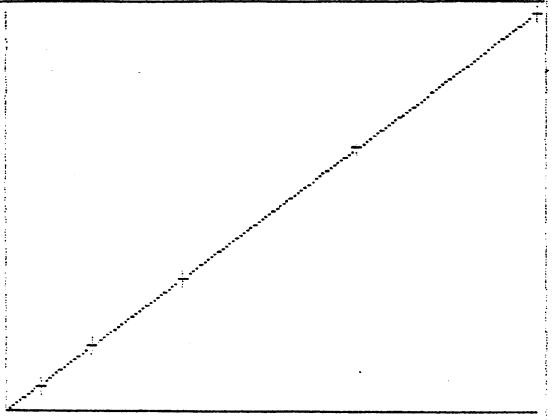
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	.002	.002	Quadratic	
S2	.200	.206	.006	WtdLinear	
S3	.500	.495	-.005		C
S4	1.00	1.01	.006	Accept	o
S5	2.00	1.98	-.023		n
S6	3.00	3.01	.014	StdAdd	c

A .0000000 r .999937

B 2.25104e-5 C 1.05838e-2



Relative Absorbance

	Mean	%RSD	
S1	-367	0	-367
S2	8703	0	8703
S3	21512	0	21512
S4	44241	0	44241
S5	87339	0	87339
S6	133413	0	133413

337

New calibration coefficients stored

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2 Seq: 102 14:37:47 15 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	.607	.604	ug/L	.000

100%

*** Sample ID: icb Seq: 103 14:40:15 15 Nov 1999 HG

Hg .004 ug/L .000 .004 <0.2 ug/L

*** Sample ID: filblk Seq: 104 14:42:32 15 Nov 1999 HG

Hg .061 ug/L .000 .061 <0.2 ug/L

*** Sample ID: filblkdup Seq: 105 14:44:49 15 Nov 1999 HG

Hg .061 ug/L .000 .061 <0.2 ug/L RPD —

*** Sample ID: 16300 Seq: 106 14:47:06 15 Nov 1999 HG

Hg 1.60 ug/L .000 1.60 0.149 ug/g

RANGE 0.122 - 0.160 ug/g

*** Sample ID: 16300dup Seq: 107 14:49:24 15 Nov 1999 HG

Hg 1.60 ug/L .000 1.60 0.149 ug/g RPD 0%

*** Sample ID: 47034 Seq: 108 14:51:42 15 Nov 1999 HG

Hg .601 ug/L .000 .601

*** Sample ID: 47034DUP Seq: 109 14:54:00 15 Nov 1999 HG

Hg .601 ug/L .000 .601

*** Sample ID: 47032 Seq: 110 14:56:17 15 Nov 1999 HG

Hg .139 ug/L .000 .139 <0.01 ug

*** Sample ID: 47032DUP Seq: 111 14:58:34 15 Nov 1999 HG

Hg .140 ug/L .000 .140 <0.01 ug RPD —

*** Sample ID: 47045 Seq: 112 15:00:52 15 Nov 1999 HG

Hg .097 ug/L .000 .097

*** Sample ID: 47045DUP Seq: 113 15:03:11 15 Nov 1999 HG

Hg .094 ug/L .000 .094

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 023,024					Seq: 114	15:05:28 15 Nov 1999 HG		
Hg	4.45	ug/L	.000	4.45		NO DATA, >RL		
*** Sample ID: 023024DUP					Seq: 115	15:07:55 15 Nov 1999 HG		
Hg	4.49	ug/L	.000	4.49		NO DATA, >RL		
*** Sample ID: 47042					Seq: 116	15:10:22 15 Nov 1999 HG		
Hg	.443	ug/L	.000	.443				
*** Sample ID: 47042DUP					Seq: 117	15:12:40 15 Nov 1999 HG		
Hg	.454	ug/L	.000	.454				
*** Sample ID: 025,026					Seq: 118	15:14:57 15 Nov 1999 HG		
Hg	3.52	ug/L	.000	3.52				
*** Sample ID: 025,026DUP					Seq: 119	15:17:24 15 Nov 1999 HG		
Hg	3.56	ug/L	.000	3.56				
*** Sample ID: 47043					Seq: 120	15:19:46 15 Nov 1999 HG		
Hg	1.30	ug/L	.000	1.30				
*** Sample ID: 47043DUP					Seq: 121	15:22:05 15 Nov 1999 HG		
Hg	1.30	ug/L	.000	1.30				
*** Sample ID: 47043TRF					Seq: 122	15:24:24 15 Nov 1999 HG		
Hg	1.31	ug/L	.000	1.31				
*** Sample ID: 027,028					Seq: 123	15:26:43 15 Nov 1999 HG		
Hg	6.66	ug/L	.000	6.66				
*** Sample ID: 027,028DUP					Seq: 124	15:29:14 15 Nov 1999 HG		
Hg	6.62	ug/L	.000	6.62				
*** Sample ID: 027,028SPK					Seq: 125	15:31:43 15 Nov 1999 HG		
Hg	7.54	ug/L	.000	7.54				

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: CCB					Seq: 126	15:34:16 15 Nov 1999 HG		
Hg	.001	ug/L	.000	.001		<0.20 ug/L		
*** Sample ID: CCV					Seq: 127	15:36:34 15 Nov 1999 HG		
Hg	1.94	ug/L	.000	1.94		97%		
*** Sample ID: 47047					Seq: 128	15:38:59 15 Nov 1999 HG		
Hg	1.05	ug/L	.000	1.05				
*** Sample ID: 47047DUP					Seq: 129	15:41:17 15 Nov 1999 HG		
Hg	1.03	ug/L	.000	1.03				
*** Sample ID: 47040					Seq: 130	15:43:36 15 Nov 1999 HG		
Hg	1.05	ug/L	.000	1.05				
*** Sample ID: 47040DUP					Seq: 131	15:45:56 15 Nov 1999 HG		
Hg	1.04	ug/L	.000	1.04				
*** Sample ID: 023,024	1:10				Seq: 132	15:49:37 15 Nov 1999 HG		
Hg	.463	ug/L	.000	.463				
*** Sample ID: 023024DUP	1:10				Seq: 133	15:51:53 15 Nov 1999 HG		
Hg	.462	ug/L	.000	.462				
*** Sample ID: 025,026					Seq: 134	15:59:02 15 Nov 1999 HG		
Hg	.370	ug/L	.000	.370				
*** Sample ID: 025,026DUP					Seq: 135	16:01:19 15 Nov 1999 HG		
Hg	.365	ug/L	.000	.365				
*** Sample ID: 027,028					Seq: 136	16:03:36 15 Nov 1999 HG		
Hg	.709	ug/L	.000	.709				
*** Sample ID: 027,028DUP					Seq: 137	16:05:54 15 Nov 1999 HG		
Hg	.695	ug/L	.000	.695				

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 027,0288PK					Seq: 138	16:08:12 15 Nov 1999 HG		
Hg	.810	ug/L	.000	.810				
*** Sample ID: CCB					Seq: 139	16:10:31 15 Nov 1999 HG		
Hg	.007	ug/L	.000	.007	<0.20 ug/L			
*** Sample ID: CCV					Seq: 140	16:12:49 15 Nov 1999 HG		
Hg	1.95	ug/L	.000	1.95	98%			

Dry Weight Results

Dry Weight/Total Volatile Solids (TVS) Notebook # 5

Sample Number	SAMMIS →			~~BMP~~ →		
Client/Pan #	#1 RUN #1	#2 RUN#2	#3 RUN#3	#4 RUN#1	#5 RUN#2	#6 RUN#3
Wt of Pan + Sample	26.1368 ~~25.4740~~ 10/18	24.4101	25.4543	25.5202	28.2050	26.9918
Wt after Drying	24.8686	23.3208	24.2961	24.2684	26.6654	25.7205
Wt of Pan or Wt After Ignition	2.6212	2.6074	2.6124	2.6235	2.6033	2.6197
Difference	22.2474	20.7134	21.6837	21.6449	24.0621	23.1008
Sample amount g	23.5156	21.8077	22.8419	22.8967	25.6017	24.3721
Result	94.6%	95.0%	94.9%	~~94.5%~~	94.0%	~~94.8%~~

Sample Number						
Client/Pan #						
Wt of Pan + Sample						
Wt after Drying						
Wt of Pan or Wt After Ignition						
Difference						
Sample amount g						
Result						

Sample Number					Batch Number:
Client/Pan #					3395
Wt of Pan + Sample					Note:
Wt after Drying					Samples not logged in
Wt of Pan or Wt After Ignition					
Difference					
Sample amount g					
Result					

Analyst: JDB Date: 10/18/99

TestAmerica

METCO Particulate Analysis Records

METCO Environmental

Particulate Analysis EPA Method 17

Thimbles and Backup Filters

Job Number 99-95 WHS1 Location Stratton, Ohio

Job Name EPRI Unit Tested Unit 1 Baghouse Inlet

Desiccator Time In	1/7				
Desiccator Time Out	1550 1/11	1145 10/12			

Run No. 1	Thimble No. Q1		Filter No. 47Q 25		
Thimble Final Weight (g)	32.8970	32.8920	✓ <1%		
Thimble Initial Weight (g)	3.3035	3.3035			
Particulate (g)	29.5935	29.5885	✓		
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1042	0.1042	✓		

Filter and Particulate Average (g) 0.1042 ✓
Initial Filter Weight (g) 0.1080 ✓
Filter Particulate Average (mg) 0 ✓
Thimble Particulate Average (mg) 29,591.0 ✓
Total Particulate (mg) 29,591.0

Run No. 2	Thimble No. Q2		Filter No. 47Q 28 torn edge		
Thimble Final Weight (g)	24.4229	24.4227	✓		
Thimble Initial Weight (g)	3.0904	3.0904			
Particulate (g)	21.3325	21.3323	✓		
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1030	0.1030	✓		

Filter and Particulate Average (g) 0.1030 ✓
Initial Filter Weight (g) 0.1051 ✓
Filter Particulate Average (mg) 0 ✓
Thimble Particulate Average (mg) 21,332.4 ✓
Total Particulate (mg) 21,332.4 ✓

Run No. _____	Thimble No. _____		Filter No. _____		
Thimble Final Weight (g)					
Thimble Initial Weight (g)					
Particulate (g)					
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)					

Filter and Particulate Average (g) _____
Initial Filter Weight (g) _____
Filter Particulate Average (mg) _____
Thimble Particulate Average (mg) _____
Total Particulate (mg) _____

