METCO ENVIRONMENTAL

APPENDIX A

Nomenclature and Equations
for
Calculation of Source Emissions

METCO ENVIRONMENTAL

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.

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

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.

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

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

$$V_s = fpm \times 0.00508 = m/sec$$

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.

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

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

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

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 – µg/dscm

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

20. Mercury – lbs/10^{12} Btu

lbs/10^{12} Btu = µg ÷ 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 9,860 dscf*/million Btu

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER:	99-182
JOB NAME:	TXU ELECTRIC
LOCATION:	FAIRFIELD, TEXAS
UNIT TESTED:	BBR UNIT NUMBER 1 BAGHOUSE INLET DUCT

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			11/09/99	11/09/99	11/10/99
BEGIN TIME			1030	1450	0805
END TIME			1300	1720	1058
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.85 (758)	29.80 (757)	29.88 (759)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.375 (9.5)	0.386 (9.8)	0.407 (10.3)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	49.131 (1.391)	50.748 (1.437)	50.634 (1.434)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	72 (22.00)	71 (22.00)	72 (22.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	48.701 (1.379)	50.315 (1.425)	50.245 (1.423)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	177.4	166.8	170.3
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	8.373 (0.237)	7.873 (0.223)	8.038 (0.228)
%M	MOISTURE IN STACK GAS BY VOLUME	%	14.67	13.53	13.79

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

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

TXU ELECTRIC
FAIRFIELD, TEXAS
BBR UNIT NUMBER 1 BAGHOUSE INLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.8533	0.8647	0.8621
CO2		%	14.6	14.6	14.2
O2		%	5.6	5.2	5.2
CO		%	0.0	0.0	0.0
N2		%	79.8	80.2	80.6
%EA	EXCESS AIR @ SAMPLING POINT	%	36.0	32.4	32.2
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.56 (30.56)	30.54 (30.54)	30.48 (30.48)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	28.72 (28.72)	28.85 (28.85)	28.76 (28.76)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	0.478 (12.1)	0.479 (12.2)	0.499 (12.7)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	362 (183)	367 (186)	365 (185)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	29.61 (752)	29.57 (751)	29.64 (753)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	2,792 (14.18)	2,800 (14.22)	2,851 (14.48)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	57,130 (36.86)	57,130 (36.86)	57,130 (36.86)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	603,050 (1,024,582)	608,329 (1,033,551)	620,510 (1,054,246)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	1,107,781 (1,882,120)	1,111,005 (1,887,597)	1,131,089 (1,921,720)

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

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

TXU ELECTRIC
FAIRFIELD, TEXAS
BBR UNIT NUMBER 1 BAGHOUSE INLET DUCT

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	150	150	150
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.200 (0.005)	0.200 (0.005)	0.200 (0.005)
%I	PERCENT ISOKINETIC	%	98.3	100.6	98.5
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:	99-182
JOB NAME:	TXU ELECTRIC
LOCATION:	FAIRFIELD, TEXAS
UNIT TESTED:	BBR UNIT NUMBER 1 STACK

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			11/09/99	11/09/99	11/10/99
BEGIN TIME			1030	1450	0805
END TIME			1353	1810	1122
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.55 (751)	29.54 (750)	29.58 (751)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.686 (17.4)	0.712 (18.1)	0.704 (17.9)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	74.421 (2.107)	75.560 (2.140)	75.205 (2.130)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	80 (27.00)	82 (28.00)	70 (21.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	72.002 (2.039)	72.814 (2.062)	74.212 (2.101)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	215.9	226.0	244.7
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	10.190 (0.289)	10.667 (0.302)	11.550 (0.327)
%M	MOISTURE IN STACK GAS BY VOLUME	%	12.40	12.78	13.47

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

SOURCE EMISSION CALCULATIONS

TXU ELECTRIC
FAIRFIELD, TEXAS
BBR UNIT NUMBER 1 STACK

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.8760	0.8722	0.8653
CO2		%	13.6	13.2	13.4
O2		%	6.0	6.8	6.4
CO		%	0.0	0.0	0.0
N2		%	80.4	80.0	80.2
%EA	EXCESS AIR @ SAMPLING POINT	%	39.2	47.2	43.1
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.42 (30.42)	30.38 (30.38)	30.40 (30.40)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	28.88 (28.88)	28.80 (28.80)	28.73 (28.73)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	1.545 (39.2)	1.559 (39.6)	1.536 (39.0)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	333 (167)	339 (171)	328 (164)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	29.45 (748)	29.44 (748)	29.53 (750)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	4,981 (25.30)	5,028 (25.54)	4,956 (25.18)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	69,454 (44.81)	69,454 (44.81)	69,454 (44.81)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	1,384,316 (2,351,953)	1,380,399 (2,345,298)	1,372,896 (2,332,550)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	2,402,583 (4,081,989)	2,425,129 (4,120,294)	2,390,269 (4,061,067)

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

SOURCE EMISSION CALCULATIONS

TXU ELECTRIC
FAIRFIELD, TEXAS
BBR UNIT NUMBER 1 STACK

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	160	160	160
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.172 (0.004)	0.172 (0.004)	0.172 (0.004)
%I	PERCENT ISOKINETIC	%	97.5	98.9	101.4
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 99-182 ✓
Job Name TXU Electric ✓
Run Number 1 ✓
Unit 1 Inlet Duct ✓
Date 11-09-99 ✓
Operator Bass / Conway / 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 79
Assumed Moisture % 16.3
Probe Length 20'
C Factor 1 to 0.25 to reference
Initial Leak @ 15.00 "Hg = 0.001 cfm
Final Leak @ 10.00 "Hg = 0.001 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
			ΔP_s			P_m	T_s						T_m	
B5	1030	675.521	0.77	0.62	0.62	4.50	359	291	252	68	69	69	241	thimble Q58
4	1035	677.67	0.45	0.36	0.36	5.00	362	283	251	67	71	69	241	filter 47Q196
3	1040	679.42	0.45	0.36	0.36	5.00	365	279	253	65	71	69	240	int. orsat
2	1045	681.05	0.40	0.32	0.32	4.50	361	272	252	62	72	70	241	CST
1	1050	682.61	0.40	0.32	0.32	4.50	358	266	252	61	70	70	241	
D5	1055	684.17	0.77	0.62	0.62	4.50	365	261	254	60	71	70	241	
4	1100	686.30	0.43	0.35	0.35	5.00	366	254	253	58	73	70	240	
3	1105	687.98	0.40	0.32	0.32	4.50	365	262	255	58	74	70	240	
2	1110	689.59	0.40	0.32	0.32	4.50	364	270	254	58	74	70	240	
1	1115	691.18	0.40	0.32	0.32	4.50	357	272	253	59	74	70	241	
F5	1120	692.78	0.55	0.44	0.44	6.00	359	272	254	59	74	71	242	
4	1125	694.84	0.40	0.32	0.32	5.00	365	271	254	58	74	71	242	
3	1130	696.54	0.40	0.32	0.32	5.00	371	270	253	58	74	71	240	
2	1135	698.14	0.38	0.31	0.31	5.00	359	269	254	58	74	71	241	
1	1140	699.73	0.38	0.31	0.31	5.00	351	268	255	58	73	71	241	1 to 0.37
H5	1145	701.38	0.75	0.90	0.90	8.00	362	266	253	58	73	71	240	
4	1150	703.91	0.47	0.56	0.56	6.50	363	245	253	56	74	71	259	
3	1155	706.11	0.38	0.31	0.31	5.00	364	246	255	56	74	71	258	

Pitot Tube Calibration Factor C_p 0.808 ✓
Volume Collected V_m 49.131 ✓ ft^3
Water Collected V_w 177.4 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s -3.20 ✓ "H_2O

Pitot Tube No. M6 ✓
Baro. Press. P_b 29.85 ✓ "Hg
Probe Tip Dia. D_n 0.200 ✓ in.
% CO_2 14.4 ✓ % CO 0.0 ✓
% O_2 5.6 ✓ % N_2 79.8 ✓
Area Stack A_s ~~54,100~~ 57,130 ✓ in^2

Barometer No. 19-1 ✓
Probe Tip No. TFE 1-7 ✓
Total Volume of Leak Checks After Start: 0.000 ft^3
V_m = Dry Gas Meter Calibration Factor 48.405 X 1.015 ✓

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

Impinger Box No. Hg 1

Impinger 1	Final Weight	~~754.2~~ 863.5	
	Initial Weight	732.5	
	Increase	131.0~~26.7~~	
Impinger 2	Final Weight	777.8	
	Initial Weight	749.9	
	Increase	27.9	
Impinger 3	Final Weight	6605	
	Initial Weight	6558	
	Increase	4.7	
Impinger 4	Final Weight	745.6	
	Initial Weight	740.6	
	Increase	5.0	
Impinger 5	Final Weight	670.2	
	Initial Weight	669.8	
	Increase	0.4	
Impinger 6	Final Weight	753.6	
	Initial Weight	753.2	
	Increase	0.4	
Impinger 7	Final Weight	728.0	
	Initial Weight	728.7	
	Increase	-0.7	

Water Weight Gain

imp 8
Fin 878.1
Int. 869.4
8.7

V_w =
g SO_2 = -
V_w =

Impinger 1	131.0
Impinger 2	27.9
Impinger 3	4.7
Impinger 4	5.0
Impinger 5	0.4
Impinger 6	0.4
Impinger 7	-0.7
impinger 8	8.7
Total	177.4 = V_w

P_b =	29.65 ✓	$\%CO_2$ =	14.6 ✓
V_m =	49.131 ✓	$\%O_2$ =	5.6 ✓
V_w =	177.4 ✓	%CO =	0.0 ✓
P_m =	0.375 ✓	$\%N_2$ =	79.8 ✓
Avg ΔP =	0.478 ✓	A_s =	~~5.9100~~ 57.30 ✓
		D_n =	0.200 ✓
Avg$\sqrt{\Delta P}$ =	0.686 ✓	T_t =	150 ✓
C_p =	0.808 ✓		
P_s =	-3.20 ✓ "H_2O		29.61 ✓ "Hg
T_m =	72 ✓ °F		532 ✓ °R
T_s =	342 ✓ °F		822 ✓ °R

Moisture Content: %M = 14.67 ✓ M_d = 0.8533 ✓ MW_d = 30.540 ✓ MW = 28.72 ✓

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 49.131 \left[\frac{29.65 + \frac{0.375}{13.6}}{72 + 460}\right] = \frac{48.701}{0.325} \text{ sft}^3 \text{ scfm} \quad ✓$$

$Vw_{gas} = 0.0472 \times Vw = 0.0472 \times 177.4 = 8.373$ ✓ sft³

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{8.373}{48.701 + 8.373} \times 100 = 14.67$ ✓ %

$V_s = 5123.8 \times 0.808 \sqrt{\frac{822}{29.61 \times 28.72}} \times 0.686 = 2792$ ✓ fpm

ACFM: ~~1,105,980~~ 1,107,781 ✓

SCFM: ~~603,050~~ 603,050 ✓

$$\%I = \frac{1{,}039 \times 48.701 \times 822}{29.61 \times 0.8533 \times 2792 \times 150 \times (0.200)^2} = 98.3\ \%$$ ✓

%EA: 34.0 ✓

Run Number 1

Unit 1 Inlet Duct

Date 11-09-99

11g

FIELD DATA

			ΔP_s			P_m	T_s					T_m		
Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
1/2	1200	707.81	0.40	0.32	0.32	5.00	362	267	253	57	74	71	261	
1	1205	709.43	0.40	0.30	0.30	4.50	357	265	254	57	74	71	260	1 to 0.24
15	1210	711.03	0.75	0.55	0.55	6.50	361	264	255	58	74	71	261	
4	1215	713.14	0.45	0.33	0.33	5.00	362	265	252	57	74	72	259	1 to 0.23
3	1220	714.80	0.38	0.28	0.28	5.00	364	263	252	58	74	72	259	" "
1/2	1225	716.35	0.40	0.25	0.25	4.50	366	263	254	58	74	72	259	1 to 0.19
1	1230	717.73	0.50	0.31	0.31	5.00	360	263	253	59	74	72	260	
15	1235	718.94	0.70	0.44	0.44	6.00	360	258	254	60	73	72	259	
4	1240	719.98	0.55	0.34	0.34	5.50	359	259	253	60	73	72	259	
3	1245	720.93	0.45	0.28	0.28	5.00	362	260	254	61	73	72	260	
2	1250	721.87	0.40	0.25	0.25	5.00	358	258	251	61	72	71	259	
1	1255	722.84	0.38	0.23	0.23	4.50	360	260	253	62	72	72	260	
END	1300	723.926	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

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 82

Assumed Moisture % 15

Probe Length 20'

C Factor 10 to 2.7 to reference

Initial Leak @ 15.00 "Hg = 0.001 cfm

Final Leak @ 9.00 "Hg = 0.001 cfm

Job Number 99.182 ✓

Job Name TXU Electric ✓

Run Number 2 ✓

Unit 1 Inlet Duct ✓

Date 11-09-99 ✓

Operator Bass/Conway/Brown/Hefley ✓

Sample Box No. Hg 3 Meter Box No. 27-2 ✓

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H2O	Orifice ΔH "H2O Desired	Orifice ΔH "H2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
		ΔPs				Pm	Ts					Tm		
LS	1450	732.05	0.82	0.72	0.72	6.00	364	290	251	68	69	69	280	Thimble
4	1455	734.33	0.55	0.48	0.48	5.00	361	287	253	68	70	69	274	QSG
3	1500	736.23	0.47	0.42	0.42	5.00	359	287	254	66	71	69	269	Filter
2	1505	738 00	0.47	0.42	0.42	5.00	364	281	254	61	72	69	264	47Q111
1	1510	739.76	0.42	0.37	0 37	5.00	361	273	252	58	73	70	262	int. orsat
US	1515	741.45	0.80	0.70	0.70	6.00	366	264	252	57	74	70	259	CST
4	1520	743.64	0.45	0.40	0.40	5.00	368	259	254	53	72	70	257	
3	1525	745.47	0.38	0.33	0.33	4.50	370	257	253	54	67	70	256	
2	1530	747.05	0.45	0.40	0.40	4.50	370	255	255	56	66	70	256	
1	1535	748 77	0.45	0.40	0.40	4.50	364	258	254	55	68	69	256	
MS	1540	750.57	0.70	0.62	0.62	6.00	368	261	255	55	69	69	258	
4	1545	752.77	0.45	0.40	0.40	5.00	367	262	254	53	71	69	258	
3	1550	754.59	0.38	0.33	0.33	4.50	370	264	256	54	71	69	258	
2	1555	756.23	0.40	0.35	0.35	5.00	366	264	255	56	71	69	256	
1	1600	757 90	0.40	0 35	0 35	5.00	361	263	254	55	72	69	256	
FS	1605	759.60	0.70	0.62	0.62	6.00	369	263	253	55	72	69	255	
4	1610	761.77	0.38	0.33	0 33	4.50	367	262	251	53	72	69	258	
3	1615	763.47	0.38	~~0.33~~ 0.31	~~0.33~~ 0.31	4.50	369	261	252	55	72	69	260	10 to 2.40

Pitot Tube Calibration Factor C_p 0.806 ✓

Volume Collected V_m 50.748 ✓ ft³

Water Collected V_w 166.0 ✓ ml

Time of Test T_t 150 ✓ min.

Stack Pressure P_s −3.10 ✓ "H_2O

Pitot Tube No. M6 ✓

Baro. Press. P_b 29.80 ✓ "Hg

Probe Tip Dia. D_n 0.200 ✓ in.