MH

Analyst

METCO Environmental

Particulate Analysis EPA Method 17

Thimbles and Backup Filters

Job Number 99-95 11HS1 Location Stratton, Ohio

Job Name EPRI Unit Tested Unit 1 Baghouse Inlet

Desiccator Time In	10/7				
Desiccator Time Out	1555 10/11	1148 10/12			

Run No. 3 1d2	Thimble No. Q8		Filter No. 47030		
Thimble Final Weight (g)	19.7399	19.7393	✓		
Thimble Initial Weight (g)	2.9555	2.9555			
Particulate (g)	16.7844	16.7838	✓		
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.0992	0.0992			

Filter and Particulate Average (g) 0.0992 ✓

Initial Filter Weight (g) 0.1051 ✓

Filter Particulate Average (mg) 0 ✓

Thimble Particulate Average (mg) 16,784.1 ✓

Total Particulate (mg) [ ]

Run No. 3 2d2	Thimble No. Q12		Filter No. —		
Thimble Final Weight (g)	8.1275	8.1266	✓ <1%		
Thimble Initial Weight (g)	3.0140	3.0140			
Particulate (g)	5.1135	5.1126			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)					

Filter and Particulate Average (g) _____

Initial Filter Weight (g) _____

Filter Particulate Average (mg) _____

Thimble Particulate Average (mg) 5,113.1 ✓

Total Particulate (mg) [21,897.2]

Run No. _____	Thimble No. _____		Filter No. _____		
Thimble Final Weight (g)					
Thimble Initial Weight (g)					
Particulate (g)					
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)					

Filter and Particulate Average (g) _____

Initial Filter Weight (g) _____

Filter Particulate Average (mg) _____

Thimble Particulate Average (mg) _____

Total Particulate (mg) [ ]

JPB

Analyst

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA/NVLAP 101262-0
• AIHA ACCREDITATION NO. 100439
• NY DOH 10903
• PA DER 06-353
• NJ DEP 77678

ANALYTICAL REPORT

Client: METCO Environmental

Report to: Doug Saathoff
METCO Environmental
P. O. Box 598
Addison TX 75001

Project: 188435
Received: 24-NOV-99
Reported: 16-DEC-99

PURCHASE ORDER: 99-95-WHS1

Project Description: Unit 1-OH Ed/Sammis

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 1 Coal Comp. (SAMMIS)						
Lab Sample: 1384806						
sampled: 23-SEP-99 17:00						
Moisture, Total	5.34		%	D 3302	01-DEC-99	GLB
SHORT PROX - COAL						
Ash	16.4	17.3	%	D 3174	08-DEC-99	VJO
Sulfur	0.86	0.91	%	D 4239	08-DEC-99	VJO
Heating Value	11550	12200	BTU/lb	D 3286	08-DEC-99	VJO
Chloride, Total	0.12	0.13	%	E776/300.0	14-DEC-99	DRK
Run 2 Coal Comp. (SAMMIS)						
Lab Sample: 1384807						
sampled: 24-SEP-99 09:00						
Moisture, Total	4.74		%	D 3302	01-DEC-99	GLB
SHORT PROX - COAL						
Ash	8.86	9.30	%	D 3174	08-DEC-99	VJO
Sulfur	1.44	1.51	%	D 4239	08-DEC-99	VJO
Heating Value	12950	13590	BTU/lb	D 3286	07-DEC-99	VJO
Chloride, Total	0.11	0.12	%	E776/300.0	14-DEC-99	DRK
Run 3 Coal Comp. (SAMMIS)						
Lab Sample: 1384808						
sampled: 24-SEP-99 11:00						
Moisture, Total	4.74		%	D 3302	01-DEC-99	GLB
SHORT PROX - COAL						
Ash	9.37	9.84	%	D 3174	08-DEC-99	VJO
Sulfur	1.36	1.43	%	D 4239	08-DEC-99	VJO
Heating Value	12890	13540	BTU/lb	D 3286	07-DEC-99	VJO

PHILIP
ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA/NVLAP 101262-0
• AIHA ACCREDITATION NO. 100439
• NY DOH 10903
• PA DER 06-353
• NJ DEP 77678

Client: METCO Environmental
Project: 188435

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 3 Coal Comp. (SAMMIS)						
Lab Sample: 1384808 - continued						
Chloride, Total	0.11	0.12	%	E776/300.0	14-DEC-99	DRK

< Indicates less than the limit of quantitation.

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-8833 FAX 610-921-9667

Philip Analytical Services
Quality Assurance Protocol

PAS Sample#: All Projects Listed

Client Name: Metco

PAS Project#:188433,188435,188427,188429,188431

Job ID :

Units: %, BTU/lb

O1 SUMMARY FORM

Sample # & Parameter	Matrix Spike				Matrix Spike Duplicate				Laboratory Control Sample		
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Recovery	Matrix Spike Dup Conc.	Recovery	Precision RPD	Method Blank	Spikes Conc.	Found Conc.	Recovery

Sample # & Parameter	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD	Spikes Conc.	Found Conc.	Recovery		
1384796-Ash					12.2	12.0	1.7	11.8	11.9	101	N/A	0.01
1384797-Sulfur					4.52	4.58	1.32	1.78	1.77	99	N/A	0.01
1384797-Heating Value					13710	13686	0.17	13350	13410	100	N/A	50
1384797-Chlorine					0.07	0.08	13	2.00	1.87	94	0.01	0.01

Matrix Spike	75 - 125
Laboratory Control Sample	80 - 120
Duplicate	0 - 20

PHILIP
ANALYTICAL SERVICES

Chain of Custody Record

4418 Pottsville Pike Reading, PA 19605
phone: (610) 921-8833 fax: (610) 921-9667

Sample Container Information

Bottle Type (G P H)												
# of Containers												
Preserved? (Y/N)												

188435

Report Results To:
PO# 99-95-WHS Job ID UNIT 1-OHED./SAMMIS
Name DOUG SAOTHOFF
Company METCO ENVIRONMENTAL
Mailing Address P.O. BOX 598
City ADDISON State TX ZIP 75025
Telephone # 972/931/7127 Fax # 972/931/3398

Send Invoice To:
Name SAME Telephone #
Company Dept.
Mailing Address
City State Zip
Credit Card # Exp. Date

Analysis Requested

Page 1 of 1
PAS Quote#

Sampled by:

	SAMPLE DESCRIPTION	Air Vol. (L or min)	Matrix Type	Date Sampled	Time Sampled	BTU CONTENT	FLY ASH	SULFUR	CHLORIDE										
JAR 1-3	1. RUN 1 COAL COMP.			9/23/99	1700	X	X	X	X										
JAR 1-4	2 RUN 2 COAL COMP.			9/24/99	0900	X	X	X	X										
JAR 1-4	3 RUN 3 COAL COMP.			9/24/99	1100	X	X	X	X										
11 TOTAL	4																		
	5 *SEE ATTACHED																		
	6 INSTRUCTIONS																		
	7 →																		
	8																		
	9																		
	10																		

Comments/Hazards/Location Details

ATTN: CHRIS WEATHINGTON
TEST AMERICA, INC.
3601 S. DIXIE DRIVE
DAYTON, OH 45439
PH: 1-800-572-9839
* AFTER SAMPLE HAS BEEN PREPPED. PLEASE RETURN A 4 OZ. JAR SAMPLE TO TEST AMERICA AT THE ABOVE ADDRESS. THANK YOU!

Special Instructions (including Data Deliverables and Turn Around Time):

Samples relinquished to shipper or courier by:	Date 11/19/99	Time 1530	
Samples received by:	Date	Time	

Samples Relinquished by:	Samples Relinquished to:	Date	Time
Samples Relinquished by:	Samples Relinquished to Laboratory:	Date 11/24	Time 1100

Method of Shipment/Delivery: UPS FED-EX PAS Courier Client drop off Other

Samples Rec'd. on ice? (Y N n/a) Temp. Blank Sample Temp.
Samples rec'd intact? (Y N) Custody seals intact? (Y N n/a) ID on samples match COC? (Y N)
VOC Samples have zero headspace? (Y N n/a) Samples properly preserved? (Y N n/a)

Notes:

Jars labelled "SAMMIS" 11-24-99

TOTAL P.06

^ 12/13/99 + page 1

Metco

188435

1384806

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	3.38	3.38 >5.34	****
MOISTURE:	%	2.03	1.96	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	78.23	82.65
ASH:	%	17.00	16.43	17.35
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	11951	11550	12200
SULFUR:	%	0.89	0.86	0.91
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.22	-0.23
HYDROGEN INCL WATER:	%	0.00	0.38	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	77.59	81.97
OXYGEN INCL WATER:	%	82.11	82.34	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

^ 12/13/99 + page 1

Metro

188435

#138480

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	3.49	3.49	****
MOISTURE:	%	1.30	1.25 4.74	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	86.40	90.70
ASH:	%	9.18	8.86	9.30
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	13417	12950	13590
SULFUR:	%	1.49	1.44	1.51
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.14	-0.15
HYDROGEN INCL WATER:	%	0.00	0.39	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	85.10	89.34
OXYGEN INCL WATER:	%	89.33	89.31	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

^ 12/13/99 + page 1

Metro
PN 188435
1384808

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	3.59	3.59 > 4.74	****
MOISTURE:	%	1.19	1.15	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	85.89	90.16
ASH:	%	9.72	9.37	9.84
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	13375	12890	13540
SULFUR:	%	1.41	1.36	1.43
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.13	-0.13
HYDROGEN INCL WATER:	%	0.00	0.40	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	84.66	88.87
OXYGEN INCL WATER:	%	88.87	88.87	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mv readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
12/9/99	1384807 188435	50/0.5444	RHD										
					12.081 mg/l × 50/0.5444 × .0001 = 0.11% Chlorine								
	1384808	50/0.5234											
					11.564 mg/l × 50/0.5234 × .0001 = 0.11% Chlorine								
	1384812 188437	50/0.4925											
					< 1.000 mg/l × 50/0.4925 × .0001 = < 0.01% Chlorine								
	1384813	50/0.4708											
					< 1.000 mg/l × 50/0.4708 × .0001 = < 0.01% Chlorine								
	1384814	50/0.5594											
					1.375 mg/l × 50/0.5594 × .0001 = 0.01% Chlorine								

CHLORINE, BOMBING — TITRATION

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mV readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
12/8/99	1384801 188433	50/0.5769	[illegible]			1.864 mg/L	× 50/0.5769	× .0001	=	0.02 % Chlorine			
	1384802	50/0.5146				< 1.00	× 50/0.5146	× .0001	=	< 0.01 % Chlorine			
	1384803	50/0.5543				< 1.00	× 50/0.5543	× .0001	=	< 0.01 % Chlorine			
	1384806 188435	50/0.5422				13.232	× 50/0.5422	× .0001	=	0.12 % Chlorine			
12/9/99	1384802 Dup	50/0.5654				13.245	× 50/0.5654	× .0001	=	0.12 % Chlorine			

Moisture

rev 1.0 - 3/10/99

	Sample #	Tare wt. of Dish (g)	Wet Wt. Sample + Dish (g)	Dry Wt. Sample + Dish	% Moisture	
435	1384806	428.9	1259.9	1231.8	3.38	12/1/99
	1384807	421.5	1442.6	1407	3.49	
	1384808	428	1475.3	1437.7	3.59	
437	1384812	461.7	773.3	755.5	5.71	12/1/99
	1384813	434.3	811	787.8	6.16	
	1384814	433.1	676.4	660.4	6.58	
427	1384787	431.1	1792	1692.6	7.30	12/1/99
	1384788	428.9	1792.6	1660.7	9.67	
	1384789	428.1	1564	1459.4	9.21	
446	1384908	423.3	1618.1	1479.4	11.6	12/2/99
	1384909	436.4	1520.5	1383.4	12.6	
	1384910	427.1	1380.4	1248.4	13.8	

ID CODE C01384792 WTD.245 CAL.
Metco SULFUR .542
13:51 12/08/9
ID CODE C01384793 WTD.269 CAL.
SULFUR .43
188429 13:53 12/08/9
ID CODE C01384794 WTD.272 CAL.
SULFUR .41
13:56 12/08/9

ID CODE C01384796 WTD.281 CAL.
Metco FILTER .4
13:58 12/08/9
ID CODE C01384797 WTD.287 CAL.
ID CODE C01384797 WTD.287 CAL.
188431 SULFUR .4
14:09 12/08/9
ID CODE C01384798 WTD.288 CAL.
SULFUR .4
14:12 12/08/9

ID CODE C01384801 WTD.294 CAL.
Metco
ID CODE C01384802 WTD.294 CAL.
14:18 12/08/9
ID CODE C01384803 WTD.298 CAL.
188433 SULFUR .
14:21 12/08/9
ID CODE C01384804 WTD.304 CAL.
188435 SULFUR .
14:40 12/08/9
ID CODE C01384807 WTD.317 CAL.
Metco SULFUR 1.49
14:44 12/08/9
ID CODE C01384808 WTD.318 CAL.
SULFUR 1.41
AIR CHANGE FILTERS

Coal/RDF Proximate Analysis

DATE: 12/8/99

Signature: [illegible]

CLIENT	Mate-							
Laboratory Number	1384797	1384798	1384801	1384802	1384803	1384806	1384807	1384807 DUP1
all weights in grams								
% Air-dry Loss	5.51	4.96	26.0	6.58	8.07	3.34	3.49	
Weight of Crucible and Sample	21.2133	22.3748	19.2624	19.0073	20.9261	22.2092	21.4595	21.6164
Weight of Crucible	20.2332	21.3946	18.2756	17.8545	19.2604	21.1674	20.4835	20.6332
Weight of Sample	.9801	.9802	.9870	1.1528	1.0657	1.0418	1.0760	.9832
Weight of Crucible and Sample	21.2133	22.3748	19.2624	19.0073	20.9261	22.2092	21.4595	21.6164
Weight after 105 deg. C	21.2084	22.3701	19.2169	18.7369	20.6687	22.1889	21.4764	21.6040
Weight loss (moisture)	.0049	.0047	.0457	.2704	.2574	.0212	.0131	.0124
% Residual Moisture	0.50	0.48	4.63	23.5	24.1	2.03	1.30	1.24
Weight of Crucible and Sample				19.8906	19.5878			
Weight of Crucible				18.9000	18.6807			
Weight of Sample				.9906	.9071			
Weight of Crucible and Sample				19.8906	19.5878			
Weight after 950 deg. C for 7 min.				19.6572	19.3806			
Weight loss (Volatiles)				.2334	.2072			
% Volatiles				23.5	22.8			
% Residual Moisture								
% Volatile Matter	20.3159							
Weight after 750 deg. C	~~21.9528~~	21.5038	18.5209	18.0588	20.1092	21.3449	20.5749	20.7245
Weight of Crucible	20.2332	21.3946	18.2756	17.8545	19.2604	21.1674	20.4835	20.6332
Weight of Ash	.0837	.1092	.2453	.2043	.2488	.1775	.0924	.0913
% Ash	8.53	11.1	24.9	17.7	23.3	17.0	9.13	9.37
% Sulfur	4.52	4.58	1.22	0.96	1.09	0.89	1.49	
BTU per pound	13712	13281	9107	7523	6855	11971	13451	
BTU sulfur correction	104	105	28	22	25	20	34	
BTU per pound, corrected	13608	13176	9079	7501	6830	11951	13417	
BTU per pound, Moisture Ash Free								
	188431		188433			188435		

30

Coal/RDF Proximate Analysis

DATE: 12/9/99

Signature: V. O'neill

CLIENT	Control	Metro						
Laboratory Number	98	1384808	1384812	1384813	1384814	1384814 (Dup)	1384908	1384909
all weights in grams								
% Air-dry Loss		3.57	5.71	6.16	6.58		11.6	12.6
Weight of Crucible and Sample	23.0274	19.2332	22.9165	18.6722	21.2167	20.4690	21.6760	18.3184
Weight of Crucible	21.7890	18.3099	21.9169	17.6813	20.2533	19.3785	20.6199	17.1620
Weight of Sample	1.2384	.9233	.9996	.9909	.9634	1.0905	1.0561	1.1564
Weight of Crucible and Sample	23.0274	19.2332	22.9165	18.6722	21.2167	20.4690	21.6760 21.5105	18.3184
Weight after 105 deg. C	23.0157	19.2222	22.8560	18.6101	21.1675	20.4135	~~21.5098~~	19.5[illegible]
Weight loss (moisture)	.0117	.0110	.0605	.0621	.0492	.0555	.1655	.1584
% Residual Moisture	0.94	1.19 ~~11.9~~	6.05 ~~3.45~~	6.27	5.11	5.09	15.7	13.8
Weight of Crucible and Sample								
Weight of Crucible								
Weight of Sample								
Weight of Crucible and Sample								
Weight after 950 deg. C for 7 min.								
Weight loss (Volatiles)								
% Volatiles								
% Residual Moisture								
% Volatile Matter								
Weight after 750 deg. C	21.9369	18.3996	22.0758	17.8480	20.4111	19.5569	20.7217	17.2787
Weight of Crucible	21.7890	18.3099	21.9169	17.6813	20.2533	19.3785	20.6199	17.1620
Weight of Ash	.1479	.0897	.1589	.1667	.1578	.1784	.1018	.1167
% Ash	11.9	9.72	15.8 ~~8.76~~	16.8	16.4	16.4	9.64	10.1
% Sulfur		1.41	0.68	0.69	0.72		1.03	1.13
BTU per pound		13407	10143	9924	10155		9970	10142
BTU sulfur correction		32	16	16	16		24	26
BTU per pound, corrected		13375	10127	9908	10139		9946	10116
BTU per pound, Moisture Ash Free								
		188435	188437				188469	

Date	Lab No.	Client	BTU/Lbs	BTU/Lbs Sulfur	BTU/Gals	Remarks	Oper.
12/2/99	1384789	Metco	12330			188427	[illegible]
	1384792	"	11562			"	
	1384793	"	11524			188429	
	1384794	"	11843			"	
	1384796	"	13184			188431	
	1384797	"	13712			"	
Dup.	1384797	"	13686			"	
	1384798	"	13281			"	
	1384795	Kimberly C	09200			188430	
	1384801	Metco	09107			188433	
12/7/99							
	1384755	CCR	7240			188418	[illegible]
	1384756	"	7736			"	
	1384757	"	7493			"	
	1384694	Lehigh Univ	18348	18327		188398	
	1384695	"	18437	18418		"	
	1384802	Metco	7523	7523		188433	
	1384803	"	6855			"	
(Dup.)	1384803	"	6822			"	
	1384806	"	11971			188435	
	1384807	"	13451			"	
	1384808	"	13407			"	
	1384812	"	10743			188437	
	1384813	"	9924			"	
	1384814	"	10155			"	
(Dup)	1384814	"	10155			"	
	1384908	"	9970			188461	
	1384909	"	10141			"	
	1384910	"	10516			"	
	1384815	Raytheon	Raytheon	18176		188439	
(Dup)	1384910	~~[illegible]~~	10535			188461	
	1384816	Raytheon	18772			188439	
	1384817	"	19556			"	
	1384818	"	19602			"	
	1384819	"	18617			"	
	1385280	Maine Env.	18813			188536	
	1385377	Merck	19397			188553	
	1385401	Budd Co.	~~Kimberly~~	18723		188561	
	1385410	Kimberly Cl.	9257			188565	
(Dup)	1385280	Maine Env.	18398			188536	

TestAmerica
INCORPORATED

Sample ID: Ohio Edison Power Company
WH Sammis Power Plant
Stratton, Ohio
Coal Samples

Hg Analysis
ASTM D6414-99

Collected On: 9/23/99 for Run 1, 9/24/99 for Run 2 and Run 3 Composites
Collected By: METCO

	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Units	Dry Weight (%)	Flags	Notes
Run 1 Composite	12/20/99	12/24/99	jpp	0.081	0.081	<1.0	ug/g	98.2		
Run 2 Composite	12/20/99	12/24/99	jpp	0.120	0.121	1.2	ug/g	98.9		
Run 3 Composite	12/20/99	12/24/99	jpp	0.117	0.117	<1.0	ug/g	98.9		

Notes:

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

Sample Receipt Record

Chain of Custody Provided? Yes ☐ No ☒ Job #: _____

If no Chain of Custody is provided, the following section should be completed.