% CO_2 14.6 ✓ % CO 0.0 ✓

% O_2 5.2 ✓ % N_2 80.2 ✓

Area Stack A_s ~~59.00~~ 57,130 ✓ in²

Barometer No. 19-1 ✓

Probe Tip No. TFE1-7 ✓

Total Volume of Leak Checks After Start: 0.000 ft³ ✓

V_m = Dry Gas Meter Calibration Factor 49.998 X 1.015

[Dry Gas Meter Reading — ft³ - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg 3

			Water Weight Gain		
Impinger 1	Final Weight	858.4	Imp 8	Impinger 1	109.9
	Initial Weight	748.5	Final 825.8	Impinger 2	40.1
	Increase	109.9	Int. 817.5	Impinger 3	2.7
Impinger 2	Final Weight	785.5	8.3	Impinger 4	5.1
	Initial Weight	745.4	V_w =	Impinger 5	0.2
	Increase	40.1	g SO_2 =	Impinger 6	0.4
Impinger 3	Final Weight	760.5	V_w =	Impinger 7	0.1
	Initial Weight	757.8		Impinger 8	8.3
	Increase	2.7		Total	166.8 ✓ = V_w
Impinger 4	Final Weight	748.3			
	Initial Weight	743.2			
	Increase	5.1			
Impinger 5	Final Weight	747.5	P_b = 29.80 ✓	$\%CO_2$ = 14.6 ✓	
	Initial Weight	747.3	V_m = 50.748 ✓	$\%O_2$ = 5.2 ✓	
	Increase	0.2	V_w = 166.8 ✓	%CO = 0.0 ✓	
Impinger 6	Final Weight	750.6	P_m = 0.386 ✓	$\%N_2$ = 80.2 ✓	
	Initial Weight	750.2	Avg ΔP = 0.479 ✓	A_s = ~~5.1100~~ 57.130 ✓	
	Increase	0.4		D_n = 0.200 ✓	
			Avg $\sqrt{\Delta P}$ = 0.687 ✓	T_t = 150 ✓	
Impinger 7	Final Weight	667.2	C_p = 0.808 ✓		
	Initial Weight	667.1	P_s = -3.10 ✓ "H_2O	29.57 ✓ "Hg	
	Increase	0.1	T_m = 71 ✓ °F	531 ✓ °R	
			T_s = 367 ✓ °F	827 ✓ °R	

Moisture Content: %M = 13.53 ✓ M_d = 0.8647 ✓ MW_d = 30.544 ✓ MW = 28.85 ✓

$$Vm_{std} = 17.65\ Vm\left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 50.748\left[\frac{29.80 + \frac{0.386}{13.6}}{71 + 460}\right] = \frac{50.315}{0.335}\ \text{sft}^3\ \text{scfm}$$ ✓

$Vw_{gas} = 0.0472 \times Vw = 0.0472 \times 166.8 = 7.873$ ✓ sft^3

$$\%\ \text{Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{7.873}{50.315 + 7.873} \times 100 = 13.53\ \%$$ ✓

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{827}{29.57 \times 28.85}} \times 0.687 = 2,800\ \text{fpm}$$ ✓

ACFM: ~~1149316~~ 1,111,005 / 608,329 ✓

SCFM: ~~629,306~~

$$\%I = \frac{1,039 \times 50.315 \times 827}{29.57 \times 0.8647 \times 2,800 \times 150 \times (0.200)^2} = 100.6\ \%$$ ✓

%EA: 32.4 ✓

Run Number 2

Unit 1 Baghouse Inlet Duct

Date 11-04-94

Hg FIELD DATA

			ΔP_s			P_m	T_s					T_m		
Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
F2	1620	705.06	0.38	0.30	0.30	4.50	371	262	253	56	72	70	262	
1	1625	706.62	0.38	0.30	0.30	4.50	366	260	252	56	72	70	259	
DS	1630	768.22	0.70	0.56	0.56	6.00	370	260	252	56	72	70	255	
4	1635	770.34	0.45	0.32	0.32	4.50	369	259	254	53	73	70	255	10 to 2.20
3	1640	771.83	0.38	0.24	0.24	4.00	366	260	256	56	73	70	258	10 to 1.40
2	1645	772.45	0.40	0.25	0.25	4.00	371	261	254	59	72	70	255	
1	1650	773.87	0.38	0.24	0.24	4.00	368	256	254	60	72	70	261	
BS	1655	774.89	0.62	0.39	0.39	5.00	371	258	252	60	72	71	259	
4	1700	776.29	0.48	0.30	0.30	4.50	372	264	254	59	72	71	255	
3	1705	777.45	0.38	0.24	0.24	4.50	365	267	253	59	72	71	261	
2	1710	778 94	0.40	0.25	0.25	4.50	368	269	253	57	72	71	257	
1	1715	780.49	0 38	0.24	0.24	4.50	368	265	255	57	72	71	258	
END	1720	782.003	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-182 ✓
Job Name TXU Electric ✓
Run Number 3 ✓
Unit BBR Unit 1 Baghouse Inlet duct ✓
Date 11-10-99 ✓
Operator Bass / Conway / Brown / Hafley
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 62
Assumed Moisture % 15
Probe Length 20'
C Factor 1.0 to 2.55 to reference
Initial Leak @ 15.00 "Hg = 0.001 cfm
Final Leak @ 7.00 "Hg = 0.001 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	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 (T_m)	Heated Line °F	Remarks
BS	0805	808.122	0.78	0.65	0.65	6.50	361	251	250	53	68	64	266	thimble
4	0810	810.24	0.50	0.42	0.42	5.00	352	252	251	52	68	67	259	filter 47a114
3	0815	812.08	0.45	0.38	0.38	5.00	355	267	252	50	69	67	257	int orsat
2	0820	813.78	0.38	0.31	0.31	4.50	364	267	251	50	69	67	257	CST
1	0825	815.33	0.38	0.31	0.31	4.50	365	261	253	50	70	68	258	
DS	0830	816.86	0.80	0.66	0.66	6.50	369	256	254	50	70	68	258	
~~END~~	0831	816.926	—	—	—	—	—	—	—	—	—	—	—	lost power
~~END~~ BS	0854	816.926	0.80	0.66	0.66	6.50	368	251	250	50	69	68	250	
4	0858	818.67	0.55	0.46	0.46	5.50	367	252	251	48	70	69	251	
3	0903	820.49	0.38	0.31	0.31	4.50	362	253	252	48	70	69	250	
2	0908	822.04	0.38	0.31	0.31	4.50	364	253	252	50	70	69	257	
1	0913	823.59	0.38	0.31	0.31	4.50	364	271	253	50	71	69	259	
FS	0918	825.18	0.73	0.60	0.60	6.50	370	279	254	50	72	69	259	
4	0923	827.24	0.45	0.38	0.38	5.00	368	274	253	47	73	69	260	
3	0928	829.01	0.38	0.31	0.31	5.00	364	259	253	48	73	69	255	
2	0933	830.62	0.40	0.33	0.33	5.00	366	261	255	49	73	70	260	
1	0938	832.27	0.38	0.31	0.31	5.00	365	262	252	50	74	70	258	
HS	0943	833.87	0.70	0.58	0.58	6.50	369	262	253	50	74	70	260	

Pitot Tube Calibration Factor C_p 0.808 ✓
Volume Collected V_m 50.634 ✓ ft^3
Water Collected V_w 170.3 ✓ ml
Time of Test T_t 150 ✓ min.
Stack Pressure P_s -3.30 ✓ "H_2O

Pitot Tube No. M6 ✓
Baro. Press. P_b 29.88 ✓ "Hg
Probe Tip Dia. D_n 0.200 ✓ in.
% CO_2 14.2 ✓ % CO 0.0 ✓
% O_2 5.2 ✓ % N_2 80.6 ✓
Area Stack A_s ~~57100~~ 57130 ✓ in^2

Barometer No. 19-1 ✓
Probe Tip No. TFE 1-7 ✓
Total Volume of Leak Checks After Start: — ft^3 ✓
V_m = Dry Gas Meter Calibration Factor 49.886 X 1.015

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

Impinger Box No. Hg 1

Impinger 1	Final Weight	880.9
	Initial Weight	737.3
	Increase	143.6
Impinger 2	Final Weight	766.0
	Initial Weight	754.0
	Increase	12.0
Impinger 3	Final Weight	664.9
	Initial Weight	663.4
	Increase	1.5
Impinger 4	Final Weight	751.5
	Initial Weight	747.2
	Increase	4.3
Impinger 5	Final Weight	678.4
	Initial Weight	678.4
	Increase	0.0
Impinger 6	Final Weight	767.4
	Initial Weight	767.3
	Increase	0.1
Impinger 7	Final Weight	731.9
	Initial Weight	732.5
	Increase	-0.6

Water Weight Gain

Imp. 8
Final 887.4
Ini 878.0
Inc. 9.4

V_w =
g SO_2 = -
V_w =

Impinger 1	143.6 ~~12.0~~ MB
Impinger 2	12.0
Impinger 3	1.5
Impinger 4	4.3
Impinger 5	0.0
Impinger 6	0.1
Impinger 7	-0.6
Impinger 8	9.4
Total	170.3 = V_w

P_b =	29.88	$\%CO_2$ =	14.2
V_m =	50.634	$\%O_2$ =	5.2
V_w =	170.3	%CO =	0.0
P_m =	0.407	$\%N_2$ =	80.6
Avg ΔP =	0.499	A_s =	~~59100~~ 57130
		D_n =	0.200
Avg$\sqrt{\Delta P}$ =	~~0.6~~ 0.700	T_t =	150
C_p =	0.808		
P_s =	-3.30 "H_2O		29.64 "Hg
T_m =	72 °F		532 °R
T_s =	365 °F		825 °R

Moisture Content: %M = 13.79 M_d = 0.8621 MW_d = 30.480 MW = 28.76

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 50.634 \left[\frac{29.88 + \frac{0.407}{13.6}}{72 + 460}\right] = \frac{50.245\ sft^3}{0.335\ scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 170.3 = 8.038 sft^3

$$\%\ Moisture = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{8.038}{50.245 + 8.038} \times 100 = 13.79\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{825}{29.64 \times 28.76}} \times 0.700 = 2851\ fpm$$

$$\%I = \frac{1{,}039 \times 50.245 \times 825}{29.64 \times 0.8621 \times 2851 \times 150 \times (0.200)^2} = 98.5\ \%$$

ACFM: 1,131,089

SCFM: 620,~~051~~ 510

%EA: 32.2

Run Number 2 — Hg — FIELD DATA

Unit BBR Unit 1 Baghouse Inlet Duct

Date 11-10-99

			ΔP_s			P_m	T_s					T_m		
Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
H4	0948	836.03	0.45	0.38	0.38	5.50	367	263	251	48	75	71	258	
3	0953	837.84	0.38	0.30	0.30	5.00	364	265	253	51	75	71	263	ID to 2.50
2	0958	839.42	0.38	0.30	0.30	5.00	366	266	254	52	75	71	264	
1	1003	840.97	0.40	0.32	0.32	5.00	365	266	253	53	75	72	263	
LS	1008	842.58	0.75	0.60	0.60	~~6.00~~ 6.50 Hg	367	265	254	53	75	72	261	
4	1013	844.71	0.45	0.36	0.36	5.50	364	264	253	51	76	72	259	
3	1018	846.44	0.40	0.32	0.32	5.00	365	263	255	54	76	73	267	
2	1023	847.93	0.40	0.32	0.32	5.00	367	262	254	57	77	73	261	
1	1028	849.32	~~0.45~~ 0.35	0.36	0.36	5.50	364	261	254	58	76	73	259	
LS	1033	850.64	0.75	0.60	0.60	6.50	366	259	253	59	76	74	250	
4	1038	852.78	0.55	0.44	0.44	5.50	362	258	255	52	77	74	254	
3	1043	854.43	0.40	0.32	0.32	5.00	362	257	252	55	78	74	263	
2	1048	855.54	0.45	0.36	0.36	5.50	365	258	253	60	77	75	262	
1	1053	856.59	0.45	0.36	0.36	5.50	364	258	252	61	77	75	259	
END	1058	858.008	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-182 ✓
Job Name TXU ✓
Run Number ~~8~~ 1 ✓
Unit BBR 1 Stack ✓
Date 11-9-99 ✓
Operator Lee/Hart/Hefley ✓
Sample Box No. Hg 2 Meter Box No. 29-1 ✓

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 68
Assumed Moisture % 15%
Probe Length 12'
C Factor 1.10 ⇒ 2.50 to reference
Initial Leak @ 16.0 "Hg = 0.000 cfm
Final Leak @ 14.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	P_m Orifice ΔH "H_2O Actual	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
D 1	1030	209.413	1.40	0.62	0.62	6.0	327	289	291	66	71	74	273	Filter 47Q105
1	1035	211.59	1.40	0.62	0.62	6.0	332	287	293	64	71	74	276	Multi-Point
2	1040	213.78	1.50	0.67	0.67	6.0	331	294	295	61	73	73	281	Dual Orsat
2	1045	216.07	1.50	0.67	0.67	6.0	331	295	292	60	77	73	285	
3	1050	218.36	1.55	0.69	0.69	6.5	332	296	287	60	79	74	287	
3	1055	220.68	1.55	0.69	0.69	6.5	332	291	281	61	79	75	288	
~~End~~ 4	1100	223.04	~~1.60~~	~~0.71~~	~~0.71~~	~~6.5~~	~~333~~	~~290~~	~~282~~	~~61~~	~~78~~	~~76~~	~~285~~	
4	1105	225.42	1.60	0.71	0.71	6.5	333	288	282	62	77	76	286	
End	1110	227.813	—	—	—	—	—	—	—	—	—	—	—	leak√to 227.933; 10.020.000
C 1	1128	228.078	1.40	0.62	0.62	5.5	327	262	273	67	77	79	284	leak√to 228.078; 10.020.000
1	1133	230.28	1.45	0.65	0.65	5.5	332	261	274	58	72	79	285	0.265
2	1138	232.52	1.55	0.69	0.69	6.0	333	268	273	54	69	79	283	
2	1143	234.83	1.55	0.69	0.69	6.0	333	273	273	51	70	78	285	
3	1148	237.16	1.60	0.71	0.71	6.0	333	278	272	50	73	79	285	
3	1153	239.53	1.60	0.71	0.71	6.0	334	283	273	50	75	79	286	
4	1158	241.88	1.65	0.73	0.73	6.5	334	287	273	49	77	79	285	
4	1203	244.29	1.65	0.73	0.73	6.5	334	290	275	49	78	79	284	
End	1208	246.677	—	—	—	—	—	—	—	—	—	—	—	leak√to 246.838; 10.020.000

Pitot Tube Calibration Factor C_p 0.810 ✓
Volume Collected V_m 74.421 ft³
Water Collected V_w 215.9 ml
Time of Test T_t 160 min.
Stack Pressure P_s -1.30 "H_2O

Pitot Tube No. M-8 ✓
Baro. Press. P_b 29.55 "Hg
Probe Tip Dia. D_n 0.172 ✓ in.
% CO_2 13.6 % CO 0
% O_2 6.0 % N_2 80.4
Area Stack A_s 69,454 ✓ in²

Barometer No. 19-1 ✓
Probe Tip No. TFE 2-6a ✓
Total Volume of Leak Checks After Start: 0.916 ✓ ft³
V_m = Dry Gas Meter Calibration Factor 1.000 X 74.421

[Dry Gas Meter Reading — ft³ - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg a

Impinger 1	Final Weight	885.6
	Initial Weight	748.2
	Increase	137.4
Impinger 2	Final Weight	792.1
	Initial Weight	748.0
	Increase	44.1
Impinger 3	Final Weight	757.6
	Initial Weight	745.9
	Increase	11.7
Impinger 4	Final Weight	662.6
	Initial Weight	655.0
	Increase	7.6
Impinger 5	Final Weight	747.2
	Initial Weight	745.0
	Increase	2.2
Impinger 6	Final Weight	746.1
	Initial Weight	746.5
	Increase	-0.4
Impinger 7	Final Weight	761.0
	Initial Weight	760.95
	Increase	0.5

Water Weight Gain

Imp 8 Final 948.3
Initial 935.5
12.8

Impinger 1	137.4
Impinger 2	44.1
Impinger 3	11.7
Impinger 4	7.6
Impinger 5	2.2
Impinger 6	-0.4
Impinger 7	0.5
impinger 8	12.8
Total	215.9 = V_w

V_w =
g SO_2 = -
V_w =

P_b =	29.55	%CO_2 =	13.6
V_m =	74.421	%O_2 =	6.0
V_w =	215.9	%CO =	0
P_m =	0.686	%N_2 =	80.4
Avg ΔP =	1.545	A_s =	69.454
		D_n =	0.172
Avg$\sqrt{\Delta P}$ =	1.243	T_t =	160
C_p =	0.810		
P_s =	-1.30	"H_2O	29.45 "Hg
T_m =	80	°F	540 °R
T_s =	333	°F	793 °R

Moisture Content: %M = 12.40 M_d = 0.8760 MW_d = 30.416 MW = 28.88

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 74.421 \left[\frac{29.55 + \frac{0.686}{13.6}}{80 + 460}\right] = \frac{72.002}{0.450}\ \text{sft}^3/\text{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 215.9 = 10.190 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{10.190}{72.002 + 10.190} \times 100 = 12.40$ %

V_s = 5123.8 x 0.810 $\sqrt{\frac{793}{29.45 \times 28.88}}$ x 1.243 = 4981 fpm

ACFM: 2402583

SCFM: 1384316

%I = $\frac{1{,}039 \times 72.002 \times 793}{160 \times 0.8760 \times 29.45 \times 4981 \times (0.172)^2}$ = 97.5 %

%EA: 39.2

Run Number 1

Unit BBR 1 Stack

Date 11-9-99

Hg FIELD DATA

			ΔP_s			P_m	T_s				T_m			
Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line	Remarks
B1	1222	247.016	1.45	0.65	0.65	6.0	332	275	278	52	78	80	283	leak Vto 247.016; 10.000 cc
1	1227	249.27	1.45	0.65	0.65	6.0	335	282	272	53	77	80	284	0.339
2	1232	251.54	1.50	0.66	0.66	6.0	335	284	270	52	81	79	286	
2	1237	253.78	1.50	0.66	0.66	6.0	335	286	271	52	82	78	285	
3	1242	256.04	1.55	0.69	0.69	6.5	334	288	269	52	85	79	287	"
3	1247	258.57	1.55	0.69	0.69	6.5	335	292	274	53	89	80	288	
4	1252	260.65	1.60	0.71	0.71	7.0	335	293	275	53	89	80	288	
4	1259	263.00	1.60	0.71	0.71	7.0	335	294	274	53	88	80	286	
End	1302	265.618	—	—	—	—	—	—	—	—	—	—	—	leak Vto 265.965; 10.000 cc
A1	1313	265.930	1.45	0.65	0.65	7.0	334	280	281	59	85	82	283	leak Vto 265.930; 10.000 cc
1	1318	268.21	1.50	0.66	0.66	7.0	334	287	279	58	89	82	283	0.312
2	1323	270.49	1.60	0.71	0.71	6.5	335	289	282	57	92	82	285	
2	1328	272.87	1.60	0.71	0.71	6.5	335	291	284	57	92	83	285	
3	1333	275.25	1.60	0.71	0.71	6.5	336	293	286	57	90	83	287	
3	1338	277.59	1.65	0.73	0.73	6.5	336	291	284	58	89	84	286	
4	1343	279.97	1.65	0.73	0.73	6.5	336	290	283	59	88	84	285	
4	1348	282.38	1.65	0.73	0.73	6.5	336	290	284	59	88	84	284	
End	1353	284.750	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-182 ✓
Job Name TXU ✓
Run Number 2 ✓
Unit BBR 1 Stack ✓
Date 11-9-99 ✓
Operator Lee/Hart/Hefley ✓
Sample Box No. Hg 4 Meter Box No. 29-1 ✓