Client: METCO
Received by: James A. Davis Date: 12/6/99 Time: 9 AM
Samples Shipped UPS FEDEX US Mail Other _____
Custody Seal(s) Intact ~~Yes ☐ No ☐~~
Containers Provided by TestAmerica Yes ☐ No ☒
Cooler Temperature _____ °C Ice Ambient Cool Packs

Deviations Noted

- None ☐
- Insufficient Volume ☐
- Samples Broken ☐
- Incorrect Containers/ Preservatives ☐
- Volatile Headspace ☐
- Holding Time Exceeded upon receipt ☐
- Insufficient sample information ☐
- COC and sample labels disagree ☐

Comments

FROM PHILIP ANAL.
COAL FROM:
OWENSVILLE, EAST CHINA, COLSTRIP
WEST TERRE HAUTE, STEVENSON,
SHIPPINGPORT, STRATTON, BREMOND
PADUCAH, LAWRENCE, FAIRFIELD

Other _____ Initials _____ Date _____

Issues to Clarify with Client

Corrective Action

Client Contacted by: N/A Date: N/A

TestAmerica INCORPORATED

PHILIP ANALYTICAL SERVICES

Chain of Custody Record

4418 Pottsville Pike Reading, PA 19605
phone: (610) 921-8833 fax: (610) 821-9667

Sample Container Information

Bottle Type (G P H)												
# of Containers												
Preserved? (Y/N)												

Report Results To:
PO # 99-95-WHS | Job ID UNIT 1-OHEO./EAMMIS
Name DOUG SAOTHOFF
Company METCO ENVIRONMENTAL
Mailing Address P.O. Box 598
City ADDISON State TX Zip 75025
Telephone # 972/931/7127 Fax # 972/931/3398

Send Invoice To:
Name SAME Telephone #
Company Dept.
Mailing Address
City State Zip
Credit Card # Exp. Date

Page 1 of 1
PAS Quote#

Analysis Requested: BTU CONTENT; FLY ASH; SULFUR; CHLORIDE; ASTM-D-3286; ASTM-D-3174; ASTM-D-5016

Sampled by:

		SAMPLE DESCRIPTION	Air Vol. (L or min)	Matrix Type	Date Sampled	Time Sampled	BTU CONTENT	FLY ASH	SULFUR	CHLORIDE	Comments/Hazards/Location Details
FAR 1-3	1.	RUN 1 COAL COMP.			9/23/99	1700	X	X	X	X	ATTN CHRIS WEATHINGTON
JAR 1-4	2	RUN 2 COAL COMP.			9/24/99	0900	X	X	X	X	TEST AMERICA, INC.
JAR 1-4	3	RUN 3 COAL COMP.			9/24/99	1100	X	X	X	X	3601 S. DIXIE DRIVE
11 TOTAL	4										DAYTON, OH 45439
	5	*SEE ATTACHED									PH: 1-800-572-9839
	6	INSTRUCTIONS									* AFTER SAMPLE HAS BEEN
	7	→									PREPPED. PLEASE RETURN A
	8										4 oz. JAR SAMPLE TO TEST
	9										AMERICA AT THE ABOVE
	10										ADDRESS. THANK YOU!

Special Instructions (including Data Deliverables and Turn Around Time):

Samples relinquished to shipper or courier by: Steve D. Sells	Date 11/19/99	Time 1530	
Samples received by:	Date	Time	

Samples Relinquished by:	Samples Relinquished to:	Date	Time
Samples Relinquished by:	Samples Relinquished to Laboratory:	Date	Time

Method of Shipment/Delivery: UPS FED-EX PAS Courier Client drop off Other

Samples Rec'd. on ice? (Y N n/a) Temp. Blank ____ Sample Temp. ____
Samples rec'd intact? (Y N) . Custody seals intact? (Y N n/a) ID on samples match COC? (Y N)
VOC Samples have zero headspace? (Y N n/a) Samples properly preserved? (Y N n/a)

Notes:

TOTAL P.06

NONAQUEOUS MERCURY BATCH SHEET

Analyst: JRP Date: 12/20/99 12/24/99 Water Bath: start mid end

Standard Reference: 65-41-7 temp:

ICV Reference: 65-41-18 date:

% DW		Sample # / Client	Weight	MS	MSD
83.1	3	1383831 [redacted]	1.0083 g		
82.6	4	1383832	1.0242 g		
83.7	5	1383833	1.0469 g		
95.1	6	1384792 [redacted]	1.0235 g		
94.1	7	1384793	1.0080 g		
96.0	8	1384794	1.0522 g		
93.7	9	1384812 TRP [redacted]	1.0296 g		
93.7	10	1384813 SPK	1.0235 g		
94.5	11	1384814	1.0070 g		
95.3	12	1384777 [redacted]	1.0644 g		
95.4	13	1384778	1.0445 g		
95.5	14	1384779	1.0288 g		
98.2	15	1384806 Sammis	1.0170 g		
98.9	16	1384807	1.0099 g		
98.9	17	1384808	1.0222 g		
90.3	18	1384771 [redacted]	1.0139 g		
89.8	19	1384772 TRP	1.0105 g		
90.1	20	1384773 SPK	1.0365 g		
	2	NIST 1630 A	1.0390 g	=0.077 mg/kg	
	1	Blank			

MB

ICV

MS

MSD

RPD

FLAG

HNO_3 65-48-14

HCl 65-46-1

$KMnO_4$ -65-33-1

~~$SnCl_2$ 65-50-6~~

$SnCl_2$ -66-31-19

SECONDARY DATA CHECK: analyst:
date:

Comments: V_F = 50 mL NIST 1630A = 0.106 ± ~~0.023~~ 0.032 mg/kg JAD 1/6

Protocol: SYSTEST

Rev: 2.00 Time: 17:51:34 24 Dec 1988

Folder: TEST Seq: 247 Prior: 0

User: Batch: Inj cpy Dur: 1 Ff Gas: 0.00 LPM

Stage: Idle Unit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 1024PS:

Vue Id	Extended Id	Weight	Volume	Macro check help
1 tes		1.0000	1.0000	
2 tik		1.0000	1.0000	
3 tik aus		1.0000	1.0000	
4 nietlisbe		1.0000	1.0000	
5 niet aus		1.0000	1.0000	
6 EX1 ~~1.5~~ NODIL		1.0000	1.0000	
7 EX1 aus		1.0000	1.0000	
8 EX2		1.0000	1.0000	
9 EX2 aus		1.0000	1.0000	
10 EX3		1.0000	1.0000	
11 EX3 aus		1.0000	1.0000	
12 TF2		1.0000	1.0000	
13 TF2 aus		1.0000	1.0000	
14 TF1		1.0000	1.0000	
15 TF1 aus		1.0000	1.0000	

Page

Cue 1 Id: .10 Tell entry, Ins to accept

Id# 5 12

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 17:53:07  24 Dec 1999
Falcon: 1E0990      Seq: 340                    Print: On
Laser:              Seton:            Inj: 100        Dual: 1.39 Gas:    0.23 LPM
Stage: Idle                                           Unit: Off Autosampler: On

AUTOSAMPLER:  Pack entry   Pack 1ZONEs  Range  1-44 Clear ead Load exit    Equi
Cup Id        Expanded Id              Weight Volume Name  Track Help
16 TS2                                 1.0000 1.0000
17 TS2 cup                             1.0000 1.0000
18 S12                                 1.0000 1.0000
19 S12 cup                             1.0000 1.0000
20 S12 ***                             1.0000 1.0000
21 S13                                 1.0000 1.0000
22 S13 cup                             1.0000 1.0000
23 S13 ***                             1.0000 1.0000
24 ccc                                 1.0000 1.0000
25 ccc                                 1.0000 1.0000
26 S14                                 1.0000 1.0000
27 S14 cup                             1.0000 1.0000
28 ***                                 1.0000 1.0000
29 *** cup                             1.0000 1.0000
30 ***                                 1.0000 1.0000
                                                                          Fsln

                                                 Idlan entry, Ins to enter
                                                                   Dil F  I
```

Protocol: SYSTEST

Rev: 3.401 Time: 17:53:[illegible] 24 Dec 1995

Filen: DEC95C Seq: 242 Print: On

User: Seton: Id: 110 Cust: 1 19 Seq: 0.23.1PM

State: Idle Unit: 1PP Autosamplen: On

AUTOSAMPLER: Out Id	Rack entry Interface Id	Rack 1D2495s Weight	Volume	Range Name	1-M Item	Clear seq	Wash	exit	Flus
01 773	out	1.0000	1.0000						
02 773		1.0000	1.0000						
03 773	out	1.0000	1.0000						
04 806		1.0000	1.0000						
05 806	out	1.0000	1.0000						
06 807		1.0000	1.0000						
07 807	out	1.0000	1.0000						
08 808		1.0000	1.0000						
09 808	out	1.0000	1.0000						
40 771		1.0000	1.0000						
41 771	out	1.0000	1.0000						
42 772		1.0000	1.0000						
43 772	out	1.0000	1.0000						
44 772	772	1.0000	1.0000						

Fin

[illegible]

*** Standard: 1 Rep: 1 Seq: 292 15:35:21 24 Dec 1999 HG

Hg .000 ug/L 172
Ave. Int. = 172 S. D. = 0

Folder: DEC99C Page 258
15:37:42 24 Dec 1999 Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 2 Rep: 1 Seq: 293 15:37:43 24 Dec 1999 HG

Hg .200 ug/L 8051
Ave. Int. = 8051 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 294 15:40:05 24 Dec 1999 HG

Hg .500 ug/L 20347
Ave. Int. = 20347 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 295 15:42:27 24 Dec 1999 HG

Hg 1.00 ug/L 40126
Ave. Int. = 40126 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 296 15:44:54 24 Dec 1999 HG

Hg 2.00 ug/L 81928
Ave. Int. = 81928 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 297 15:47:23 24 Dec 1999 HG

Hg 3.00 ug/L 120049
Ave. Int. = 120049 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 15:48:16 24 Dec 1999

Folder: DEC99C Seq: Z98 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 29 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

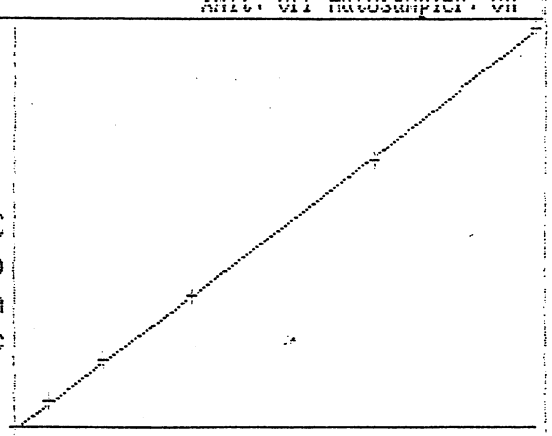
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	-.001	-.001	Quadratic	
S2	.200	.195	-.005	UtdLinear	
S3	.500	.501	.001		C
S4	1.00	.993	-.007	Accept	o
S5	2.00	2.03	.032		n
S6	3.00	2.98	-.019	StdAdd	c

A .0000000 r .999889

B 2.48732e-5 C -5.41651e-3



Relative Absorbance

	Mean	%RSD
S1	172	0
S2	8051	0
S3	20347	0
S4	40126	0
S5	81928	0
S6	120849	0

33?

New calibration coefficients stored 149 2 5

Folder: [illegible]
17:55:12 24 Dec 1995 Program: EXTRACT

Name	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: [illegible]					Seq: [illegible]	17:55:12 24 Dec 1995 -6		
Hg	-.005	ug/L	.000	-.005				
*** Sample ID: [illegible]					Seq: [illegible]	17:58:12 24 Dec 1995 -6		
Hg	.010	ug/L	.000	.010				
*** Sample ID: [illegible]					Seq: [illegible]	18:00:44 24 Dec 1995 -6		
Hg	.005	ug/L	.000	.005				
*** Sample ID: [illegible]					Seq: [illegible]	18:03:02 24 Dec 1995 -6		
Hg	1.87	ug/L	.000	1.87				
*** Sample ID: [illegible]					Seq: [illegible]	18:15:23 24 Dec 1995 -6		
Hg	1.80	ug/L	.000	1.80				
[illegible]					Seq: [illegible]	[illegible]		
Hg	.172	ug/L	.000	.172				
*** Sample ID: [illegible]					Seq: [illegible]	18:11:05 24 Dec 1995 -6		
Hg	1.01	ug/L	.000	1.11				
*** Sample ID: [illegible]					Seq: [illegible]	18:13:23 24 Dec 1995 -6		
Hg	1.02	ug/L	.000	1.02				
*** Sample ID: [illegible]					Seq: [illegible]	18:15:45 24 Dec 1995 -6		
Hg	.538	ug/L	.000	.538				
*** Sample ID: [illegible]					Seq: [illegible]	18:18:44 24 Dec 1995 -6		
Hg	.517	ug/L	.000	.517				
*** Sample ID: [illegible]					Seq: [illegible]	18:20:22 24 Dec 1995 -6		
Hg	1.21	ug/L	.000	1.21				
*** Sample ID: [illegible]					Seq: [illegible]	18:22:44 24 Dec 1995 -6		
Hg	[illegible]	[illegible]	[illegible]	[illegible]				

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 752				Seq: 156		18:23:04 24 Dec 1999 -6			
Hg	1.02	ug/L	.000	1.02					0.052 µg/g
*** Sample ID: 752 dup				Seq: 156		18:27:24 24 Dec 1999 -6			RPD = <1.0%
Hg	1.02	ug/L	.000	1.02					0.052 µg/g
*** Sample ID: 753				Seq: 157		18:29:44 24 Dec 1999 -6			
Hg	.844	ug/L	.000	.844					0.044 µg/g
*** Sample ID: 753 dup				Seq: 158		18:32:03 24 Dec 1999 -6			RPD = 1.6%
Hg	.852	ug/L	.000	.852					0.045 µg/g
*** Sample ID: 754				Seq: 159		18:34:22 24 Dec 1999 -6			
Hg	.947	ug/L	.000	.947					0.047 µg/g
*** Sample ID: 754 dup				Seq: 160		18:36:41 24 Dec 1999 -6			RPD = <1.0%
Hg	.950	ug/L	.000	.95					0.047 µg/g ~~0.048 µg/g~~ mm 12/28/99
*** Sample ID: 812				Seq: 161		18:37:01 24 Dec 1999 -6			
Hg	1.21	ug/L	.000	1.21					0.063 µg/g
*** Sample ID: 812 dup				Seq: 162		18:41:19 24 Dec 1999 -6			RPD = <1.0%
Hg	1.20	ug/L	.000	1.20					0.062 µg/g
*** Sample ID: 812 [illegible]				Seq: 163		18:42:38 24 Dec 1999 -6			RPD = 2.5%
Hg	1.18	ug/L	.000	1.18					0.061 µg/g
*** Sample ID: [illegible]				Seq: 164		18:45:57 24 Dec 1999 -6			
Hg	1.28	ug/L	.000	1.28					0.066 µg/g
*** Sample ID: 812 dup				Seq: 165		18:48:21 24 Dec 1999 -6			RPD = 2.4%
Hg	1.29	ug/L	.000	1.29					0.067 µg/g
*** Sample ID: 812 sck				Seq: 166		18:50:41 24 Dec 1999 -6			
Hg	[illegible]	ug/L	.000	[illegible]					TV = ~~2.0~~ 1.0 mm 12/28/99 90%

Polcam: DEC99C
Protocol: SYSTEST

18:53:12 24 Dec 1999

Analyte	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ccb					Seq: 267	18:53:12 24 Dec 1999 -6		
Hg	-.029	ug/L	.000	-.029				
*** Sample ID: ccv					Seq: 268	18:55:31 24 Dec 1999 -6		
Hg	2.06	ug/L	.000	2.06				
*** Sample ID: [illegible]					Seq: [illegible]	[illegible] 24 Dec 1999 -6		
Hg	1.28	ug/L	.000	1.28				
*** Sample ID: 814 dup					Seq: 274	19:00:21 24 Dec 1999 -6		
Hg	1.28	ug/L	.000	1.28				
*** Sample ID: 777					Seq: 271	19:02:4[illegible] 24 Dec 1999 -6		
Hg	.595	ug/L	.000	.595				
*** Sample ID: 777 dup					Seq: 272	19:05:0[illegible] 24 Dec 1999 -6		
Hg	.597	ug/L	.000	.597				
*** Sample ID: 778					Seq: 273	19:07:15 24 Dec 1999 -6		
Hg	.454	ug/L	.000	.454				
*** Sample ID: 778 dup					Seq: 274	19:09:35 24 Dec 1999 -6		
Hg	.457	ug/L	.000	.457				
*** Sample ID: [illegible]					Seq: 275	19:11:52 24 Dec 1999 -6		
Hg	.404	ug/L	.000	.404				
*** Sample ID: 779 dup					Seq: 276	19:14:17 24 Dec 1999 -6		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
*** Sample ID: 8[illegible]					Seq: 277	-19:16:37 24 Dec 1999 -6		
Hg	1.62	ug/L	.000	1.62				
*** Sample ID: 8[illegible] dup					Seq: 278	19:19:02 24 Dec 1999 -6		
Hg	1.61	ug/L	.000	1.61				

< 0.2 µg/L

TV = 2.0

103%

0.067 µg/g

RPD = < 1.0%

0.067 µg/g

0.029 µg/g

RPD = 1.3%

0.029 µg/g

0.024 µg/g

RPD = < 1.0%

0.024 µg/g

0.021 µg/g

RPD = 1.9%

0.021 µg/g

STATION

0.081 µg/g

RPD = < 1.0%

0.081 µg/g

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 867					Seq: 37	19:21:26 24 Dec 1999 -6		
Hg	1.39	ug/L	.000	1.39				
*** Sample ID: 867 dup					Seq: 38	19:22:52 24 Dec 1999 -6		
Hg	1.42	ug/L	.000	1.42				
*** Sample ID: 868					Seq: 39	19:24:24 24 Dec 1999 -6		
Hg	1.07	ug/L	.000	1.07				
*** Sample ID: 868 dup					Seq: 40	19:25:51 24 Dec 1999 -6		
Hg	1.06	ug/L	.000	1.06				
*** Sample ID: [illegible]					Seq: 41	19:27:18 24 Dec 1999 -6		
Hg	1.19	ug/L	.000	1.19				
*** Sample ID: 771 dup					Seq: 42	19:28:45 24 Dec 1999 -6		
Hg	1.21	ug/L	.000	1.21				
*** Sample ID: 772					Seq: 43	19:30:12 24 Dec 1999 -6		
Hg	1.22	ug/L	.000	1.22				
*** Sample ID: 772 dup					Seq: 44	19:31:38 24 Dec 1999 -6		
Hg	1.24	ug/L	.000	1.24				
*** Sample ID: 772 trp					Seq: 45	19:33:04 24 Dec 1999 -6		
Hg	1.27	ug/L	.000	1.27				
*** Sample ID: 773					Seq: 46	19:34:31 24 Dec 1999 -6		
Hg	1.31	ug/L	.000	1.31				
*** Sample ID: 773 dup					Seq: 47	19:35:57 24 Dec 1999 -6		
Hg	1.36	ug/L	.000	1.36				
*** Sample ID: 777 ec					Seq: 48	19:37:23 24 Dec 1999 -6		
Hg	[illegible]	ug/L	[illegible]	[illegible]				

STRATION

0.120 µg/g

RPD = 1.2%

0.121 µg/g

0.117 µg/g

RPD = <1.0%

0.117 µg/g

0.065 µg/g

RPD = 1.7%

0.066 µg/g

~~0.067~~

0.068 µg/g

RPD = <1.0%

0.068 µg/g

RPD = 3.2%

0.070 µg/g

0.070 µg/g

RPD = <1.0%

0.069 µg/g

TV = 1.0

97%

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ccc				Seq: 271	19:51:45 24 Dec 1990			
Hg	-.025	ug/L	.000	-.025				
*** Sample ID: cc.				Seq: 272	19:54:03 24 Dec 1990			
Hg	1.05	ug/L	.000	1.05				

<0.2µg/L

TV=2.0

103%

Dry Weight(DW)/Total Volatile Solids (TVS) Notebook # 6

Sample Number/ Test (DW/TVS)	1386554	1386555	1386556	1384734	[illegible]	[illegible]
Client/Pan #	BB R1 1	BB R2 2	BB R3 3	GIBSON R1 4	GIBSON R2 5	GIBSON R3 6
Wt of Pan + Sample	6.6673	8.1660	5.8079	9.89[illegible]9	10.9649	11.7093
Wt after Drying	5.9013	6.9834	5.0069	9.2599	10.3443	11.0886
Wt of Pan or Wt After Ignition	0.9782	0.9820	0.[illegible]836	0.9849	0.9842	0.9783
Difference	4.9231	6.00[illegible]	4.0233	8.2750	9.3601	10.1103
Sample amount g	5.6891	7.1840	4.8243	8.9120	9.9807	10.7310
Result	[illegible]	[illegible] %	[illegible] %	[illegible] %	[illegible] %	[illegible] %

Sample Number/ Test (DW/TVS)	1384806	1384807	1384808	1384777	[illegible]	[illegible]78
Client/Pan #	JAMMIS R1 7	—— R2 8	—— R3 9	WIDOWS CRK 10 R1	—— 11 R1	—→ R2