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 76
Assumed Moisture % 15%
Probe Length 12'
C Factor 1.10 ⇒ 2.50 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 15.0 "Hg = 0.002 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual	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 (T_m)	Heated Line	Remarks
A1	1450	286.745	1.45	0.65	0.65	5.5	337	250	282	59	88	85	278	Filter:
1	1455	289.08	1.45	0.65	0.65	5.5	338	261	280	57	86	86	281	47Q110
2	1500	291.36	1.50	0.68	0.68	5.5	338	263	281	53	86	86	282	
2	1505	293.69	1.55	0.69	0.69	5.5	338	270	283	52	84	86	284	
3	1510	296.03	1.60	0.71	0.71	5.5	338	272	276	52	82	86	285	
3	1515	298.64	1.60	0.71	0.71	5.5	338	275	274	52	84	85	287	ΔH = 1.13
4	1520	300.72	1.60	0.73	0.73	6.0	338	277	271	52	84	85	287	
4	1525	303.15	1.60	0.73	0.73	6.0	338	280	270	52	83	85	286	
End	1530	305.605	—	—	—	—	—	—	—	—	—	—	—	Leak √ to 305.749, 16.0 0.000
B1	1539	305.918	1.40	0.65	0.65	5.5	335	274	287	57	89	84	284	Leak √ to 305.918, 16.0 0.000
1	1544	308.24	1.45	0.65	0.65	5.5	338	276	288	56	87	84	283	0.313
2	1549	310.53	1.50	0.69	0.69	5.5	338	283	286	54	87	83	281	
2	1554	312.98	1.50	0.69	0.69	5.5	337	286	285	54	86	83	282	
3	1559	315.22	1.55	0.72	0.72	6.0	339	289	286	54	85	83	284	
3	1604	317.61	1.60	0.73	0.73	6.0	338	288	287	55	88	82	285	
4	1609	319.99	1.60	0.73	0.73	6.0	339	289	282	55	90	82	285	
4	1614	322.39	1.60	0.73	0.73	6.0	338	291	277	55	90	81	285	
End	1619	324.969	—	—	—	—	—	—	—	—	—	—	—	Leak √ to 325.149, 13.0 0.000

Pitot Tube Calibration Factor C_p 0.810 ✓
Volume Collected V_m 75.560 ✓ ft³
Water Collected V_w 226.0 ✓ ml
Time of Test T_t 160 ✓ min.
Stack Pressure P_s -1.20 ✓ "H₂O

Pitot Tube No. M-8 ✓
Baro. Press. P_b 29.54 ✓ "Hg
Probe Tip Dia. D_n 0.172 ✓ in.
% CO_2 13.2 ✓ % CO 0 ✓
% O_2 6.8 ✓ % N_2 80.0 ✓
Area Stack A_s 69.454 ✓ in²

Barometer No. 19-1 ✓ Probe Tip No. TFE 2-6a ✓
Total Volume of Leak Checks After Start: 0.972 ✓ ft³
V_m = Dry Gas Meter Calibration Factor 1.000 ✓ X 75.560

[Dry Gas Meter Reading — ft³ - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg 4

Impinger 1	Final Weight	900.2	
	Initial Weight	754.0	
	Increase	146.2	
Impinger 2	Final Weight	705.3	
	Initial Weight	648.8	
	Increase	56.5	
Impinger 3	Final Weight	657.7	
	Initial Weight	654.2	
	Increase	3.5	
Impinger 4	Final Weight	683.5	
	Initial Weight	676.6	
	Increase	6.9	
Impinger 5	Final Weight	750.8	
	Initial Weight	751.1	
	Increase	-0.3	
Impinger 6	Final Weight	753.0	
	Initial Weight	752.3	
	Increase	0.7	
Impinger 7	Final Weight	737.3	
	Initial Weight	737.6	
	Increase	-0.3	
		-0	

Water Weight Gain

Imp 8
Final 818.2
Int. 805.4
12.8

V_w =
g SO_2 = .
V_w =

Impinger 1	146.2
Impinger 2	56.5
Impinger 3	3.5
Impinger 4	6.9
Impinger 5	-0.3
Impinger 6	0.7
Impinger 7	-0.3
Imp 8	12.8
Total	226.0 = V_w

P_b =	29.54	%CO_2 =	13.2
V_m =	75.560	%O_2 =	6.8
V_w =	226.0	%CO =	0
P_m =	0.712	%N_2 =	80.0
Avg ΔP =	1.559	A_s =	69.454
		D_n =	0.172
Avg$\sqrt{\Delta P}$ =	1.248	T_t =	160
C_p =	0.810		
P_s =	-1.30 "H_2O		29.44 "Hg
T_m =	82 °F		542 °R
T_s =	339 °F		799 °R

Moisture Content: %M = 12.78 M_d = 0.8722 MW_d = 30.384 MW = 28.80

$$Vm_{std} = 17.65\ Vm\left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 75.560\left[\frac{29.54 + \frac{0.712}{13.6}}{82 + 460}\right] = \begin{matrix} 72.814 \text{ sft}^3 \\ 0.455 \text{ scfm} \end{matrix}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 226.0 = 10.667 sft³

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{10.667}{72.814 + 10.667} \times 100$ = 12.78 %

V_s = 5123.8 x 0.810 $\sqrt{\frac{799}{29.44 \times 28.80}}$ x 1.248 = 5028 fpm

ACFM: 2,425,129

%I = $\frac{1{,}039 \times 72.814 \times 799}{160 \times 0.8722 \times 29.44 \times 5028 \times (0.172)^2}$ = 98.9 %

SCFM: 1,380,399

%EA: 47.2

Run Number 2

Unit BBR 1 Stack

Date 11-9-99

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	P_m Orifice ΔH "H_2O Actual	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
C1	1638	325.306	1.45	0.67	0.67	5.5	336	270	290	63	87	80	283	leak√to 325.306; 10.000.000
1	1643	327.61	1.50	0.69	0.69	6.0	338	280	292	57	87	80	285	0.337
2	1648	329.98	1.55	0.71	0.71	6.5	339	283	295	49	88	80	286	
2	1653	332.32	1.60	0.73	0.73	6.5	339	286	293	47	86	79	285	
3	1658	334.75	1.60	0.73	0.73	6.5	339	288	292	46	85	79	285	
3	1703	337.17	1.65	0.76	0.76	6.5	339	290	293	45	83	79	286	
4	1708	339.61	1.65	0.76	0.76	6.5	340	290	290	45	83	79	285	
4	1713	342.04	1.65	0.76	0.76	6.5	340	290	289	45	83	78	285	
End	1718	344.424	—	—	—	—	—	—	—	—	—	—	—	leak√to 344.595; 10.000.000
D1	1730	344.746	1.50	0.69	0.69	6.0	339	276	273	46	76	77	287	leak√to 344.746; 10.000.002
1	1735	347.13	1.50	0.69	0.69	6.0	340	275	271	45	75	77	288	0.325
2	1740	349.28	1.60	0.73	0.73	6.0	340	273	271	44	75	76	286	
2	1745	351.62	1.60	0.73	0.73	6.0	340	274	274	44	75	76	286	
3	1750	353.97	1.60	0.73	0.73	6.0	340	268	270	44	76	75	285	
3	1755	356.33	1.60	0.73	0.73	6.0	340	268	264	45	75	75	285	
4	1800	358.59	1.65	0.76	0.76	6.0	340	269	265	46	75	74	283	
4	1805	361.06	1.65	0.76	0.76	6.0	340	269	267	46	74	73	281	
End	1810	363.277	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-182 ✓
Job Name TXU ✓
Run Number 3 ✓
Unit BBR 1 Stack ✓
Date 11-10-99 ✓
Operator Lee/Hart/Hefley ✓
Sample Box No. Hg 2 Meter Box No. 29-1 ✓

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 53
Assumed Moisture % 12%
Probe Length 12
C Factor 1.0 ⇒ 2.20 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 15.0 "Hg = 0.000 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	Dry Gas Temp. °F Outlet (T_m)	Heated Line	Remarks
D1	0805	371.189	1.45	0.67	0.67	5.5	320	278	294	52	61	56	257	Filter 47Q112
1	0810	373.51	1.50	0.69	0.69	5.5	322	287	291	46	61	56	262	Multi Point
2	0815	375.80	1.50	0.69	0.69	5.5	323	290	292	46	63	57	263	Into Orsat
2	0820	378.09	1.50	0.69	0.69	5.5	323	291	293	45	64	57	267	
3	0825	380.38	1.60	0.73	0.73	6.0	324	290	289	45	64	57	268	
3	0830	382.97	1.60	0.73	0.73	6.0	324	289	288	46	65	57	268	
4	0835	385.07	1.65	0.76	0.76	6.0	325	290	286	47	66	58	267	
4	0840	387.48	1.60	0.73	0.73	6.0	325	291	286	47	66	58	268	
End	0845	389.915	—	—	—	—	—	—	—	—	—	—	—	leak ✓ to 390.035; 10.000
C1	0857	390.183	1.45	0.67	0.67	5.5	322	269	282	53	68	59	271	leak ✓ to 390.183; 10.000
1	0902	392.32	1.50	0.69	0.69	6.0	326	275	282	48	67	60	272	0.268
2	0907	394.66	1.50	0.69	0.69	6.0	326	278	284	48	67	60	272	
2	0912	397.00	1.55	0.71	0.71	6.0	327	281	281	48	67	60	275	
3	0917	399.33	1.60	0.73	0.73	6.0	327	283	282	49	67	60	276	
3	0922	401.71	1.60	0.73	0.73	6.0	328	284	283	49	68	61	275	
4	0927	404.09	1.60	0.73	0.73	6.0	328	288	283	49	69	61	277	
4	0932	406.47	1.60	0.73	0.73	6.0	328	290	283	50	68	61	276	
End	0937	408.798	—	—	—	—	—	—	—	—	—	—	—	leak ✓ to 408.764; 10.000

Pitot Tube Calibration Factor C_p 0.810 ✓
Volume Collected V_m 75.205 ✓ ft^3
Water Collected V_w 244.7 ✓ ml
Time of Test T_t 160 ✓ min.
Stack Pressure P_s −0.70 ✓ "H_2O

Pitot Tube No. M-8 ✓
Baro. Press. P_b 29.58 ✓ "Hg
Probe Tip Dia. D_n 0.172 ✓ in.
% CO_2 13.4 ✓ % CO 0 ✓
% O_2 6.4 ✓ % N_2 80.2 ✓
Area Stack A_s 69.454 ✓ in^2

Barometer No. 19-1 ✓
Probe Tip No. TFE 2-6a ✓
Total Volume of Leak Checks After Start: 0.853 ✓ ft^3
V_m = Dry Gas Meter Calibration Factor 1.000 ✓ X 75.205

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

Impinger Box No. Hg 2

Impinger 1	Final Weight	886.3
	Initial Weight	745.8
	Increase	140.5
Impinger 2	Final Weight	831.2
	Initial Weight	754.4
	Increase	76.8
Impinger 3	Final Weight	758.5
	Initial Weight	753.6
	Increase	4.9
Impinger 4	Final Weight	666.2
	Initial Weight	659.3
	Increase	6.9
Impinger 5	Final Weight	756.2
	Initial Weight	755.7
	Increase	0.5
Impinger 6	Final Weight	758.0
	Initial Weight	758.1
	Increase	-0.1
Impinger 7	Final Weight	765.0
	Initial Weight	765.0
	Increase	0

Water Weight Gain

Imp. 8
final 963.8
init 948.6
15.2

V_w =
g SO_2 = .
V_w =

Impinger 1	140.5
Impinger 2	76.8
Impinger 3	4.9
Impinger 4	6.9
Impinger 5	0.5
Impinger 6	-0.1
Impinger 7	0
Imp. 8	15.2
Total	~~466.9~~ 244.7 = V_w

P_b =	29.58 ✓	$\%CO_2$ =	13.4 ✓
V_m =	75.205 ✓	$\%O_2$ =	6.4 ✓
V_w =	244.7 ✓	%CO =	0 ✓
P_m =	0.704 ✓	$\%N_2$ =	80.2 ✓
Avg ΔP =	~~1.559~~ 1.536 ✓	A_s =	69.454 ✓
		D_n =	0.172 ✓
Avg $\sqrt{\Delta P}$ =	~~1.248~~ 1.239 ✓	T_t =	160 ✓
C_p =	0.810 ✓		
P_s =	-0.70 ✓ $"H_2O$		29.53 ✓ "Hg
T_m =	70 ✓ °F		530 ✓ °R
T_s =	328 ✓ °F		788 ✓ °R

Moisture Content: %M = 13.49 ✓ M_d = 0.8653 ✓ MW_d = 30.400 ✓ MW = 28.73 ✓

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 75.205 \left[\frac{29.58 + \frac{+0.704}{13.6}}{70 + 460}\right] = \frac{74.212}{0.464}\ \begin{matrix}\text{sft}^3 \\ \text{scfm}\end{matrix}$$ ✓

Vw_{gas} = 0.0472 x Vw = 0.0472 x 244.7 = 11.550 ✓ sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{11.550}{74.212 + 11.550}$ x 100 = 13.49 ✓ %

V_s = 5123.8 x 0.810 $\sqrt{\frac{788}{29.53 \times 28.73}}$ x ~~1.248~~ 1.239 = ~~4992~~ 4956 ✓ fpm

2,390,269 ✓

ACFM: ~~2407632~~ 1,372 ✓

SCFM: ~~1382869~~

%EA: 43.1 ✓

$$\%I = \frac{1{,}039 \times 74.212 \times 788}{160 \times 0.8653 \times 29.53 \times 4992 \times (0.172)^2} = \frac{101.4}{4956} = \text{~~100.6~~}\ \%$$ ✓

Run Number 3

Unit BBR 1 Stack

Date 11-10-99

MS FIELD DATA

			ΔP_s			P_m	T_s					T_m		
Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line	Remarks
B1	0952	409.117	1.50	0.69	0.69	6.0	327	271	287	57	73	64	277	leak rate 409.117, 10 cfm 0.000
1	0957	411.41	1.45	0.67	0.67	6.0	329	275	285	52	75	65	279	0.319
2	1002	413.62	1.55	0.71	0.71	6.0	331	277	285	53	78	66	278	
2	1007	415.96	1.60	0.73	0.73	6.0	331	278	284	52	80	67	278	
3	1012	418.34	1.60	0.73	0.73	6.0	331	279	285	53	81	69	279	
3	1017	420.73	1.60	0.73	0.73	6.0	331	282	285	53	82	69	277	
4	1022	423.11	1.65	0.76	0.76	6.5	331	285	286	54	85	71	276	
4	1027	425.58	1.60	0.73	0.73	6.5	331	284	288	54	86	71	274	
End	1032	428.059	—	—	—	—	—	—	—	—	—	—	—	leak rate 428.201; 10 cfm 0.000
A1	1042	428.325	1.40	0.64	0.64	7.0	330	275	288	62	84	76	277	leak rate 428.325, 10 cfm 0.000
1	1047	430.49	1.40	0.64	0.64	7.0	332	277	286	60	85	77	277	0.266
2	1052	432.95	1.50	0.69	0.69	7.0	332	276	287	56	86	78	276	
2	1057	435.32	1.50	0.69	0.69	7.0	332	282	286	50	87	78	276	
3	1102	437.68	1.50	0.69	0.69	7.0	332	285	288	50	87	79	274	
3	1107	440.04	1.50	0.69	0.69	7.0	332	287	289	49	89	79	275	
4	1112	442.41	1.50	0.69	0.69	7.0	333	287	286	50	89	79	277	
4	1117	444.74	1.50	0.69	0.69	7.0	333	286	286	50	90	79	276	
End	1122	447.247	—	—	—	—	—	—	—	—	—	—	—	

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-182

Job Name TXU Electric (BBSES)

Sampling Location Unit 1 Inlet Duct

Date 11-09-99 Time 0823

Stack Height ~~89~~ ft.

Sampling Port Height Above Ground 60 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)					
Port & Wall Thickness (in.)					30" ✓
Inside Stack Diameter (in.)					

Sampling Ports are 68 ✓ ft. 1 ✓ in.

(3.48 ✓ stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 16 ft. 9 in.

(0.86 ✓ stack diameters) upstream from disturbance (outlet, constriction, bend, expansion)

Dc = ~~237.827~~ 234.620 ✓

Point Number	Percent Diameter	Distance from Ref. Point (decimal in.)	Distance from Ref. Point (fractional in.)	Port A/B ΔP/T$_s$/α	Port B/D ΔP/T$_s$/α	Port C/F ΔP/T$_s$/α	Port D/H ΔP/T$_s$/α
1		19.750 ✓	19 3/4 ✓	0.40 / 362 / 8	0.25 / 324 / 40	0.25 / 324 / 15	0.30 / 330 / 15
2		59.125 ✓	59 1/8 ✓	0.60 / 384 / 10	0.40 / 373 / 45	0.39 / 334 / 10	0.50 / 340 / 12
3		98.500 ✓	98 1/2 ✓	0.75 / 371 / 8	0.60 / 291 / 89	0.55 / 332 / 20	0.30 / 338 / 6
4		137.875 ✓	137 7/8 ✓	0.85 / 368 / 0	0.70 / 360 / 0	0.65 / 390 / 0	0.75 / 360 / 0
5		177.250 ✓	177 1/4 ✓	0.90 / 388 / -10	0.75 / 365 / -10	0.55 / 330 / -8	0.75 / 287 / -10
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
10		6 x 5 Matrix		/ J /	/ L /	/ /	/ /
11				0.40 / 360 / 10	0.45 / 354 / 10	/ /	/ /
12				0.55 / 378 / 10	0.60 / 371 / 10	/ /	/ /
13				0.65 / 341 / 10	0.65 / 378 / 12	/ /	/ /
14				0.75 / 369 / 0	0.80 / 370 / 0	/ /	/ /
15				0.50 / 340 / -10	0.60 / 365 / 10	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M6 ✓

C_p = 0.809 ✓

P_b = 29.86 "Hg

P_s = -2.6 "H_2O 29.67 ✓ "Hg

A_s = ~~59,700~~ in.^{2}

Average ΔP 0.588 ✓

Average $\Delta P^{1/2}$ 0.758 ✓

Average T_s 353 ✓ °F

Average α ~~10.6~~ 9.9 ✓ degrees

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-182
Job Name TXU
Sampling Location BBR 1 Stack
Date 11-9-99 Time

Stack Height 400 ft.
Sampling Port Height Above Ground 263.5 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)					348 3/8 ✓
Port & Wall Thickness (in.)					51 1/2 ✓
Inside Stack Diameter (in.)					297 3/8 ✓

297.375

Sampling Ports are 220 ✓ ft. 9 5/8 ✓ in. (8.91 ✓ stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 136 ✓ ft. 6 ✓ in. (5.51 ✓ stack diameters) upstream from disturbance (outlet, 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	3.2 ✓	9.516 ✓	9 1/2 ✓	1.501319 1 ✓	1.501320 2	1.501318 1	1.451314 3
2	10.5 ✓	31.224 ✓	31 1/4 ✓	1.651323 1 - 2	1.651322 1	1.651324 1	1.601321 1
3	19.4 ✓	57.691 ✓	57 11/16 ✓	1.651326 1	1.601323 1	1.651323 - 1	1.651323 1
4	32.3 ✓	96.052 ✓	96 1/16 ✓	1.651325 1	1.651326 1	1.601324 - 4	1.601324 1
5				/ /	/ /	/ /	/ /
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
10				/ /	/ /	/ /	/ /
11	* calculated as half of an 8-point			/ /	/ /	/ /	/ /
12	traverse			/ /	/ /	/ /	/ /
13				/ /	/ /	/ /	/ /
14				/ /	/ /	/ /	/ /
15				/ /	/ /	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M-8 ✓
C_p = 0.810 ✓
P_b = 29.63 "Hg 29.48 ✓
P_s = −2.0 "H_2O ~~29.50~~ "Hg
A_s = 69,454 ✓ in.²

Average ΔP 1.591 ✓
Average $\Delta P^{1/2}$ 1.261 ✓
Average T_s 322 ✓ °F
Average α 1.00 ✓ degrees

METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-182 Sample Location: BBR Unit 1 Baghouse Inlet Duct

Job Name: TXU Analytical Method: 3B

Location: Fairfield, TX Sample Type: Single point or Multi point; Grab or Integrated

Date: 11-9-99 Leak Check: Time: 4:00 (min. 4 minutes) Rate: 0.000

Operator: Hefley Ambient Air Check:

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

Run Number 1 Run Time 1030 - 1300	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	14.6	14.6	14.6	14.6
O_2 - % Vol.	5.6	5.6	5.6	5.6
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	79.8	79.8	79.8	79.8

Fo = 1.048

Run Number 2 Run Time 1450 - 1720	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	14.6	14.6	14.6	14.6
O_2 - % Vol.	5.2	5.2	5.2	5.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

Fo = 1.075

Run Number 3 Run Time 0805 - 1058	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	14.2	14.2	14.2	14.2
O_2 - % Vol.	5.2	5.2	5.2	5.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.6	80.6	80.6	80.6

Fo = 1.100

METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-182 Sample Location: BBR Unit 1 Stack

Job Name: TXU Analytical Method: 3B

Location: Fairfield, TX Sample Type: Single point or Multi point, Grab or Integrated

Date: 11-9-99 Leak Check: Time: 4:00 (min. 4 minutes) Rate: 0.000

Operator: Hefley Ambient Air Check:

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

Run Number 1 Run Time 1030-1353	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.6	13.5	13.6	13.6
O_2 - % Vol.	6.0	6.0	6.0	6.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.5	80.4	80.4

Fo = 1.096

Run Number 2 Run Time 1450-1810	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.2	13.2	13.2	13.2
O_2 - % Vol.	6.8	6.8	6.8	6.8
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.0	80.0	80.0	80.0

Fo = 1.064

Run Number 3 Run Time 0805-1122	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.4	13.4	13.4	13.4
O_2 - % Vol.	6.4	6.4	6.4	6.4
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

Fo = 1.082

METCO ENVIRONMENTAL

APPENDIX C

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-6	0.808	10/04/99
Pitot Tube #M-8	0.810	10/04/99
Probe Tip #TFE-1-7	0.200	10/04/99
Probe Tip #TFE-2-6a	0.172	10/11/99
Dry Gas Meter #27-2	1.015	11/07/99
Stack Unit Orifice #27-2		11/08/99
Digital Temperature Indicator #27-2		11/07/99
Dry Gas Meter #29-1	1.000	10/04/99
Stack Unit Orifice #29-1		10/05/99
Digital Temperature Indicator #29-1		10/04/99
Barometer #19-1		10/04/99

METCO ENVIRONMENTAL

APPENDIX C

Post Test

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-6	0.807	11/19/99
Pitot Tube #M-8	0.810	11/22/99
Probe Tip #TFE-1-7	0.199	11/19/99
Probe Tip #TFE-2-6a	0.172	11/19/99
Dry Gas Meter #27-2	1.008	01/10/00
Stack Unit Orifice #27-2		01/14/00
Digital Temperature Indicator #27-2		01/10/00
Dry Gas Meter #29-1	1.000	11/22/99
Stack Unit Orifice #29-1		11/22/99
Digital Temperature Indicator #29-1		11/22/99
Barometer #19-1		11/22/99

PITOT TUBE CALIBRATION

Date: 10-4-99 Time: 1400

Pitot No.: M6 T_s: 72 °F

Pitot Dimensions: 3/8" hps 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 Brown 274

Checked By: Jason Conway #273

PITOT TUBE CALIBRATION

Date: 10-4-99

Time: 1450

Pitot No.: M18

T_s: 72 °F

Pitot Dimensions: 3/8" hyps

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	0.51	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							0.810			0.810

Summary of Results:

Normal high side calibration factor 0.810

variation + 1.36%

variation - 0.25%

Normal low side calibration factor 0.810

variation + 1.36%

variation - 0.25%

Calibrator: Jason Brown 274

Checked By: Jason Cowley # 273

METCO ENVIRONMENTAL

✓ HM107

NOZZLE CALIBRATION

Nozzle Set No. TFE-1

Date 10-4-99 Calibrator: Jason Brown 374

	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 ✓					

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE-2

Date 10-11-99 Calibrator: Shane Lee

	1 6a	2	3	4	5	6
Reading 1	0.173					
Reading 2	0.169					
Reading 3	0.173					
Reading 4	0.173					
Reading 5	0.170					
Reading 6	0.173					
Reading 7	0.173					
Reading 8	0.173					
Reading 9	0.169					
Reading 10	0.169					
Average	0.172					

	7	8	9	10	11	12
Reading 1						
Reading 2						
Reading 3						
Reading 4						
Reading 5						
Reading 6						
Reading 7						
Reading 8						
Reading 9						
Reading 10						
Average						

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. Bass

Checked By: Pam Brown

C_{DG} @ 2 liters/min. = —

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 @ 0.5 in 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	1310	5.015 cf	74 °F	-0.90 "H_2O	572.057 cf	77 °F	76 °F	0.50 "H_2O
Start	1257	0.000 cf	74 °F	-0.90 "H_2O	567.114 cf	76 °F	75 °F	0.50 "H_2O
Avg.	13	5.015 cf	74 °F	-0.900 "H_2O	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)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1323	5.122 cf	74 °F	-1.30 "H_2O	577.407 cf	78 °F	77 °F	1.00 "H_2O
Start	1314	0.000 cf	74 °F	-1.30 "H_2O	572.377 cf	77 °F	76 °F	1.00 "H_2O
Avg.	9	5.122 cf	74 °F	-1.300 "H_2O	5.030 cf	77 °F		1.000 "H_2O

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

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

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

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 @ 1.5" 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	1324	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

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

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

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

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)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1356	10.300 cf	74 °F	-2.50 "H_2O	598.026 cf	86 °F	78 °F	2.00 "H_2O
Start	1344	0.000 cf	74 °F	-2.50 "H_2O	587.902 cf	81 °F	77 °F	2.00 "H_2O
Avg.	12	10.300 cf ✓	74 °F ✓	-2.500 "H_2O ✓	10.124 cf ✓	81 °F ✓		2.000 "H_2O ✓

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

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

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

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2 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 @ 3.0" 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	1409	10.330 cf	74 °F	-2.90 "H_2O	608.602 cf	89 °F	79 °F	3.00 "H_2O
Start	1358	0.000 cf	74 °F	-2.90 "H_2O	598.364 cf	85 °F	78 °F	3.00 "H_2O
Avg.	10	10.330 cf ✓	74 °F ✓	-2.900 "H_2O ✓	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. 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 @ 4.0" H_2O P_b: 29.32 "Hg

Control Module Vacuum: 3.00 "Hg

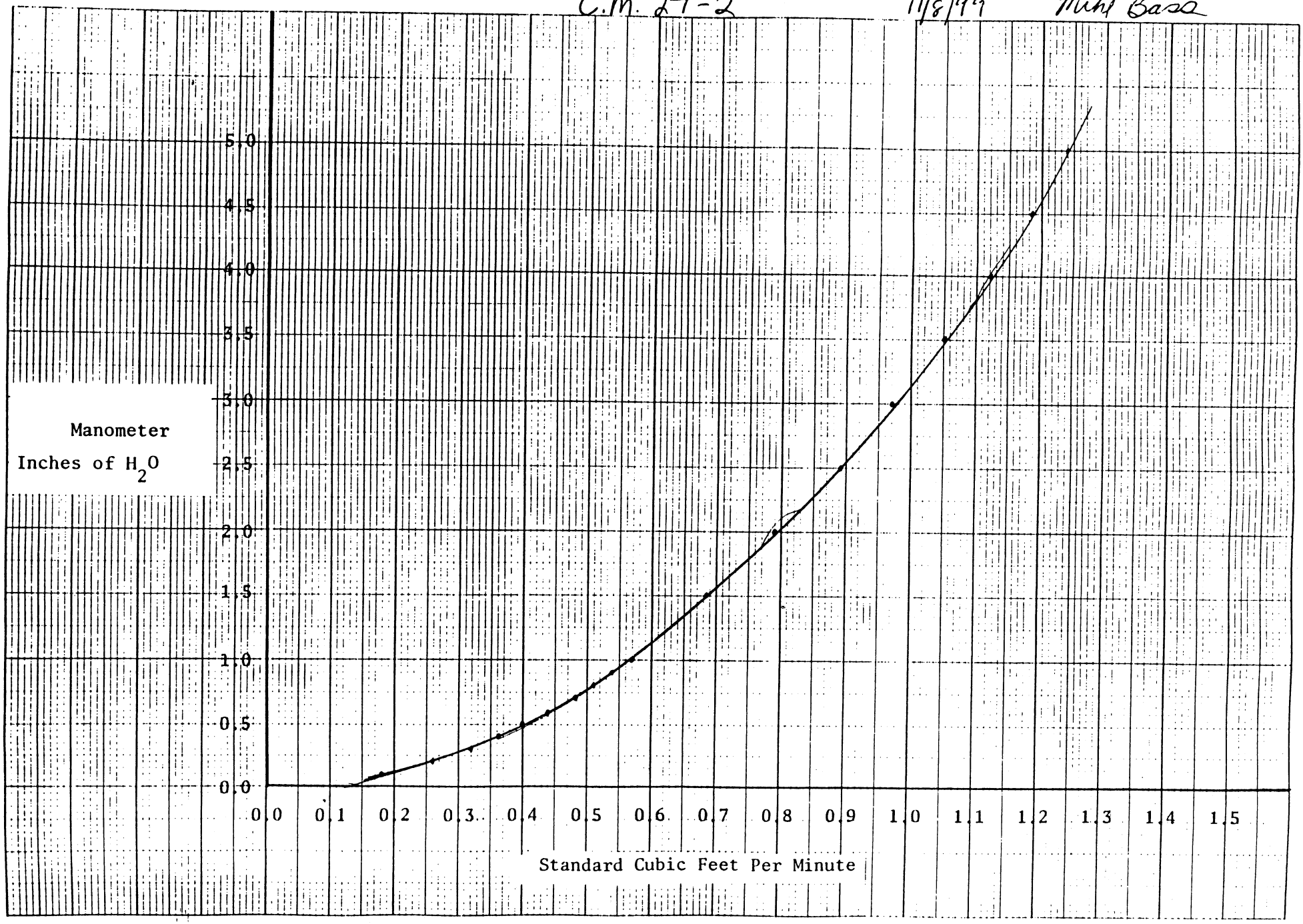
	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1419	10.130 cf	74 °F	-3.70 "H_2O	619.031 cf	91 °F	80 °F	4.00 "H_2O
Start	1410	0.000 cf	74 °F	-3.70 "H_2O	608.926 cf	87 °F	79 °F	4.00 "H_2O
Avg.	9	10.130 cf ✓	74 °F ✓	-3.700 "H_2O ✓	10.105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

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.130 \left[\frac{29.32 + \frac{-3.700}{13.6}}{74 + 460}\right] \times 1.000 \quad (C_f) = 9.726 \text{ dcsf} \checkmark$$

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

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

C.M. 27-2 11/8/99 Mike Basa



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: John Brown

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 10-21-99

ΔH ("H_2O)	C_{DG}
0.5	1.000
1.0	1.001
1.5	0.999
2.0	0.995
3.0	0.998
4.0	1.009
Average	1.000

Variation: + 0.90%

- 0.50%

Calibrator: Shane Lee 261

Checked By: Bill Lyles #107

C_{DG} @ 2 liters/min. = 1.017

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 10-4-99

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: 29.28 "Hg

Control Module Vacuum: 50 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	1423	5.380	cf	75	°F	-1.10	"H_2O
Start	1409	0.000	cf	75	°F	-1.10	"H_2O
Avg.	14	5.380	cf	75	°F	-1.10	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
End	377.116	cf	75	°F	73	°F	0.50	"H_2O
Start	371.767	cf	74	°F	72	°F	0.50	"H_2O
Avg.	5.349	cf	74		°F		0.50	"H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 5.380 \left[\frac{29.28 + \frac{-1.10}{13.6}}{75 + 460}\right] \times 1.000\ (C_i) = \cancel{5.192}\ 5.183\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 5.349 \left[\frac{29.28 + \frac{0.50}{13.6}}{74 + 460}\right] = 5.183\ dcsf$$

$$C_{DG} = \frac{\cancel{5.192}\ 5.183}{5.183} = \boxed{\cancel{1.002}\ 1.000}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 10-4-99

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: 29.28 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1436	5.400 cf	75 °F	-1.60 "H_2O
Start	1426	0.000 cf	75 °F	-1.60 "H_2O
Avg.	10	5.400 cf	75 °F	-1.60 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
	383.463 cf	75 °F	73 °F	1.00 "H_2O
	378.114 cf	76 °F	73 °F	1.00 "H_2O
	5.349 cf	74 °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.400 \left[\frac{29.28 + \frac{-1.60}{13.6}}{75 + 460} \right] \times 1.000\ (C_f) = 5.195 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.349 \left[\frac{29.28 + \frac{1.00}{13.6}}{74 + 460} \right] = 5.190 \text{ dcsf}$$

$$C_{DG} = \frac{5.195}{5.190} = \boxed{1.001}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Shane Lee