Wt of Pan + Sample	10.1893	8.7366	9.8541	7.0504	6.69[illegible]2	11.7089
Wt after Drying	10.0258	8.6516	9.7607	6.7662	6.4253	11.2141
Wt of Pan or Wt After Ignition	0.9782	0.9775	0.9737	0.9801	0.9801	0.9784
Difference	9.0476	7.6741	8.7870	5.786[illegible]	5.4452	10.2357
Sample amount g	9.2111	7.7571	8.8804	6.[illegible]703	5.7111	10.7305
Result	98.2%	98.9%	98.9%	[illegible] %	[illegible]	[illegible] %

Sample Number/ Test (DW/TVS)	[illegible]	1384812	1384813	[illegible]14
Client/Pan #	WIDOWS CRK 13 R3	MONTANA 14 R1	—→ 15 R2	[illegible] R3
Wt of Pan + Sample	7.2461	8.0743	7.70[illegible]9	6.3980
Wt after Drying	6.9648	7.6309	7.[illegible]845	6.0976
Wt of Pan or Wt After Ignition	0.9778	0.98[illegible]	0.9812	0.9779
Difference	5.9870	6.6507	6.3033	5.1197
Sample amount g	6.2680	7.0941	6.7287	5.4201
Result	[illegible] %	[illegible] %	[illegible] %	[illegible] %

Batch Number —
TVS -
DW - 3395

Note:
METCO COALS
CONTD -

TestAmerica INCORPORATED

Analyst: LP Date: 12/21/99

UNIT 1: MERCURY TEST DATA - 9/23/99

(Take Data every 15 minutes during test runs.)

	RUN	1	1	1	1	1	1	1	1
EXT 1760 #1 CR	TIME	1510	1525	1540	1555	1610	1625	1640	1655
	Steam Flow (KPPH)	341.6	338.5	337.0	338.1	339.3	337.9	340.0	337.5
CR	~~Gross~~ NET MW	177	176	177	177	177	177	177	177
AGC	Baghouse Press. Drop (" water) G. DIFF / R. OUTLET	6.2 / -6.0	5.6 / -6.0	5.7 / -6.0	6.0 / -6.0	6.3 / -6.0	6.0 / -6.0	5.8 / -6.0	6.0 / -6.0
AGC	Baghouse Temp Inlet/Outlet (F) R / G	320 / 310	310 / 300	310 / 300	310 / 300	310 / 300	310 / 300	310 / 300	310 / 300
#1 CR	Mills In Service	5	5	5	5	5	5	5	5
#1 CR	Coal Flow (Tons per Hour)	115.86 KLB/HR [redacted]	118.0 [redacted]	118.6 [redacted]	118.6 [redacted]	118.6 [redacted]	118.6 [redacted]	118.6 [redacted]	115.8 [redacted]
BOILER CEM	CO2 (%)	11.76	11.94	11.98	11.88	11.92	11.94	11.94	11.70
CHIMNEY CEM	SO2 – Stack 1 (lbs/mmBTU)	1.77	1.76	1.77	1.76	1.77	1.79	1.77	1.75
BOILER CEM	NOX (lbs/mmBTU)	0.553	0.548	0.546	0.536	0.535	0.537	0.535	0.537
CHIMNEY CEM	Stack 1 Flow (KSCFM)	58239	58298	58057	57524	57614	57551	57848	58119
	COMMENTS								

UNIT 1: MERCURY TEST DATA - 9/23/99

(Take Data every 15 minutes during test runs.)

RUN	1	1	1	1	1	1	1	1
TIME	19:10	19:25	19:40	19:55	20:10	20:25	20:40	20:55
Steam Flow (KPPH)	1315.8	Avg = 1,330.2						
~~Gross~~ NET MW	177	Avg = 177						
Baghouse Press. Drop (" water)	5.5 -6.0	5.97						
Baghouse Temp Inlet/Outlet (F)	310 300	311 301						
Mills In Service	5	Avg: 5						
Coal Flow (Tons per Hour) Klb/hr	115.16	Avg = 117.6						
CO2 (%)	11.92	Avg = 11.88						
SO2 – Stack 1 (lbs/mmBTU)	1.74	Avg = 1.75						
NOX (lbs/mmBTU)	.528	Avg = 0.534						
Stack 1 Flow (KSCFM)	58109	Avg = 58,060						
COMMENTS								

UNIT 1: MERCURY TEST DATA - 9/24/99

(Take Data every 15 minutes during test runs.)

RUN	2	2	2	2	2	2	2	2
TIME	0755	0810	0825	0840	0855	0910	0925	0940
Steam Flow (KPPH)	1371.6	1324.0	1387.8	1325.2	1378.8	1378.0	1327.5	1329.7
~~Gross~~ NET MW	177	177	177	177	177	177	178	177
Baghouse Press. Drop (" water)	6	5.5	6	5.8	6.5	6	6.2	6
	6	6	6	6	6	6	6	6
Baghouse Temp Inlet/Outlet (F)	305	305	305	305	305	305	305	305
	290	290	290	290	290	290	290	290
Mills In Service	5	5	5	5	5	5	5	5
~~KPB~~ KLB/HR Coal Flow ~~(Tons per Hour)~~	109.19	111.69	110.62	112.43	111.27	111.98	111.92	112.99
CO2 (%)	11.80	11.83	11.70	12.53	11.70	11.74	11.68	11.90
SO2 – Stack 1 (lbs/mmBTU)	1.98	1.98	1.97	1.96	2.04	2.02	2.02	2.02
NOX (lbs/mmBTU)	.570	.573	.536	.574	.547	.542	.547	.513
Stack 1 Flow (KSCFM)	57853	57889	57893	58395	57596	57069	58088	56723
COMMENTS								

UNIT 1: MERCURY TEST DATA - 9/24/99

(Take Data every 15 minutes during test runs.)

RUN	2	2	2					
TIME	0955	1010	1025					
Steam Flow (KPPH)	1329.5	1332.6	Avg: 1,327.8					
~~Gross~~ NET MW	177	178	Avg=177					
Baghouse Press. Drop (" water)	6.1	6	6.01					
	6	6						
Baghouse Temp Inlet/Outlet (F)	305	305	Avg = 305					
	290	290	" 290					
Mills In Service	5	5	Avg = 5					
Coal Flow (~~Tons per Hour~~) KLB/HR	114.15	112.40	Avg=111.86					
CO2 (%)	11.88	11.89	Avg= 11.87					
SO2 – Stack 1 (lbs/mmBTU)	2.07	2.16	Avg= 2.02					
NOX (lbs/mmBTU)	.572	.576	Avg: 0.530					
Stack 1 Flow (KSCFM)	57171	57515	Avg = 57,619					
COMMENTS								

UNIT 1: MERCURY TEST DATA - 9/24/99

(Take Data every 15 minutes during test runs.)

RUN	3	3	3	3	3	3	3	3
TIME	1150	1205	1220	1235	1250	1305	1320	1335
Steam Flow (KPPH)	1333.7	1328.4	1326.9	1328.4	1337.0	1327.7	1324.6	1337.0
~~Gross~~ NET MW	178	177	176	178	178	177	177	178
Baghouse Press. Drop (" water)	5.8	5.6	6	5.8	6	5.5	6.2	6
	6	6	6	6	6	6	6	6
Baghouse Temp Inlet/Outlet (F)	305	305	305	305	305	305	305	305
	290	290	290	290	290	290	290	290
Mills In Service	5	5	5	5	5	5	5	5
Coal Flow ~~(Tons per Hour)~~ KLB/HR	111.59	112.20	111.97	109.16	117.11	111.73	112.21	112.66
CO2 (%)	11.86	11.76	11.94	11.78	11.68	11.78	11.94	11.99
SO2 – Stack 1 (lbs/mmBTU)	2.14	2.19	2.20	2.17	2.18	2.18	2.16	2.17
NOX (lbs/mmBTU)	.523	.503	.507	.518	.499	.503	.507	.508
Stack 1 Flow (KSCFM)	57591	55369	56693	57466	56925	57235	57063	57063
COMMENTS								

UNIT 1: MERCURY TEST DATA - 9/24/99

(Take Data every 15 minutes during test runs.)

RUN	3	3	3	3	3			
TIME	1350	1405	1420	1435	1450			
Steam Flow (KPPH)	1333.5	1331.8	1373.7	1324.8	1326.1			
~~Gross~~ NET MW	178	178	178	177	177	Avg = 177		
Baghouse Press. Drop (" water)	6	6.2	6	5.8	5.91			
	6	6	6	6				
Baghouse Temp Inlet/Outlet (F)	305	305	305	305	Avg 305			
	290	290	290	290	Avg 290			
Mills In Service	5	5	5	5	5			
~~Coal Flow (Tons per Hour)~~ KLB/HR	110.54	111.44	108.59	110.51	110.70	Avg 111.18		
CO2 (%)	11.88	12.03	11.99	11.96	Avg 11.88			
SO2 – Stack 1 (lbs/mmBTU)	2.19	2.20	2.17	2.20				
NOX (lbs/mmBTU)	.505	.507	.506	.502	Avg 0.504			
Stack 1 Flow (KSCFM)	57031	56818	56995	55356				
COMMENTS								

APPENDIX F

Chain of Custody Records

Job# 99-75 W... Unit Tested Unit Number 1 Inlet Duct **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location
Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
METCO

Unit Number 1 Baghouse Run 1 Inlet Duct SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze per Instruction
Container 1 thimble filter	9/23	2105	x				II	BH									x			Ship to METCO En weight thimble Q1 filter 47Q25
Container 2 0.1 N HNO_3 Rinse FW	9/23	2108	x				I	BH									x			
Container 3 0.1 N HNO_3 ~~FW~~ Rinse BH Impinger 1,2,3	9/23	2120	x				II	BH									x			
Container 4 0.1 N HNO_3 Rinse Impinger 4	9/23	2126	x				I	BH									x			~~Used Hydroxylamine Sulfate~~ BH
Container 5 0.1 N HNO_3 Rinse Impinger 5,6,7	9/23	2136	x				II	BH									x			Used Hydroxylamine Sulfate / Sodium Chloride

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
			Shane Lee	9/25/99	1400	[illegible]	9/25/99	14:00
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		
			JRM	12/22/99	1000			

Ship to: TEST AMERICA

METCO ENVIRONMENTAL

F-2

Job# 99-95 W1 Unit Tested Unit 1 Baghouse **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location
Ohio Edison Power Company
W H Sammis Power Plant
~~Unit Num~~ Stratton, OH

Collected By/Company
METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Unit 1 Baghouse Inlet Duct Run Number 2																				Analyze per Instruction
Container 1 Filter	9/24/99	1300	X				II	BH									X			Ship to METCO for filter weight Trimble Q2, Filter 47028
Container 2 0.1 N HNO_3 F.W.	9/24/99	1302	X				I	BH									X			Container 2A not recovered
Container 3 10% HNO_3 Rinse Imp 1,2,3	9/24/99	1225	X				II	BH									X			
Container 4 0.1 N HNO_3 Rinse Imp 4	9/24/99	1231	X				I	BH									X			
Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	9/24/99	1249	X				I	BH									X			Used Hydroxylamine Sulfate/ sodium chloride.
	~~9/24/99~~																			

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
			Shane Lee	9/25/99	1400	[illegible]	9/25/99	14:00
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		
			[illegible]	12/22/99	1000			

Ship to: TestAmerica

METCO ENVIRONMENTAL

Job# 9945 WH31 Unit Tested Unit 1 Baghouse **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location
Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
METCO

SAMPLE I.D. Unit 1 Baghouse Inlet Duct Run 3	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze per Instruction
Container 1 Filter	9/24/99	1536	X				III	BH									X			Ship to METCO for weight Filter 47030 Thimbles Q8, Q12
Container 2 0.1 N HNO3 F.W.	9/24/99	1543	X				I	BH									X			Container 2A not recovered.
Container 3 10% HNO3 Rinse Imp 1,2,3	9/24/99	1554	X				II	BH									X			
Container 4 0.1 N HNO3 Rinse Imp 4	9/24/99	1610	X				I	BH									X			
Container 5 0.1 N HNO3 Imp. 5,6,7 Rinse	9/24/99	1623	X				I	BH									X			Hydroxylamine Sulfate Sodium Chloride Used

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
			Steve Lee	9/25/99	1400	[illegible]	9/25/99	14:00
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		