Date: 10-4-99

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

Run No.: 1 @ 1.5 "H2O

P_b: 29.28 "Hg

Control Module Vacuum: 5 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1454	10.668 cf	75 °F	-2.10 "H_2O	394.790 cf	73 °F	74 °F	1.50 "H_2O
Start	1438	0.000 cf	75 °F	-1.90 "H_2O	384.223 cf	72 °F	73 °F	1.50 "H_2O
Avg.	16	10.668 cf	75 °F	-2.00 "H_2O	10.567 cf		74 °F	1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.668 \left[\frac{29.28 + \frac{-2.00}{13.6}}{75 + 460} \right] \times 1.000 \ (C_f) = 10.253 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.567 \left[\frac{29.28 + \frac{1.50}{13.6}}{74 + 460} \right] = 10.265 \text{ dcsf}$$

$$C_{DG} = \frac{10.253}{10.265} = \boxed{0.999} \ \checkmark$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Shane Lee

Date: 10-4-99

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

Run No.: 1 @ 2.0" H_2O

P_b: 29.28 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	1510	11.395	cf	75	°F	-2.40	"H_2O
Start	1456	0.000	cf	75	°F	-2.40	"H_2O
Avg.	14	11.395	cf	75	°F	-2.40	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
	406.546	cf	70	°F	76	°F	2.00	"H_2O
	395.246	cf	75	°F	75	°F	2.00	"H_2O
	11.300	cf	74	°F			2.00	"H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 11.395 \left[\frac{29.28 + \frac{-2.40}{13.6}}{75 + 460}\right] \times 1.000\ (C_f) = 10.941\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 11.300 \left[\frac{29.28 + \frac{2.00}{13.6}}{74 + 460}\right] = 10.991\ dcsf$$

$$C_{DG} = \frac{10.941}{10.991} = \boxed{0.995}\ \checkmark$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 10-4-99

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 "H2O

P_b: 29.28 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1524	10.800 cf	75 °F	-3.00 "H_2O
Start	1513	0.000 cf	75 °F	-3.00 "H_2O
Avg.	11	10.800 cf	75 °F	-3.00 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	417.690 cf	67 °F	77 °F	3.00 "H_2O
Start	409.045 cf	75 °F	76 °F	3.00 "H_2O
Avg.	10.645 cf	74 °F		3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.800 \left[\frac{29.28 + \frac{-3.00}{13.6}}{75 + 460}\right] \times 1.000 \ (C_f) = 10.354 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.645 \left[\frac{29.28 + \frac{3.00}{13.6}}{74 + 460}\right] = \frac{10.380}{\cancel{10.360}} \text{ dcsf}$$

$$C_{DG} = \frac{10.354}{\cancel{10.360}\ 10.380} = \boxed{\cancel{0.999}\ 0.998}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Shane Lee

Date: 10-4-99

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

Run No.: 1 @ 4.0" H2O

P_b: 29.28 "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	1547	10.947 cf	75 °F	-4.00 "H_2O	430.335 cf	68 °F	77 °F	4.00 "H_2O
Start	1537	0.000 cf	75 °F	-3.80 "H_2O	419.698 cf	78 °F	77 °F	4.00 "H_2O
Avg.	10	10.947 cf	75 °F	-3.90 "H_2O	10.637 cf	75 °F		4.00 "H_2O

$$Vm_{std} = 17.65 \times 10.947 \left[\frac{29.28 + \frac{-3.90}{13.6}}{75 + 460}\right] \times 1.000\ (C_f) = 10.471 \text{ dcsf}$$

$$Vm_{std} = 17.65 \times 10.637 \left[\frac{29.28 + \frac{4.00}{13.6}}{75 + 460}\right] = 10.378 \text{ dcsf}$$

$$C_{DG} = \frac{10.471}{10.378} = \boxed{1.009}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 10-4-99

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: 29.28 "Hg

Control Module Vacuum: 50 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1622	2.210 cf	75 °F	-0.20 "H_2O
Start	1606	0.000 cf	75 °F	-0.20 "H_2O
Avg.	16	2.210 cf	75 °F	-0.20 "H_2O

Dry Gas Meter

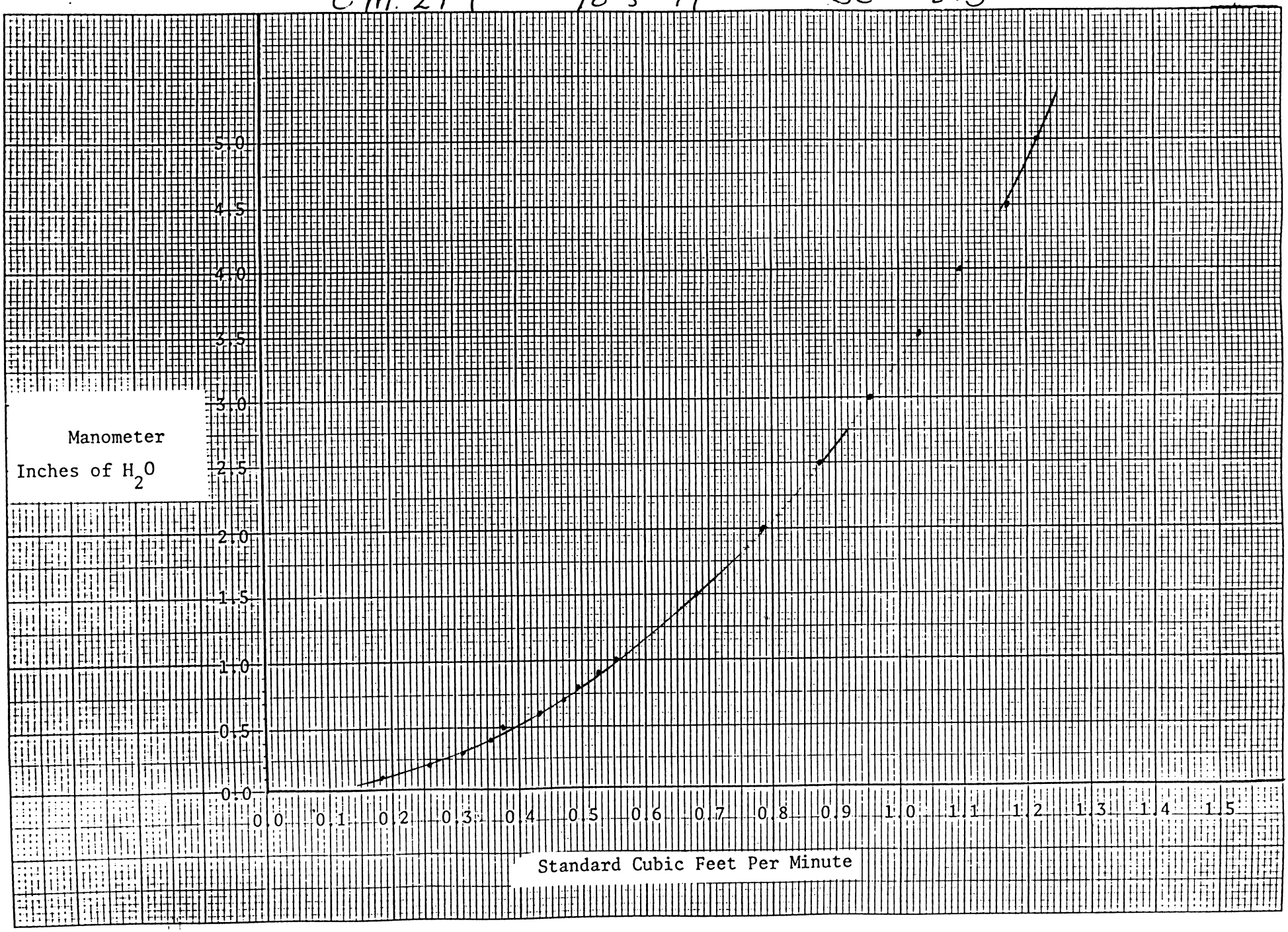
	Meter Reading	Temp. In	Temp. Out	P_m
End	432.153 cf	81 °F	76 °F	0.01 "H_2O
Start	430.968 cf	78 °F	76 °F	0.01 "H_2O
Avg.	2.185 cf	78 °F		0.01 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.210 \left[\frac{29.28 + \frac{-0.20}{13.6}}{75 + 460} \right] \times 1.000\ (C_f) = 2.134 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.185 \left[\frac{29.28 + \frac{0.01}{13.6}}{78 + 460} \right] = 2.099 \text{ dcsf}$$

$$C_{DG} = \frac{2.134}{2.099} = \boxed{1.017}\ \checkmark$$

CM-29-1 10-5-99 JC # 273



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 10-4-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1330	70	70
Ice Bath	1337	32	32
Boiling Water	1345	212	212
Oven	1353	250	250
Oven	1355	300	301
Oven	1358	350	350
Oven	1359	375	376

Meter Adjusted? Yes _____ No ✓

Calibrator: Shane Lee #261

Checked By: Bill Hyfantis #101

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

PITOT TUBE CALIBRATION

Date: 11-19-99 Time: 1400

Pitot No.: m6 T_s: 68 °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	0.34	0.583	0.796	0.34	0.583	0.796
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							0.807			0.807

Summary of Results:

Normal high side calibration factor 0.807

variation + 0.12 %

variation - 1.36 %

Normal low side calibration factor 0.807

variation + 0.12 %

variation - 1.36 %

Calibrator: Scott Hart #268

Checked By: Mike Bass

PITOT TUBE CALIBRATION

Date: 11-22-99 Time: 0925

Pitot No.: m8 T_s: 70 °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 ✓	0.51 ✓	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							0.810 ✓			0.810 ✓

Summary of Results:

Normal high side calibration factor 0.810 ✓

variation + 1.36% ✓

variation - 0.25% ✓

Normal low side calibration factor 0.810 ✓

variation + 1.36% ✓

variation - 0.25% ✓

Calibrator: SCOH Hart #268

Checked By: Jason Comins #273

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE-1

Date 11-19-99 Calibrator: Shane Lee 261

	4	6	7	8	10	12
Reading 1	0.117	0.175	0.200	0.234	0.309	0.362
Reading 2	0.116	0.174	0.200	0.232	0.308	0.360
Reading 3	0.118	0.173	0.198	0.236	0.308	0.359
Reading 4	0.118	0.173	0.196	0.235	0.307	0.363
Reading 5	0.120	0.174	0.199	0.235	0.308	0.362
Reading 6	0.119	0.173	0.200	0.235	0.306	0.359
Reading 7	0.117	0.173	0.199	0.234	0.306	0.360
Reading 8	0.116	0.174	0.199	0.236	0.308	0.359
Reading 9	0.117	0.175	0.200	0.235	0.308	0.361
Reading 10	0.118	0.175	0.200	0.236	0.306	0.360
Average	0.118 ✓	0.174 ✓	0.199 ✓	0.235 ✓	0.307 ✓	0.361 ✓

	14	—	—	—	—	—
Reading 1	0.429					
Reading 2	0.429					
Reading 3	0.430					
Reading 4	0.429					
Reading 5	0.431					
Reading 6	0.428					
Reading 7	0.429					
Reading 8	0.429					
Reading 9	0.431					
Reading 10	0.430					
Average	0.430 ✓					

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE-2

Date 11-19-99 Calibrator: Mike Bass

	4	6a	7	8	10	12
Reading 1	0.116	0.174	0.193	0.235	0.309	0.363
Reading 2	0.115	0.170	0.195	0.232	0.309	0.362
Reading 3	0.114	0.170	0.195	0.232	0.310	0.363
Reading 4	0.114	0.172	0.194	0.234	0.309	0.363
Reading 5	0.115	0.174	0.197	0.235	0.308	0.361
Reading 6	0.115	0.173	0.196	0.235	0.309	0.361
Reading 7	0.115	0.172	0.197	0.235	0.311	0.362
Reading 8	0.114	0.174	0.195	0.234	0.310	0.362
Reading 9	0.116	0.171	0.196	0.234	0.309	0.363
Reading 10	0.115	0.172	0.195	0.233	0.309	0.363
Average	0.115	0.172	0.195	0.234	0.309	0.362

	14					
Reading 1	0.435	—	—	—	—	—
Reading 2	0.433					
Reading 3	0.434					
Reading 4	0.435					
Reading 5	0.433					
Reading 6	0.434					
Reading 7	0.433					
Reading 8	0.432					
Reading 9	0.433					
Reading 10	0.432					
Average	0.433					

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 1-10-00

ΔH ("H_2O)	C_{DG}
0.5	1.003 ✓
1.0	1.002 ✓
1.5	1.014 ✓
2.0	1.015 ✓
3.0	1.011 ✓
4.0	1.005 ✓
Average	1.008 ✓

Variation: + 0.69% ✓

- 0.60% ✓

Calibrator: Jason Brown 274

Checked By: Jason Conway #273

C_{DG} @ 2 liters/min. = 1.059

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 01-10-00

Calibrator: JASON BROWN Z74

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

Run No.: 1 @ 0.5 "H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1520	5.0 cf	70 °F	-0.8 "H_2O
Start	1508	0.0 cf	70 °F	-0.6 "H_2O
Avg.	12✓	5.0✓ cf	70✓ °F	-0.7✓ "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	107.484 cf	78 °F	77 °F	0.5 "H_2O
Start	102.449 cf	77 °F	76 °F	0.5 "H_2O
Avg.	5.035✓ cf	77✓ °F		0.5 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.0 \left[\frac{29.25 + \frac{-0.7}{13.6}}{70 + 460}\right] \times 1.000\,(C_i) = 4.862\text{✓ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.035 \left[\frac{29.25 + \frac{0.5}{13.6}}{77 + 460}\right] = 4.847\text{✓ dcsf}$$

$$C_{DG} = \frac{4.862}{4.847} = \boxed{1.003\text{✓}}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Jason Brown

Date: 1-10-00

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

Run No.: 1 @ 1.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.50 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1532	5.0 cf	70 °F	-1.4 "H_2O	112.714 cf	80 °F	78 °F	1.00 "H_2O
Start	1523	0.0 cf	70 °F	-1.3 "H_2O	107.676 cf	78 °F	77 °F	1.00 "H_2O
Avg.	9	5.0 ✓ cf	70 °F	-1.35 ✓ "H_2O	5.038 ✓ cf	78 ✓ °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.0 \left[\frac{29.25 + \frac{-1.35}{13.6}}{70 + 460}\right] \times 1.000(C_p) = 4.854 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.038 \left[\frac{29.25 + \frac{1.00}{13.6}}{78 + 460}\right] = 4.847 \text{ dcsf}$$

$$C_{DG} = \frac{4.854}{4.847} = \boxed{1.002}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2
Date: 01-10-00

Calibrator: Jason Brown

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

Run No.: 1 @ 1.50

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1613	10.0 cf	70 °F	-1.80 "H_2O
Start	1557	0.0 cf	70 °F	-1.80 "H_2O
Avg.	16✓	10.0✓ cf	70✓ °F	-1.80 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
	135.128 cf	85 °F	80 °F	1.50 "H_2O
	125.130 cf	82 °F	79 °F	1.50 "H_2O
	9.998✓ cf	82✓ °F		1.50✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.00 \left[\frac{29.25 + \frac{-1.80}{13.6}}{70 + 460}\right] \times 1.000\ (C_p) = 9.697\text{✓ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.998\text{✓} \left[\frac{29.25 + \frac{1.50}{13.6}}{82 + 460}\right] = 9.559\text{✓ dcsf}$$

$$C_{DG} = \frac{9.697}{9.559} = \boxed{1.014\text{✓}}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 1-10-00

Calibrator: Jason Brown

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

Run No.: 1 @ 2.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1628	10.0 cf	70 °F	-2.3 "H_2O	145.335 cf	88 °F	83 °F	2.00 "H_2O
Start	1614	0.0 cf	70 °F	-2.4 "H_2O	135.310 cf	86 °F	81 °F	2.00 "H_2O
Avg.	14	10.0 cf	70 °F	-2.35 "H_2O	10.025 cf	85 °F		2.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.0 \left[\frac{29.25 + \frac{-2.35}{13.6}}{70 + 460}\right] \times 1.000\ (C_f) = 9.683 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.025 \left[\frac{29.25 + \frac{2.00}{13.6}}{85 + 460}\right] = 9.544 \text{ dcsf}$$

$$C_{DG} = \frac{9.683}{9.544} = \boxed{1.015}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2 Calibrator: Jason Brown

Date: 1-10-00

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

Run No.: 1 @ 3.00" H_2O P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1640	10.0 cf	70 °F	-3.10 "H_2O	155.984 cf	90 °F	83 °F	3.00 "H_2O
Start	1629	0.0 cf	70 °F	-3.10 "H_2O	145.950 cf	88 °F	82 °F	3.00 "H_2O
Avg.	11 ✓	10.0 ✓ cf	70 ✓ °F	-3.10 ✓ "H_2O	10.034 ✓ cf	86 ✓ °F		3.00 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times \frac{10.0}{\cancel{29.25}} \left[\frac{29.25 + \frac{-3.10}{13.6}}{70 + 460} \right] \times 1.000\ (C_f) = 9.665\ \text{dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.034 \left[\frac{29.25 + \frac{3.00}{13.6}}{86 + 460} \right] = 9.559\ \text{dcsf}$$

$$C_{DG} = \frac{9.665}{9.559} = \boxed{1.011}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Jason Brown

Date: 1-10-00

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

Run No.: 1 @ 4.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1651	10.0 cf	70 °F	-4.00 "H_2O	166.410 cf	93 °F	84 °F	4.00 "H_2O
Start	1641	0.0 cf	70 °F	-4.10 "H_2O	156.330 cf	91 °F	83 °F	4.00 "H_2O
Avg.	10 ✓	10.0 ✓ cf	70 ✓ °F	-4.05 ✓ "H_2O	10.080 ✓ cf	88 ✓ °F		4.00 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.0 \left[\frac{29.25 + \frac{-4.05}{13.6}}{70 + 460}\right] \times 1.000\,(C_p) = 9.642 \text{ ✓ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.080 \left[\frac{29.25 + \frac{4.00}{13.6}}{88 + 460}\right] = 9.592 \text{ ✓ dcsf}$$

$$C_{DG} = \frac{9.642}{9.592} = \boxed{1.005 \text{ ✓}}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Jason Conway #273

Date: 1-14-00

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

Run No.: 1 @ 2L/min

P_b: 30.50 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 1)

	Time	Meter Reading	Temp.	P_m
End	1530	2.093 cf	68 °F	-0.7 "H_2O
Start	1500	0.000 cf	68 °F	-0.7 "H_2O
Avg.	30	2.093 cf	68 °F	-0.7 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	255.920 cf	78 °F	76 °F	0.01 "H_2O
Start	253.905 cf	75 °F	75 °F	0.01 "H_2O
Avg.	2.015 cf	76 °F		0.01 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.093 \left[\frac{30.50 + \frac{-0.7}{13.6}}{68 + 460} \right] \times 1.006\,(C_f) = 2.143 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.015 \left[\frac{30.50 + \frac{0.01}{13.6}}{76 + 460} \right] = 2.024 \text{ dcsf}$$

$$C_{DG} = \frac{2.143}{2.024} = \boxed{1.059}$$

METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

(NEW)

Date: 01-10-00

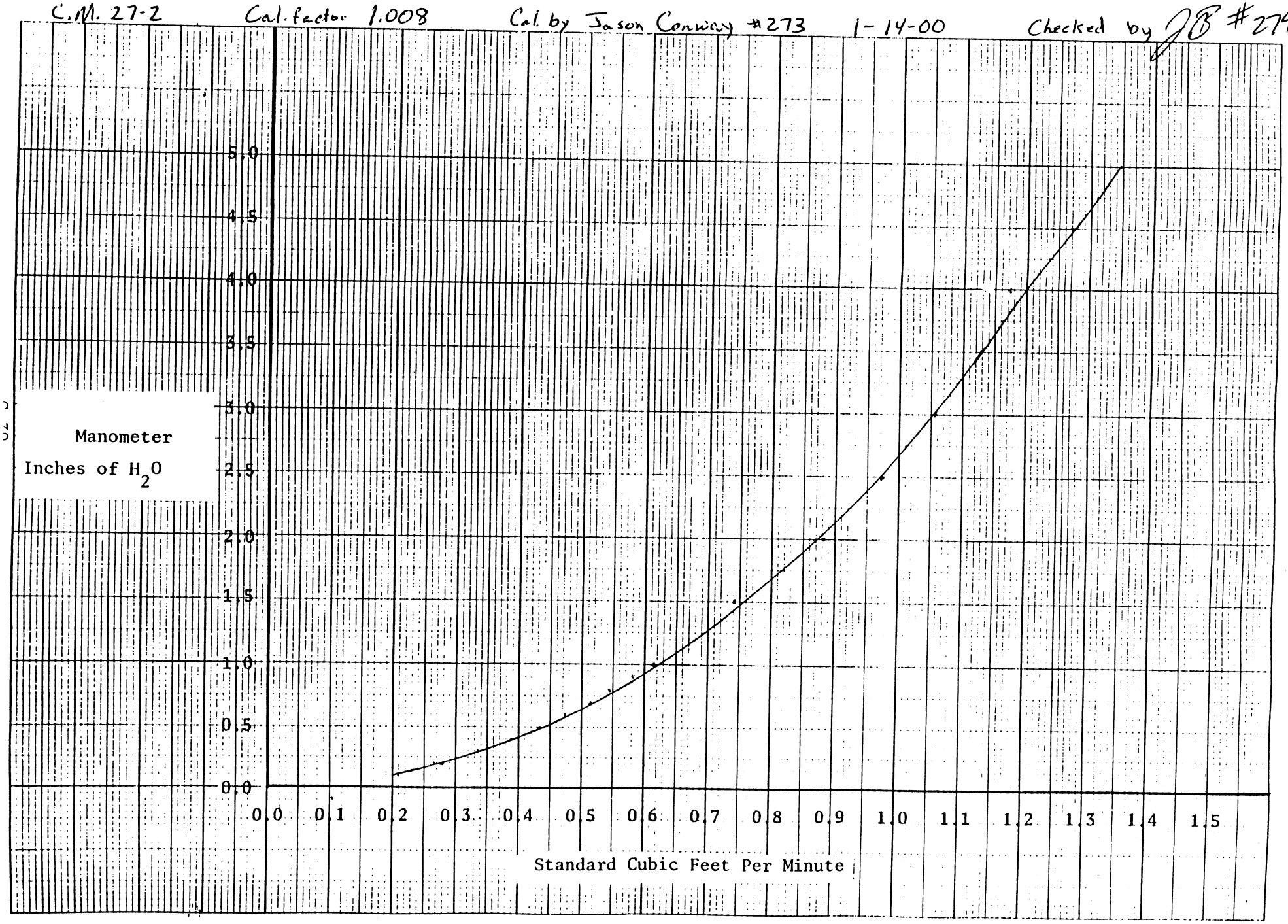
Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1425	72	75
Ice Bath	1428	37	40
Boiling Water	1434	212	214
Oven	1440	251	254
Oven	1445	300	298
Oven	1449	350	346
Oven	1454	376	371

Meter Adjusted? Yes _____ No ✓

Calibrator: JASON BROWN 274

Checked By: Jason Cowin #273

C.M. 27-2 Cal. factor 1.008 Cal by Jason Conway #273 1-14-00 Checked by JB #274



METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 11-22-99

ΔH ("H_2O)	C_{DG}
0.5	1.005 ✓
1.0	0.999 ✓
1.5	1.003 ✓
2.0	1.000 ✓
3.0	0.994 ✓
4.0	0.999 ✓
Average	1.000 ✓

Variation: + 0.5% ✓

- 0.6% ✓

Calibrator: Jason Conway #273

Checked By: Scott Hart #268

C_{DG} @ 2 liters/min. = 1.013

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

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

Run No.: 1 @ 0.50 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading		Temp.		P_m	
End	0935	5.003	cf	69	°F	-0.8	"H_2O
Start	0922	0.000	cf	69	°F	-0.8	"H_2O
Avg.	13 ✓	5.0031 ✓	cf	69 ✓	°F	-0.8 ✓	"H_2O

Dry Gas Meter

	Meter Reading		Temp. In		Temp. Out		P_m	
	738522	cf	87	°F	71	°F	0.5	"H_2O
	733.505	cf	72	°F	71	°F	0.5	"H_2O
	5.017 ✓	cf	75 ✓		°F	✓	0.5	"H_2O

$$Vm_{std} = 17.65 \times 5.003 \left[\frac{29.24 + \frac{-0.8}{13.6}}{69 + 460} \right] \times 1.000 \quad (C_f) = 4.871 \text{ dcsf}$$

$$Vm_{std} = 17.65 \times 5.017 \left[\frac{29.24 + \frac{0.5}{13.6}}{75 + 460} \right] = 4.846 \text{ dcsf}$$

$$C_{DG} = \frac{4.871}{4.846} = \boxed{1.005}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

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

Run No.: 1 @ 1.00" H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1031	5.004 cf	69 °F	-13 "H_2O	744.777 cf	68 °F	71 °F	1.0 "H_2O
Start	1021	0.000 cf	69 °F	-13 "H_2O	739.786 cf	70 °F	71 °F	1.0 "H_2O
Avg.	10 ✓	5.004 ✓ cf	69 ✓ °F	-13 ✓ "H_2O	4.991 ✓ cf	70 ✓ °F	✓	1.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.004 \left[\frac{29.24 + \frac{-13}{13.6}}{69 + 460}\right] \times 1.000\ (C_f) = 4.866\ ✓\ \text{dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 4.991 \left[\frac{29.24 + \frac{1.0}{13.6}}{70 + 460}\right] = 4.872\ ✓\ \text{dcsf}$$

$$C_{DG} = \frac{4.866}{4.872} = \boxed{0.999\ ✓}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

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

Run No.: 1 @ 1.50 "H_2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1049	10,009 cf	69 °F	-16 "H_2O
Start	1034	0.000 cf	69 °F	-16 "H_2O
Avg.	15 ✓	10.009 ✓ cf	69 ✓ °F	-16 ✓ "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
	755.874 cf	65 °F	71 °F	1.50 "H_2O
	745.977 cf	69 °F	71 °F	1.50 "H_2O
	9.897 ✓ cf	69 ✓ °F		✓1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.009 \left[\frac{29.24 + \frac{-16}{13.6}}{69 + 460}\right] \times 1.000 \ (C_f) = 9.725 \text{ ✓ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.897 \left[\frac{29.24 + \frac{1.50}{13.6}}{69 + 460}\right] = 9.692 \text{ ✓ dcsf}$$

$$C_{DG} = \frac{9.725}{9.692} = \boxed{1.003 \text{ ✓}}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29.1

Calibrator: Jason Conway

Date: 11-22-99

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

Run No.: 1 @ 2.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 4.00 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1103	10.088 cf	69 °F	-25 "H_2O
Start	1051	0.000 cf	69 °F	-20 "H_2O
Avg.	12 ✓	10.088 ✓ cf	69 ✓ °F	-25 ✓ "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	766.667 cf	69 °F	72 °F	2.0 "H_2O
Start	756.663 cf	68 °F	72 °F	2.0 "H_2O
Avg.	10.004 ✓ cf	70 ✓ °F		✓2.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.088 \left[\frac{29.24 + \frac{-20}{13.6}}{69 + 460}\right] \times 1.000\ (C_f) = 9.792\ \checkmark\ dcsf$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.004 \left[\frac{29.24 + \frac{2.0}{13.6}}{70 + 460}\right] = 9.790\ \checkmark\ dcsf$$

$$C_{DG} = \frac{9.792}{9.790} = \boxed{1.000\ \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 11-22-99

Calibrator: Jason Conway

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

Run No.: 1 @ 3.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1134	10.011 cf	69 °F	-3.0 "H_2O	789.042 cf	69 °F	73 °F	3.0 "H_2O
Start	1124	0.000 cf	69 °F	-3.0 "H_2O	779.107 cf	69 °F	73 °F	3.0 "H_2O
Avg.	10.0 ✓	10.011 cf	69 ✓ °F	-3.0 ✓ "H_2O	9.935 ✓ cf	70 ✓ °F		✓ 3.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.011 \left[\frac{29.24 + \frac{-3.0}{13.6}}{69 + 460} \right] \times 1{,}000\ (C_f) = 9.693\ \checkmark\ \text{dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.935 \left[\frac{29.24 + \frac{3.0}{13.6}}{70 + 460} \right] = 9.747\ \checkmark\ \text{dcsf}$$

$$C_{DG} = \frac{9.693}{9.747} = \boxed{0.994\ \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-21-99

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

Run No.: 2 @ 4.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1311	10.002 cf	70 °F	-3.8 "H_2O	817.238 cf	68 °F	72 °F	4.0 "H_2O
Start	1302	0.000 cf	70 °F	-3.8 "H_2O	807.425 cf	70 °F	72 °F	4.0 "H_2O
Avg.	9 ✓	10.002 ✓ cf	70 ✓ °F	-3.8 ✓ "H_2O	9.813 ✓ cf	71 ✓ °F		✓ 4.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.002 \left[\frac{29.24 + \frac{-3.8}{13.6}}{70 + 460}\right] \times 1.000\ (C_f) = 9.646\ ✓\ \text{dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.813 \left[\frac{29.24 + \frac{4.0}{13.6}}{71 + 460}\right] = \frac{9.633\ ✓}{\cancel{9.651}\ ✓}\ \text{dcsf}$$

$$C_{DG} = \frac{9.646}{9.651} = \boxed{0.999\ ✓}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

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

Run No.: 1 @ 2 L/min

P_b: 29.15 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 1)

	Time	Meter Reading	Temp.	P_m
End	1637	2.229 cf	70 °F	-0.6 "H_2O
Start	1605	0.000 cf	70 °F	-0.6 "H_2O
Avg.	32 ✓	2.229 ✓ cf	70 ✓ °F	-0.6 ✓ "H_2O

Dry Gas Meter

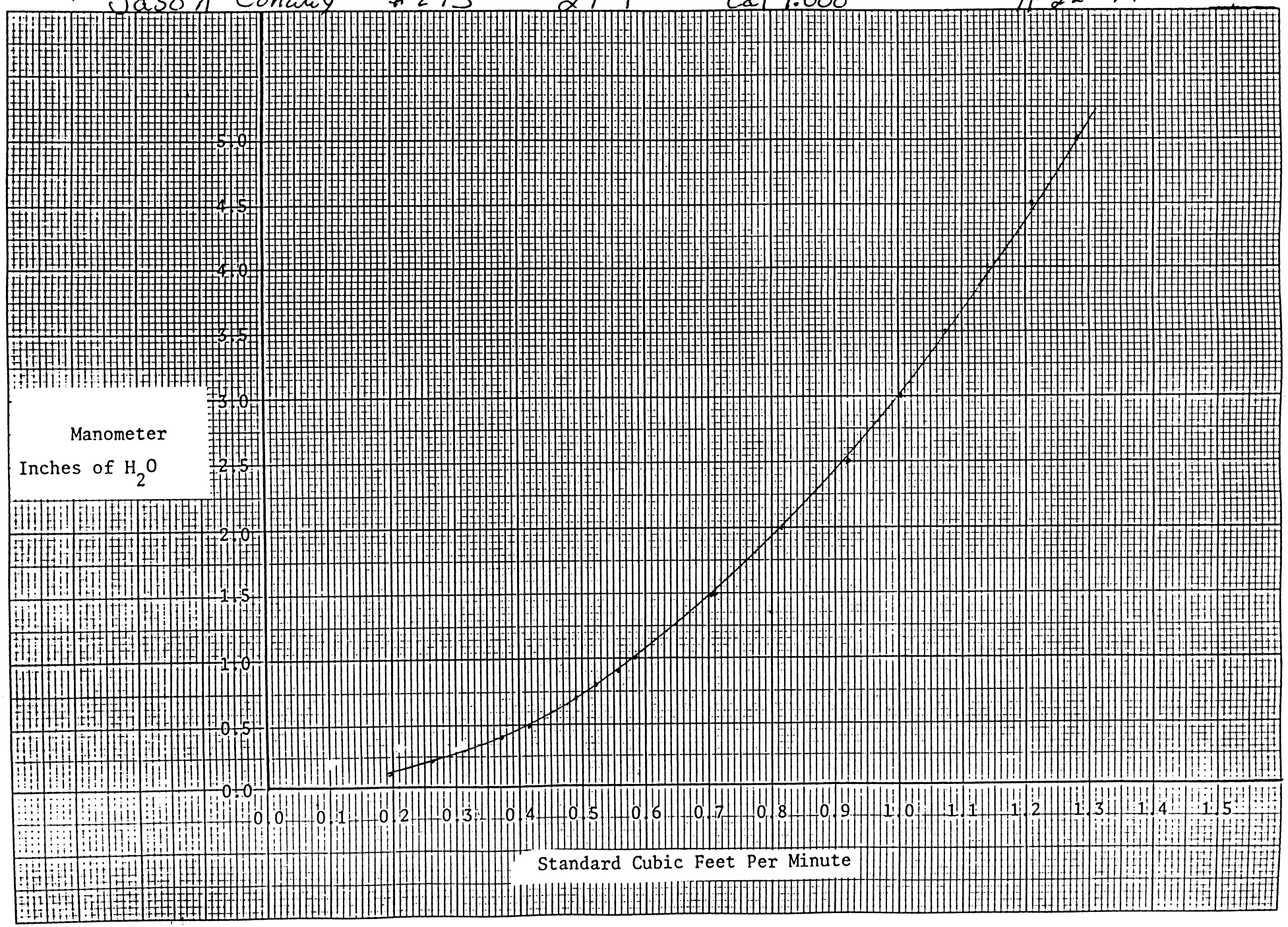
	Meter Reading	Temp. In	Temp. Out	P_m
End	873.468 cf	77 °F	72 °F	0.04 "H_2O
Start	871.246 cf	72 °F	72 °F	0.04 "H_2O
Avg.	2.222 ✓ cf	73 ✓ °F		✓ 0.04 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.229 \left[\frac{29.15 + \frac{-0.6}{13.6}}{70 + 460} \right] \times 1.006 (C_i) = 2.173 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.222 \left[\frac{29.15 + \frac{0.04}{13.6}}{73 + 460} \right] = 2.145 \text{ dcsf}$$

$$C_{DG} = \frac{2.173}{2.145} = \boxed{1.013}$$

Jason Conway #273 29-1 Cal 1.000 11-22-99



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 11-22-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1025	70	70
Ice Bath	1112	35	36
Boiling Water	1050	212	212
Oven	1130	250	251
Oven	1141	300	300
Oven	1153	350	353
Oven	1200	375	375

Meter Adjusted? Yes _____ No ✓

Calibrator: Jason Conway #273

Checked By: Scott Ward #268

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 99-1

Date: 11-22-99

Time: 1115

Barometric Pressure @ Addison Airport @ 719 ft.	=	29.86
	-	0.719
Absolute Pressure @ Addison Airport	=	29.141
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.224
Barometer Reading	=	29.18
Variation	=	0.044

Barometer Adjusted? Yes ✓ No _____

Scott Herr #262 ✓

Signature of Calibrator

APPENDIX D

Analytical Data

TestAmerica
INCORPORATED

January 5, 2000

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

Dear Doug,

Please find included with this letter the analytical report and data package for the TXU Electric samples submitted to TestAmerica for analysis. The samples were analyzed following the SOP based on the Ontario-Hydro Method.