			JRM	12/22/99	1000			

Ship to: TestAmerica

METCO ENVIRONMENTAL

Job# 99-95WHS Unit Tested Unit 1 Baghouse

CHAIN OF CUSTODY RECORD

Page # 1/1

Facility Name/Location
Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Unit 1 Baghouse Inlet Duct Blank Train.																				Analyze per Instruction
Container 1 Filter	9/24/99		X				~~I~~	~~BH~~												Not Recovered.
Container 2 0.1 N HNO_3 Flow.	9/24/99		X				~~I~~	~~BH~~												Not Recovered.
Container 3 10% HNO_3 Rinse Imp 1,2,3	9/24/99	1150	X				I	BH									X			
Container 4 0.1 N HNO_3 Rinse Imp 4	9/24/99	1154	X				I	BH									X			
Container 5 0.1 N HNO_3 Rinse Imp. 5,6,7	9/24/99	1202	X				I	BH									X			

SAMPLE ANALYSIS REQUIRED

Received by:	Date:	Time:	Transported by: Shane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by: JM	Date: 12/22/99	Time: 1000	Remarks:		

Ship to: Test America

METCO ENVIRONMENTAL

Job# 99-95 WHS-1 Unit Tested Unit 1 Bag House Outlet **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location
Ohio Edison Power Company
Wlt Sammis Power Plant
Stratton, OH

Collected By/Company
METCO

Run 1 Unit 1 Baghouse South SAMPLE I.D. Outlet Duct	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	H2S			REMARKS (Specific Compounds/Methods)
																				Analyze per Instruction
Container 1 filter 47Q26	9/23	2025	X				I	BH									X			Ship to METCO for weight
Container 2 0.1 N HNO_3 Rinse FW							I	BH									X			
Container 3 10% HNO_3 Rinse Imp. 1,2+3	9/23	2030	X				II	BH									X			
Container 4 0.1 N HNO_3 Rinse Imp. 4	9/23	2030	X				I	BH									X			
Container 5 0.1 N HNO_3 Rinse Imp. 5,6+7	9/23	2030	X				II	BH									X			Used Hydroxylamine Sulfate / Sodium Chloride
~~Container 6~~ SL																				

Received by:	Date:	Time:	Transported by: Shane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by: RM	Date: 12/22/99	Time: 1000	Remarks:		

Ship to: Test America

METCO ENVIRONMENTAL

Job# 99-95WHP Unit Tested Unit 1 Baghouse

CHAIN OF CUSTODY RECORD

Page # 1

Facility Name/Location
Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
METCO Environmental

Unit 1 Baghouse South Outlet Duct SAMPLE I.D. Run 2	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze per Instruction
Container 1 Filter	9/24/99	1313	X				I	BH									X			Ship to METCO for Filter weight Filter 47Q
Container 2 0.1 N HNO3 F.W.	9/24/99	1315	X				I	BH									X			Container 2A not recovered.
Container 3 10% HNO3 Rinse Imp 1,2,3	9/24/99	1332	X				II	BH									X			
Container 4 0.1 N HNO3 Rinse Imp. 4	9/24/99	1343	X				I	BH									X			
Container 5 0.1 N HNO3 Rinse Imp 5,6,7	9/24/99	1356	X				I	BH									X			Used Hydroxylamine Sulfate/Sodium Chloride

Received by:	Date:	Time:	Transported by: Shane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by: fem	Date: 12/22/99	Time: 1000	Remarks:		

Ship to: Test America

METCO ENVIRONMENTAL

Job# 99-95WT Unit Tested Unit 1 Baghouse **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location: Ohio Edison Power Company, W.H. Sammis Plant, Stratton, OH

Collected By/Company: METCO

SAMPLE I.D. (Unit Number 1 Baghouse South Outlet Duct Run 3)	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Container 1 Filter 47Q27	9/24/99	1625	X				I	BH									X			Ship to METCO for weight
Container 2 0.1 N HNO_3 F.W.	9/24/99	1628	X				I	BH									X			Container 2A not recovered.
Container 3 10% HNO_3 F.W. Imp 1,2,3	9/24/99	1637	X				II	BH									X			
Container 4 0.1 N HNO_3 Rinse Imp 4	9/24/99	1640	X				I	BH									X			
Container 5 0.1 N HN Rinse Imp 5,6,7	9/24/99	1649	X				I	BH									X			used Hydroxylamine Sulfate/Sodium Chloride

Analyze per Instructions

Received by:	Date:	Time:	Transported by: Jane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by: RM	Date: 12/22/99	Time: 1000	Remarks:		

Ship to: TestAmerica

METCO ENVIRONMENTAL

Job# 99-95WHS1 Unit Tested Unit 1 Baghouse **CHAIN OF CUSTODY RECORD** Page # 1/1

Facility Name/Location
Ohio Edison Power Company
W H Sammis Power Plant
Stratton, OH

Collected By/Company
METCO Environmental

SAMPLE I.D. Unit 1 Baghouse South Outlet Blank Train	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze per Instruction Taken during Run 2.
Container 1 Filter	9/24/99																			Not Recovered
Container 2 0.1 N HNO_3 F.W.	9/24/99																			Not Recovered
Container 3 10% HNO_3 Rinse Imp 1,2,3	9/24/99	1005					I	BH												
Container 4 0.1 N HNO_3 Rinse Imp. 4	9/24/99	1009					I	BH												
Container 5 0.1 N HNO_3 Rinse Imps 5,6,7	9/24/99	1020					I	BH												Used Hydroxylamine Sulfate / Sodium Chloride

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
			Shane Lee	9/25/99	14:00		9/25/99	14:00
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		
			RM	12/22/99	1000			

Ship to: TestAmerica

METCO ENVIRONMENTAL

Job# 99-95WHS1 Unit Tested Unit 1 Baghouse

CHAIN OF CUSTODY RECORD

Page # 1/1

Facility Name/Location
OHioEdison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
METCO Environmental

Reagent Blanks SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze, per Instruction
✓ Container 7 0.1 N HNO_3 Blank	9/23/99	1748	X				I	BH									X			Vol. = 50 ml
✓ Container 8 1 M KCl Blank	9/23/99	1749	X				I	BH									X			Vol. = 50 ml
✓ Container 9 5% HNO_3 - 10% H_2O_2 Blank	9/23/99	1751	X				I	BH									X			Vol. = 51 ml
✓ Container 10 H_2SO_4 - $KMnO_4$ Blank	9/23/99	1754	X				I	BH									X			Vol. = 50 ml
✓ Container 11 Hydroxylamine Sulfate / Sodium Chloride	9/23/99	1757	X				I	BH									X			Vol. = 100 ml
Container 12 Thimbles Q5, Q7, Q17 Filters 47Q31, 47Q32, 47Q33	9/24/99	1450	X				IV	BH									X			3 Thimbles 3 47mm Backup filters

Received by:	Date:	Time:	Transported by: Shane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by: JCM	Date: 12/22/99	Time: 1000	Remarks:		

Ship to: TestAmerica

METCO ENVIRONMENTAL

F-10

Job# 99-95 WH51 Unit Tested Unit 1

CHAIN OF CUSTODY RECORD

Page # 1/1

Facility Name/Location
Ohio Edison Power Company
WH Sammis Power Plant
Stratton, OH

Collected By/Company
EL / First Energy

Fuel Samples
Ash Samples

SAMPLE I.D. Unit 1	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	ASH CONTENT	POHCs	SULFUR	METALS	Hg	CHLORINE	Heating Value	REMARKS (Specific Compounds/Methods)
Run 1 ~~Samm~~ Coal Composite	9/23/99	1700			✓		1	EL							✓		✓		✓	✓	✓	Analyze per Instruction
Run 2 Coal Composite	9/24/99	0900			✓		1	EL							✓		✓		✓	✓	✓	
Run 3 Coal Composite	9/24/99	1100			✓		1	EL							✓		✓		✓	✓	✓	
Run 1 Ash	9/23/99	1700			✓		1	EL											✓			
Run 2 Ash	9/24/99	0900			✓		1	EL											✓			
Run 3 Ash	9/24/99	1100			✓		1	EL											✓			

Received by:	Date:	Time:	Transported by: Shane Lee	Date: 9/25/99	Time: 1400	Received at Lab by:	Date: 9/25/99	Time: 14:00
Analyzed by:	Date:	Time:	Data Reviewed by:	Date:	Time:	Remarks:		

Ship to: Test America

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APPENDIX G

Resumes

METCO ENVIRONMENTAL

BILLY J. MULLINS, JR.; President

Education	Post Graduate Study Environmental Engineering at Southern Methodist University; Dallas, Texas 1970. M.S. 1969, New York University; New York, New York, in Civil Engineering (Air Resources). B.S. 1968, Texas Tech University; Lubbock, Texas, in Civil Engr. (Water Resources). Studies in Engineering at U.S. Naval Academy; Annapolis, Maryland, 1963-1964.
Professional Training Courses	Attended Short Course on Air Pollution Engineering at the University of Texas at Austin, February 1970. Attended four-week management course presented by the American Management Association, 1976.
Certification	Registered Professional Engineer Certified Visible Emissions Evaluator Licensed Private Pilot (Multi-Engine-Land, Instrument) Diplomat in the American Academy of Environmental Engineers Inductee into the Stack Sampling Hall of Fame Certified as Qualified Environmental Professional (QEP)
Professional Memberships	**Air & Waste Management Association** - Past Chairman, Past Vice Chairman, and Past Board of Directors of North Texas Chapter and Southwest Section; Past Chairman, Consultants Committee; Past Chairman, Source Measurement Committee **Source Evaluation Society** - Past President, Past Board of Directors **American Management Association**

MULLINS

Publications

Authored "Real World Experience with USEPA's New Sampling and Analytical Methods for Conducting Risk Burn," - May 1998.

Co-authored "Sulfur Compound Emissions of the Petroleum Production Industry," December 1974.

Co-authored "Field Procedure for Stabilizing Hydrogen Sulfide Samples to be Analyzed Using Modified Methylene Blue Technique," presented at the Conference on Ambient Air Quality Measurements, Austin, Texas, March 1975.

Co-authored "Atmospheric Emissions Survey of the Sour Gas Industry," October 1975.