Case Narrative

TestAmerica received on November 22,1999. All samples were intact when received. Please note the following:

- Where thimbles were used, the entire thimble was required to be digested because of low particulate weight. It is not possible digest the entire thimble in one microwave vessel. The thimble was cut into three roughly equal parts and digested separately. The three digestates were combined and brought to a final volume of 150 mL prior to analysis.
- All Matrix Spike sample results had a % Recovery between 75 % and 125 %.
- All other Quality Control Indicators were within acceptance limits.

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
QA Coordinator

3601 South Dixie Drive / Dayton, OH 45439 / 937-294-6856 / Fax: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: Big Brown
TXU Electric
Fairfield, Texas

Hg Analysis
Ontario Hydro Method

Summary Report

	Unit 1 Stack Run 1	Unit 1 Stack Run 2	Unit 1 Stack 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)	0.02	0.01	0.02	3.06	0.67	0.17
Oxidized Hg (ug)	28.17	28.72	31.52	9.84	12.96	17.66
Elemental Hg (ug)	42.82	41.42	37.70	36.86	34.15	27.39
Total Hg (ug)	71.01	70.15	69.24	49.76	47.78	45.22

	Unit 1 Stack Blank Train	Unit 1 Baghouse Inlet Duct Blank Train
Particle Bound Hg (ug)	0.00	0.00
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 # 12A (ug)	<0.030
Container # 12B (ug)	<0.010

TestAmerica
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Sample ID: Big Brown
TXU Electric
Fairfield, Texas

Hg Analysis
Ontario Hydro Method

Duplicate Summary Report

	Unit 1 Stack Run 1	Unit 1 Stack Run 2	Unit 1 Stack 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)	0.02	0.01	0.02	2.97	0.69	0.17
Oxidized Hg (ug)	27.31	27.99	30.74	9.92	12.96	17.60
Elemental Hg (ug)	41.04	41.65	36.82	34.44	34.70	26.80
Total Hg (ug)	68.37	69.65	67.58	47.33	48.35	44.57

	Unit 1 Stack Blank Train	Unit 1 Baghouse Inlet Duct Blank Train
Particle Bound Hg (ug)	0.00	0.00
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 # 12A (ug)	<0.030
Container # 12B (ug)	<0.010

TestAmerica
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Sample ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Stack Run 1

Hg Analysis
Ontario Hydro Method

Collected On: 11/9/99
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	Q105	12/21/99	12/24/99	jpp	0.018	0.017	2.0	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2	2FF-3	12/10/99	12/13/99	jpp	<0.310	<0.310	0	---	---	ug		
Container # 3	3FF-3	12/10/99	12/13/99	jpp	28.17	27.31	3.1	---	---	ug		
Container # 4	4FF-3	12/13/99	12/13/99	jpp	1.26	1.25	<1.0	1.25	<1.0	ug		
Container # 5	5FF-3	12/14/99	12/14/99	jpp	41.56	39.79	4.3	---	---	ug		

Particle Bound Hg (ug) **0.018**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **28.17**
(Containers 3)

Elemental Hg (ug) **42.82**
(Containers 4 and 5)

Total Hg (ug) **71.01**
(Containers 1A, 1B, 2, 3, 4, and 5)

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

Dup. Oxidized Hg (ug) **27.31**
(Containers 3)

Dup. Elemental Hg (ug) **41.04**
(Containers 4 and 5)

Dup. Total Hg (ug) **68.37**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

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TestAmerica
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Sample ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Stack Run 2

Hg Analysis
Ontario Hydro Method

Collected On: 11/9/99
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	Q110	12/21/99	12/24/99	jpp	0.013	0.013	1.5	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2	2FF-5	12/10/99	12/13/99	jpp	<0.094	<0.094	0	<0.094	0	ug		
Container # 3	3FF-5	12/10/99	12/13/99	jpp	28.72	27.99	2.6	---	---	ug		
Container # 4	4FF-5	12/13/99	12/13/99	jpp	1.60	1.61	<1.0	---	---	ug		
Container # 5	5FF-5	12/14/99	12/14/99	jpp	39.82	40.04	<1.0	39.60	<1.0	ug		

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

Oxidized Hg (ug) **28.72**
(Containers 3)

Elemental Hg (ug) **41.42**
(Containers 4 and 5)

Total Hg (ug) **70.15**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.013**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **27.99**
(Containers 3)

Dup. Elemental Hg (ug) **41.65**
(Containers 4 and 5)

Dup. Total Hg (ug) **69.65**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:

TestAmerica
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S mple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Stack Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 11/10/99
C llected By: METCO

Container # 1A - Main Filter
C tainer # 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	Q112	12/21/99	12/24/99	jpp	0.020	0.021	2.9	---	---	ug		
C tainer # 1B		Not Provided		jpp	---	---	---	---	---	ug		
C tainer # 2	2FF-7	12/10/99	12/13/99	jpp	<0.094	<0.094	0	---	---	ug		
Container # 3	3FF-7	12/10/99	12/13/99	jpp	31.52	30.74	2.5	---	---	ug		
C tainer # 4	4FF-7	12/13/99	12/13/99	jpp	1.26	1.30	3.6	1.32	4.7	ug		
C tainer # 5	5FF-7	12/14/99	12/14/99	jpp	36.44	35.52	2.6	---	---	ug		

P icle Bound Hg (ug) **0.020**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **31.52**
(Containers 3)

Elemental Hg (ug) **37.70**
(Containers 4 and 5)

Total Hg (ug) **69.24**
(Containers 1A, 1B, 2, 3, 4, and 5)

D . Part. Bound Hg (ug) **0.021**
Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **30.74**
(Containers 3)

Dup. Elemental Hg (ug) **36.82**
(Containers 4 and 5)

Dup. Total Hg (ug) **67.58**
(Containers 1A, 1B, 2, 3, 4, and 5)

N s:

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Sample ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Baghouse Inlet Duct Run 1

Hg Analysis
Ontario Hydro Method

Collected On: 11/9/99
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	Q58	12/21/99	12/24/99	jpp	3.05	2.96	3.0	---	---	ug		*1
Container # 1B	Q106	12/21/99	12/24/99	jpp	0.013	0.013	<1.0	---	---	ug		
Container # 2	2FF-4	12/10/99	12/13/99	jpp	<0.300	<0.300	0	---	---	ug		
Container # 3	3FF-4	12/10/99	12/13/99	jpp	9.84	9.92	<1.0	10.00	1.7	ug		
Container # 4	4FF-4	12/13/99	12/13/99	jpp	<0.820	<0.820	0	---	---	ug		
Container # 5	5FF-4	12/14/99	12/14/99	jpp	36.86	34.44	6.8	---	---	ug		

Particle Bound Hg (ug) **3.063**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **9.84**
(Containers 3)

Elemental Hg (ug) **36.86**
(Containers 4 and 5)

Total Hg (ug) **49.76**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **2.973**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **9.92**
(Containers 3)

Dup. Elemental Hg (ug) **34.44**
(Containers 4 and 5)

Dup. Total Hg (ug) **47.33**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 - The entire thimble was required to be digested. It is not possible digest the entire thimble in one microwave vessel. The thimble was cut into three roughly equal parts and digested separately. The three digestates were combined and brought to a final volume of 150 mL prior to analysis.

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S mple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Baghouse Inlet Duct Run 2

Hg Analysis
Ontario Hydro Method

Collected On: 11/9/99
C llected By: METCO

Container # 1A - Main Filter
C ıtainer # 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	Q59	12/21/99	12/24/99	jpp	0.667	0.690	3.4	0.691	3.5	ug		*1
C ıtainer # 1B	Q111	12/21/99	12/24/99	jpp	<0.010	<0.010	0	---	---	ug		
C ıtainer # 2	2FF-6	12/10/99	12/13/99	jpp	<0.200	<0.200	0	---	---	ug		
Container # 3	3FF-6	12/10/99	12/13/99	jpp	12.96	12.96	0	---	---	ug		
C ntainer # 4	4FF-6	12/13/99	12/13/99	jpp	1.09	1.07	1.9	---	---	ug		
C ıtainer # 5	5FF-6	12/14/99	12/14/99	jpp	33.06	33.63	1.7	---	---	ug		

P ticle Bound Hg (ug) **0.667**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **12.96**
(Containers 3)

Elemental Hg (ug) **34.15**
(Containers 4 and 5)

Total Hg (ug) **47.78**
(Containers 1A, 1B, 2, 3, 4, and 5)

D ı. Part. Bound Hg (ug) **0.690**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **12.96**
(Containers 3)

Dup. Elemental Hg (ug) **34.70**
(Containers 4 and 5)

Dup. Total Hg (ug) **48.35**
(Containers 1A, 1B, 2, 3, 4, and 5)

N es: *1.- The entire thimble was required to be digested. It is not possible digest the entire thimble in one microwave vessel. The thimble was cut into three roughly equal parts and digested separately. The three digestates were combined and brought to a final volume of 150 mL prior to analysis.

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S mple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Baghouse Inlet Duct Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 11/10/99
C llected By: METCO

Container # 1A - Main Filter
C tainer # 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	Q77	12/21/99	12/24/99	jpp	0.152	0.150	<1.0	---	---	ug		*1
C tainer # 1B	Q114	12/21/99	12/24/99	jpp	0.020	0.020	2.5	0.020	3.7	ug		
C tainer # 2	2FF-8	12/10/99	12/13/99	jpp	<0.220	<0.220	0	---	---	ug		
Container # 3	3FF-8	12/10/99	12/13/99	jpp	17.66	17.60	<1.0	---	---	ug		
Container # 4	4FF-8	12/13/99	12/13/99	jpp	1.19	1.20	<1.0	---	---	ug		
C tainer # 5	5FF-8	12/14/99	12/14/99	jpp	26.20	25.60	2.3	---	---	ug		

P. icle Bound Hg (ug) **0.172**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **17.66**
(Containers 3)

Elemental Hg (ug) **27.39**
(Containers 4 and 5)

Total Hg (ug) **45.22**
(Containers 1A, 1B, 2, 3, 4, and 5)

D. . Part. Bound Hg (ug) **0.170**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **17.60**
(Containers 3)

Dup. Elemental Hg (ug) **26.80**
(Containers 4 and 5)

Dup. Total Hg (ug) **44.57**
(Containers 1A, 1B, 2, 3, 4, and 5)

N s: *1.- The entire thimble was required to be digested. It is not possible digest the entire thimble in one microwave vessel. The thimble was cut into three roughly equal parts and digested separately. The three digestates were combined and brought to a final volume of 150 mL prior to analysis.

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S mple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Stack Blank Train

Hg Analysis
Ontario Hydro Method

Collected On: 11/10/99
C llected By: METCO

Container # 1A - Main Filter
C tainer # 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		
C tainer # 1B		Not Provided		jpp	---	---	---	---	---	ug		
C tainer # 2		Not Provided		jpp	---	---	---	---	---	ug		
Container # 3	3FF-1	12/10/99	12/13/99	jpp	<0.950	<0.950	0	---	---	ug		
C ntainer # 4	4FF-1	12/13/99	12/13/99	jpp	<0.640	<0.640	0	---	---	ug		
C tainer # 5	5FF-1	12/14/99	12/14/99	jpp	<0.890	<0.890	0	---	---	ug		

P ticle 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) **0.00**
(Containers 1A, 1B, 2, 3, 4, and 5)

D . 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) **0.00**
(Containers 1A, 1B, 2, 3, 4, and 5)

N es:

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

TestAmerica
INCORPORATED

S. nple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Unit 1 Baghouse Inlet Duct Blank Train

Hg Analysis
Ontario Hydro Method

Collected On: 11/10/99
C lected By: METCO

Container # 1A - Main Filter
Co tainer # 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		
Co tainer # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Co tainer # 2		Not Provided		jpp	---	---	---	---	---	ug		
Container # 3	3FF-2	12/10/99	12/13/99	jpp	<0.970	<0.970	0	---	---	ug		
Co tainer # 4	4FF-2	12/13/99	12/13/99	jpp	<0.640	<0.640	0	---	---	ug		
Co tainer # 5	5FF-2	12/14/99	12/14/99	jpp	<1.00	<1.00	0	---	---	ug		

Pa icle 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:

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TestAmerica
INCORPORATED

S mple ID: **Big Brown**
TXU Electric
Fairfield, Texas
Reagent Blanks

Hg Analysis
Ontario Hydro Method

Collected On: 11/9/99
C llected By: METCO

Container # 7 - 0.1 N HNO_3 Blank
C tainer # 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	RBFF-7	---	12/13/99	jpp	<0.2	<0.2	0	---	---	ug/L		
C tainer # 8	RBFF-8	12/10/99	12/13/99	jpp	<2.0	<2.0	0	---	---	ug/L		
C tainer # 9	RBFF-9	12/13/99	12/13/99	jpp	<4.0	<4.0	0	---	---	ug/L		
Container # 10	RBFF-10	12/14/99	12/14/99	jpp	<2.0	<2.0	0	---	---	ug/L		
Container # 11	RBFF-11	---	12/13/99	jpp	<0.2	<0.2	0	---	---	ug/L		
C tainer # 12A	Q61	12/21/99	12/24/99	jpp	<0.030	<0.030	0	---	---	ug		*1
Container # 12B	Q107	12/21/99	12/24/99	jpp	<0.010	<0.010	0	---	---	ug		

N s: *1.- The entire thimble was required to be digested. It is not possible digest the entire thimble in one microwave vessel. The thimble was cut into three roughly equal parts and digested separately. The three digestates were combined and brought to a final volume of 150 mL prior to analysis.

Mercury Sample Train Receipt

Mercury Sample Train Receipt Record

Client ID
BIG BROWN.
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT #1
STACK
BLANK TRAIN

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___.		
☒ 3 (1)	475 + ___ + ___ = 475.	3FF-1	
☒ 4 (1)	160 + ___ + ___ = 160.	4FF-1	
☒ 5 (1)	445 + ___ + ___ = 445.	5FF-1	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT 1
BAGHOUSE INLET DUCT
BLANK TRAIN

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___.		
☑ 3 (1)	485 + ___ + ___ = 485.	3FF·2	
☑ 4 (1)	160 + ___ + ___ = 160.	4FF-2	
☑ 5 (1)	500 + ___ + ___ = 500.	5FF-2	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID	Location ID/Run #
BIG BROWN	UNIT 1
TXU	STACK
FAIRFIELD, TX	RUN #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	155 + ___ + ___ = 155.	2FF-3	
☒ 3 (2)	460 + 360 + ___ = 820.	3FF-3	
☒ 4 (1)	190 + ___ + ___ = 190.	4FF-3	
☒ 5 (1)	505 + ___ + ___ = 505.	5FF-3	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A ( )	Q105		
☐ 1B ( )			
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS

Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT 1
BAGHOUSE INLET DUCT
RUN 1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	150 + ___ + ___ = 150.	2FF-4	
☒ 3 (2)	440 + 380 + ___ = 820.	3FF-4	
☒ 4 (1)	205 + ___ + ___ = 205.	4FF-4	
☒ 5 (1)	485 + ___ + ___ = 485.	5FF-4	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A (1)	Q58		
☒ 1B (1)	Q106		
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT 1 STACK
RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	47 + ___ + ___ = 47.	2FF-5	
☒ 3 (2)	410 + 360 + ___ = 770.	3FF-5	
☒ 4 (1)	140 + ___ + ___ = 140.	4FF-5	
☒ 5 (1)	440 + ___ + ___ = 440.	5FF-5	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A (1)	Q110		
☐ 1B ( )			
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT 1
BAGHOUSE INLET DUCT
RUN #2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	100 + ___ + ___ = 100.	ZFF-6	
☒ 3 (2)	455 + 415 + ___ = 870.	3FF-6	
☒ 4 (1)	205 + ___ + ___ = 205.	4FF-6	
☒ 5 (2)	470 + 100 + ___ = 570.	5FF-6	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A (1)	Q59		
☒ 1B (1)	Q111		
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica
INCORPORATED