Co-authored "Technique for Insuring the Validity of Samples for High Concentrations of Sulfur Dioxide Using the EPA Method 5 Sampling Train," presented at the Third National Conference on Energy and the Environment, College Corner, Ohio, September 1975.

Teaching Experience

Conducted training seminars on sampling methods periodically since 1974 to present.

Conducted a one-day seminar on Part 75 Testing over ten times in 1993 and 1994.

Served as a lecturer in the Environmental Protection Agency's training course number 450, "Source Sampling for Particulate Pollutants," for two years from January 1974 to October 1975 and in March, 1992.

Conducted a two-day training course entitled "Technical Assistance in Source Sampling" at Iowa State University, Ames, Iowa, for the Environmental Protection Agency, October 1974.

MULLINS

Teaching Experience (Cont'd)

Conducted EPA's training course number 450, "Source Sampling for Particulate Pollutants," for the EPA at Research Triangle Park, North Carolina, September 1975.

Conducted a two-day short course entitled "Performing and Observing Source Sampling" at Dallas, Texas; July 1976, May 1977, October 1977, November 1987 and November 1988; at Lake Charles, Louisiana, May 1977; at Casper, Wyoming, May 1977; and at Point Comfort, Texas, November 1992.

Served as a lecturer in the Environmental Protection Agency's two-day seminar entitled "Asphalt Industry Environmental Solutions," presented in Dallas, Texas, on March 21 and 22, 1979.

Conducted a two-day short course entitled "Performing and Observing Source Sampling" in Phoenix, Arizona in August, 1990 for the State of Arizona, Department of Environmental Quality; in Lincoln, Nebraska, in March 1980 for the State of Nebraska, Air Quality Control Division.

Technical Experience

Directed and performed stack sampling on over 2000 sources of which over 500 were sampled simultaneously using more than one sampling train at several points in the flue gas stream; 1972-present.

Directed and performed over 200 short-term ambient air studies using mobile sampling vans and various ambient air sampling equipment; 1972-present.

Designed, directed and operated over 20 permanent ambient air networks of various size and duration for a variety of parameters; 1972-present.

Designed surface and underground drainage systems for residential subdivisions, public works projects, and shopping centers; 1969-1972.

MULLINS

Designed several residential subdivisions including lot layout, street design, drainage design, and utility design; 1969-1972.

Research Projects

Supervised and conducted a study made by the Hawaiian Sugar Planters' Association to characterize the emissions for several bagasse-fired boilers. April-May 1976.

Supervised and conducted a study made by the Rio Grande Valley Sugar Growers, Inc. to determine the area affected by the burning of sugarcane fields prior to harvesting. November 1974-April 1975.

Supervised and conducted a study by a lightweight aggregate manufacturer to develop a material balance around the process through sampling and analysis of several parameters. November 1973.

Conducted a study in New York City to attempt to develop a correlation in the ambient air between carbon dioxide and sulfur dioxide to provide a tool for predicting air pollution episodes. January-May 1969.

Related Projects

Served as Chairman of the Engineering Foundation Conference on Stack Sampling and Source Evaluation in Santa Barbara, California, 1985.

Served as Session Chairman at the Engineering Foundation Conference on Stack Sampling and Source Evaluation in Hershey, Pennsylvania, 1984; in San Diego, California, 1993; and in Palm Coast, Florida, 1994.

JOHN D. PELLEGRINE; Project Manager

Education	B.S. in Forestry, 1985, Stephen F. Austin State University; Nacogdoches, Texas, in Forest Land Management. A.A.S. 1979, State University of New York at Morrisville; Morrisville, New York, in Business Administration.
Professional Training Courses	Two-day short course, "Performing and Observing Source Sampling," Dallas, Texas, November 1988. Attended 40-hour Occupational and Environmental Training Program on Hazardous Materials (CFR 1910.120) Dallas, Texas, May 1990. Also attended 8-hour refresher course annually. Attended Fred Pryor one-day management seminar, February 1991.
Certification	Certified Visible Emissions Evaluator
Technical Experience	Participated in the sampling of over 350 sources (six of which were trial burns), serving in the supervisory capacity on over 250 sources, including several of which were sampled simultaneously using more than one sampling train at several points in the flue gas stream. 1988-present. Over nine years experience with EPA and Texas Air Control Board (TACB) methods of sampling stationary sources. Thoroughly trained in the following EPA and TACB testing procedures: CFR, Title 40, Chapter I, Part 60, EPA Methods 1 through 17, 20, 23 through 25, and 101 through 110. Performance Specifications 1 through 5. "Sampling Procedures Manual, Texas Air Control Board, January 1982," Parts 1-1 through 8-8, 13-1 through 14-6, Appendix B through Appendix M.

PELLEGRINE

Experienced with sampling Method 0010, Method 23 (Modified Method 5 Sampling Train), Method 0030 (Volatile Organic Sampling Train), and various EPA and "Site-Specific" multiple metal and acid gas sampling trains.

Has performed on-site analysis for gravimetric particulate, sulfur trioxide, sulfur dioxide, total reduced sulfur, and hydrogen sulfide.

Experienced in the sampling of commercial calibration gas cylinders for sulfur dioxide, oxides of nitrogen, carbon dioxide, oxygen, carbon monoxide.

Thoroughly trained in the operation and routine maintenance of the following:

Thermo Environmental Model 10AR Oxides of Nitrogen Analyzer
Thermo Environmental Model 48 Carbon Monoxide Analyzer
Teledyne Model 326 Oxygen Analyzer
Ratfisch Model RS 100 Total Hydrocarbon Analyzer
Ratfisch Model RS 55 Total Hydrocarbon Analyzer
Western Research Model 721 AT Sulfur Dioxide Analyzer
Shimadzu C-R6A Gas Chromatograph
Horiba Model PIR 2000 Carbon Dioxide Analyzer
J.U.M. Model VE-7 Total Hydrocarbon Analyzer

Thoroughly trained in the calibration techniques for all field testing equipment.

BILLY L. HEFLEY; Project Supervisor II

Education	B.S. 1991, East Central University; Ada, Oklahoma, in Environmental Science with a concentration in Environmental Management.
Professional Training Course	Attended 40-hour Occupational and Environmental Training Program on Hazardous Materials (CFR 1910.120) Dallas, Texas, April 1993. Also attended an 8-hour refresher course January 1994, February 1995, and January 1996. Attended 8-hour Safe Hazardous Materials Transportation Training Program (HM-126F and HM-181) Dallas, Texas, October 1994. Attended Bill Mullins' Performing and Observing Source Sampling Short Course; Dallas, Texas, January 1995.
Certification	Certified Visible Emissions Evaluator
Technical Experience	Participated in the sampling of over 150 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1992-present. Participated in an auditing program for a permanent eight-station sulfur dioxide ambient air network in East Texas. 1992-1993. Participated in a semi-monthly ambient air monitoring survey for organic compounds at a petrochemical facility located in South Texas. 1992-1993.

HEFLEY

Thoroughly trained in all EPA testing procedures, 1991 - Present

Experienced in the analysis of commercial calibration gas cylinders for CO_2, O_2, NO_x, and SO_2.

Experienced with calibration techniques for all field testing equipment.

Thoroughly trained in the operation and routine maintenance of the following:

Thermo Environmental Model 10AR Oxides of Nitrogen Analyzer

Thermo Environmental Model 48 Carbon Monoxide Analyzer

Teledyne Model 326 Oxygen Analyzer

Western Research Model 721A Sulfur Dioxide Analyzer

Anarad Model AR880 Oxides of Nitrogen Analyzer

Anarad Model AR23 Oxygen Analyzer

Anarad Model AR30C2 Sulfur Dioxide Analyzer

Anarad Model AR50-C Carbon Dioxide Analyzer

SHANE LEE; Environmental Technician II

Education	B. S. - Environmental Science-Biology, December 20, 1997; Sul Ross State University; Alpine, Texas.
Technical Experience	Participated in the sampling of over 50 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1998-Present.

MICHAEL BASS; Environmental Technician II

Education	B. S. Geography, August 1998; Texas A&M University, College Station, Texas
Technical Experience	Participated in the sampling of over 50 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1998-Present.

SCOTT HART; Environmental Technician I

Education	Associate Degree-Environmental Science, March 1999; Texas State Technical College, Breckenridge, Texas
Technical Experience	Participated in the sampling of over 25 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA procedures, 1999-Present.