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT 1
STACK
RUN 3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	47 + ___ + ___ = 47.	2FF-7	
☒ 3 (2)	485 + 225 + ___ = 710.	3FF-7	
☒ 4 (1)	115 + ___ + ___ = 115.	4FF-7	
☒ 5 (1)	400 + ___ + ___ = 400.	5FF-7	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A (1)	Q112		
☐ 1B ( )			
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SLS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT #1
BAGHOUSE INLET DUCT
RUN #3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☒ 2 (1)	110 + ___ + ___ = 110.	ZFF-8	
☒ 3 (2)	455 + 185 + ___ = 640.	3FF-8	
☒ 4 (1)	125 + ___ + ___ = 125.	4FF-8	
☒ 5 (1)	400 + ___ + ___ = 400.	5FF-8	
☐ 7 ( )	___ + ___ + ___ = ___.		
☐ 8 ( )	___ + ___ + ___ = ___.		
☐ 9 ( )	___ + ___ + ___ = ___.		
☐ 10 ( )	___ + ___ + ___ = ___.		
☐ 11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
☒ 1A (1)	Q77		
☒ 1B (1)	Q114		
☐ 12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: SGS
Date: 11/24/99

TestAmerica

Mercury Sample Train Receipt Record

Client ID
BIG BROWN
TXU
FAIRFIELD, TX

Location ID/Run #
UNIT # 1
REAGENT BLANKS

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
☐ 2 ( )	___ + ___ + ___ = ___ .		
☐ 3 ( )	___ + ___ + ___ = ___ .		
☐ 4 ( )	___ + ___ + ___ = ___ .		
☐ 5 ( )	___ + ___ + ___ = ___ .		
☑ 7 (1)	49 + ___ + ___ = 49 .	RBFF-7	
☑ 8 (1)	50 + ___ + ___ = 50 .	RBFF-8	
☑ 9 (1)	50 + ___ + ___ = 50 .	RBFF-9	
☑ 10 (1)	46 + ___ + ___ = 46 .	RBFF-10	
☑ 11 (1)	99 + ___ + ___ = 99 .	RBFF-11	

Filters:

Cont. ID/(#)	Filter ID(s)		
☐ 1A ( )			
☐ 1B ( )			
☑ 12	(47 mm)		
	Q107, Q108, Q109 (88 mm)		
	Q61, Q62, Q63 (Thimble)		
	Q76 JAD		

Notes: _____

Checked By: SLS
Date: 11/24/99

TestAmerica

Prep Batch Sheets

BIG BROWN TXU ELEC.
FAIRFIELD, TX

NONAQUEOUS MERCURY BATCH SHEET

Analyst: JMP Date: 12/21/99 (12/24/99) Water Bath: start mid end

Standard Reference: 65-41-17 temp: _____

ICV Reference: 65-41-18 date: _____

		Sample # / Client	Weight	MS	MSD
9	1	Q771(1) V_f=150mL			
	2	Q771(2)			
	3	Q771(3)			
8	4	472107			
7	5	472105			
6	6	472110			
5	7	472112			
4	8	472106 SPK			
3	9	472114 TRP			
2	10	NIST 1633B	0.5835	85.68	
1	11	BLANK			

MB	ICV	MS	MSD	RPD	FLAG

HF - 65-27-14
HCl - 65-50-15
HNO_3 - 65-49-14
Boric Acid - 65-50-14
$SnCl_2$ - 66-31-19

SECONDARY DATA CHECK: analyst:
date:

Comments: THIMBLES Q58, 059, 061 ENTIRE THIMBLE DIGESTED
(1) CUT THIMBLE INTO EQUAL THIRDS
(2) ADD PARTICULATE TO ANY ONE
(3) DIGEST SEPARATELY
(4) COMBINE DIGESTATES IN PREMARKED HF RESISTANT BTL
(5) BRING UP TO 150mL WITH DI

BIG BROWN TXU ELECTRIC
FAIRFIELD, TX

NONAQUEOUS MERCURY BATCH SHEET

Analyst: SRP Date: 12/21/99 (12/24/99) Water Bath: start mid end

Standard Reference: 65-41-17 temp: _____

ICV Reference: 65-41-18 date: _____

		Sample # / Client	Weight	MS	MSD
10	16	1 Q58 (1) VF = 150mL	—	—	—
		2 Q58 (2)	—		
		3 Q58 (3)	—		MB
11	17	4 Q59 (1) TRP	—		
		5 Q59 (2)	—		
		6 Q59 (3)	—		
12	18	7 Q61 (1) SPK	—		ICV
		8 Q61 (2)	—		
		9 Q61 (3)	—		
13	19	10 472111	—		
14	4	11 NIST 1633b	0.5840	85.62	MS
15	2	12 BLANK	—		
					MSD
					RPD

HF-65-27-17
HCl-65-50-15
HNO_3-65-48-14
Boric Acid-65-5014
$SnCl_2$-66-31-19

SECONDARY DATA CHECK: analyst:
date:

FLAG

Comments: THIMBLES Q58, Q59, Q61 ENTIRE THIMBLE DIGESTED
(1) CUT INTO EQUAL THIRDS
(2) ADD PARTICULATE TO ANY ONE
(3) DIGEST SEPARATELY
(4) COMBINE DIGESTATES IN PREMARKED HF RESISTANT BTL
(5) BRING UP TO 150mL WITH DI

AQUEOUS MERCURY BATCH SHEET

analyst: SGS/MRP date: 12-14-94 WATER BATH: start mid end

temp: _____

standard reference #: 65-41-17

time: _____

icv reference #: 65-41-18

sample # / client		prep info
BLANK		
MS		
MSD		
SFF-1	445	
SFF-2	500	
SFF-3	505	
SFF-4	485	
SFF-5	MRP 440	
SFF-6	SPK 570	
SFF-7	400	
SFF-8	400	
RBFF-10	48	

MB	ICV

MS	MSD

RPD	FLAG

SECONDARY DATA CHECK:

ANALYST:

DATE:

comments: HYDROX. HCl = 65-41-2
SnCl2 - 65-47-8

~~NONAQUEOUS MERCURY BATCH SHEET~~

Analyst: MP Date: 12/10/99 Water Bath: start mid end

Standard Reference: 65-41-17 temp: _____

ICV Reference: 65-41-18 date: _____

Sample # / Client	Weight	MS	MSD
FFBLK	—	—	—
2FF3 (155mL)	5-50.mL		
2FF4 150			
2FF5 TRP 47			
2FF6 SPIK 100			
2FF7 47			
2FF8 110			
3FF1 475			
3FF2 485			
3FF3 820			
3FF4 TRP 820			
3FF5 SPIK 770			
3FF6 870			
3FF7 710			
3FF8 640			
RBFF5 50			

MB

ICV

MS

MSD

RPD

FLAG

SECONDARY DATA CHECK: analyst:
date:

Comments: H_2SO_4 65-38-9
HNO_3 65-45-13
$KMnO_4$ 65-44-18
$K_2S_2O_8$ 65-43-12
$SnCl_2$ 65-47-7
65-47-8

AQUEOUS MERCURY BATCH SHEET

analyst: YS | date: 12-13-99 | WATER BATH: start mid end

temp: _____

standard reference #: 65-41-17

time: _____

icv reference #: 65-41-18

sample # / client		prep info
BLANK		2.5 -> 50
MS		
MSD		
4FF-1	160	
4FF-2	160	
4FF-3 TRP	190	
4FF-4 SPIC	205	
4FF-5	140	
4FF-6	205	
4FF-7 TRP	115	
4FF-8 SPK	125	
RBFF-9	50	
ICBFF-7	49	
ICBFF-11	99	

MB	ICV

MS	MSD

RPD	FLAG

SECONDARY DATA CHECK:

ANALYST:

DATE:

comments: HCl = 65-45-15 / $KMnO_8$ = 65-46-15 / HYDROX. HCl = 65-41-3

SnCl2 65-47-8

12/13/99 Analytical Run

```
Protocol: SYSTEST
                    Rev: 3.001   Time: 18:05:00  13 Dec 1999
Folder: DEC99B      Seq: 167                    Print: On
User:               Batch:            Id: ccv        Cup: 1 41 Gas:    0.33 LPM
State: Idle                                         Unit: Off Autosampler: On
```

AUTOSAMPLER: Rack entry Rack 121099a

Cup	Id	Extended Id	Weight	Volume	Macro check Help
1	ccc		1.0000	1.0000	
2	ff clk		1.0000	1.0000	
3	ff clk cup		1.0000	1.0000	
4	2ff3		1.0000	1.0000	
5	2ff3 cup		1.0000	1.0000	
6	2ff4		1.0000	1.0000	
7	2ff4 cup		1.0000	1.0000	
8	2ff5		1.0000	1.0000	
9	2ff5 cup		1.0000	1.0000	
10	2ff5 trb		1.0000	1.0000	
11	2ff6		1.0000	1.0000	
12	2ff6 cup		1.0000	1.0000	
13	2ff6 spk		1.0000	1.0000	
14	2ff7		1.0000	1.0000	
15	2ff7 cup		1.0000	1.0000	

PgDn

```
Cup 1  ID: ccc                                  Cell entry, Ins to switch
                                                                  129 9  12
```

Protocol: SYSTEST

Rev: 3.001 Time: 18:05:20 13 Dec 1999

Folder: DEC99B Seq: 167 Print: On

User: Batch: Id: ccv Cup: 1 41 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

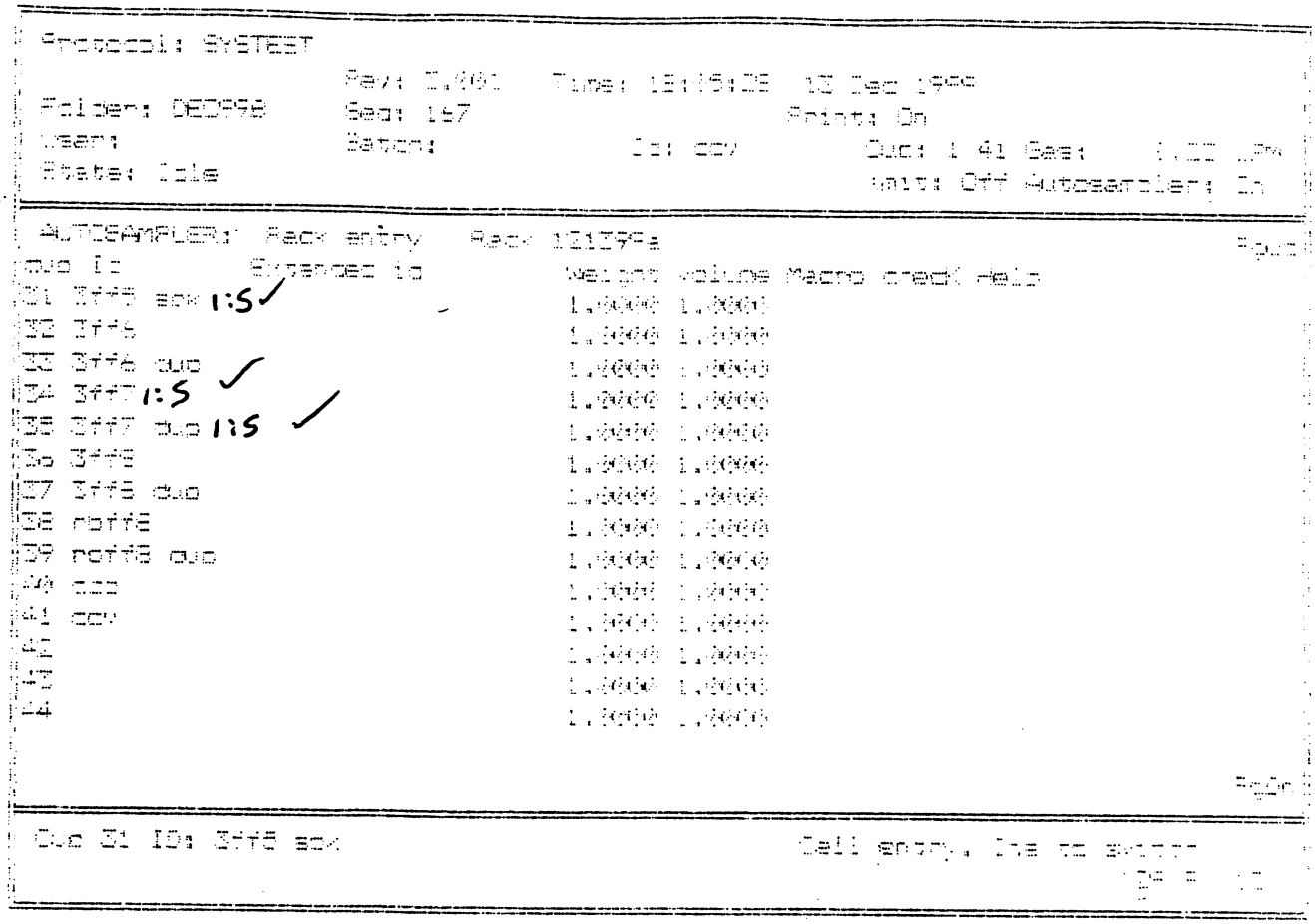
AUTOSAMPLER: Rack entry Rack 121399a Pgup

Cup	Id	Extended id	Weight	Volume	Macro check	Help
16	2ff8		1.0000	1.0000		
17	2ff8	dup	1.0000	1.0000		
18	3ff1		1.0000	1.0000		
19	3ff1	dup	1.0000	1.0000		
20	3ff2		1.0000	1.0000		
21	3ff2	dup	1.0000	1.0000		
22	3ff3	1:5	1.0000	1.0000		
23	3ff3	dup 1:5	1.0000	1.0000		
24	ccc		1.0000	1.0000		
25	ccv		1.0000	1.0000		
26	3ff4		1.0000	1.0000		
27	3ff4	dup	1.0000	1.0000		
28	3ff4	trc	1.0000	1.0000		
29	3ff5	1:5	1.0000	1.0000		
30	3ff5	dup 1:5	1.0000	1.0000		

PgDn

Cup 16 ID: 2ff8 Cell entry, Ins to switch

29 9 12



Protocol: SYSTEST

Rev: 3.001 Time: 15:05:25 13 Dec 1999

Folder: DEC998 Seq: 167 Print: On

User: Batch: Id: ccv Dup: 1 41 Gas: [illegible] LPM

State: Idle Unit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 121399a Rpud

Dup Id	Extended id	Weight	Volume	Macro check	Help
31 3ff5 spk 1:5 ✓		1.0000	1.0000		
32 3ff6		1.0000	1.0000		
33 3ff6 dup ✓		1.0000	1.0000		
34 3ff7 1:5 ✓		1.0000	1.0000		
35 3ff7 dup 1:5 ✓		1.0000	1.0000		
36 3ff8		1.0000	1.0000		
37 3ff8 dup		1.0000	1.0000		
38 rbff8		1.0000	1.0000		
39 rbff8 dup		1.0000	1.0000		
40 ccb		1.0000	1.0000		
41 ccv		1.0000	1.0000		
42		1.0000	1.0000		
43		1.0000	1.0000		
44		1.0000	1.0000		

RpDn

Dup 31 ID: 3ff5 spk Cell entry, Ins to switch

[illegible]

```
Protocol: SYSTEST
                    Rev: 3.001    Time: 22:06:04   13 Dec 1999
Folder: DEC999      Seq: 258                       Print: On
User:               Batch:              Id: 4ff6        Cup: 1 44 Gas:     0.23 LPM
State: Idle                                            Xmit: Off Autosampler: On
```

AUTOSAMPLER: Rack entry Rack 121399a

Cup	Id	Extended id	Weight	Volume	Macro check	Help
1	icc		1.0000	1.0000		
2	4ff6 dup		1.0000	1.0000		
3	ccp		1.0000	1.0000		
4	ccv		1.0000	1.0000		
5	4ff7		1.0000	1.0000		
6	4ff7 dup		1.0000	1.0000		
7	4ff7 trp		1.0000	1.0000		
8	4ff8		1.0000	1.0000		
9	4ff8 dup		1.0000	1.0000		
10	4ff8 sck		1.0000	1.0000		
11	rcff9		1.0000	1.0000		
12	rcff9 dup		1.0000	1.0000		
13	rcff7		1.0000	1.0000		
14	rcff7 dup		1.0000	1.0000		
15	rcff11		1.0000	1.0000		

Cup 1 ID: icc Call entry, Ins to switch

Protocol: SYSTEST

Rev: 3.001 Time: 22:06:10 13 Dec 1999

Folder: DEC998 Seq: 258 Print: On

User: Batch: Id: 4ff6 Cup: 1.44 Gas: 0.22 LPM

State: Idle Amit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 121399a PgUp

Cup Id	Extended Id	Weight	Volume	Macro check	Held
16 rofflicup		1.0000	1.0000		
17 ccc		1.0000	1.0000		
18 ccv		1.0000	1.0000		
19		1.0000	1.0000		
20		1.0000	1.0000		
21		1.0000	1.0000		
22		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: rofflicup Cell entry, line to switch

129 9 12

*** Standard: 1 Rep: 1 Seq: 119 15:48:31 13 Dec 1999 HG

Hg .000 ug/L -278

Ave. Int. = -278 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 120 15:50:53 13 Dec 1999 HG

Hg .200 ug/L 10435

Ave. Int. = 10435 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 121 15:53:16 13 Dec 1999 HG

Hg .500 ug/L 26994

Ave. Int. = 26994 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 122 15:55:38 13 Dec 1999 HG

Hg 1.00 ug/L 53326

Ave. Int. = 53326 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 123 15:58:00 13 Dec 1999 HG

Hg 2.00 ug/L 108501

Ave. Int. = 108501 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 124 16:10:25 13 Dec 1999 HG

Hg 3.00 ug/L 158504

Ave. Int. = 158504 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 16:13:39 13 Dec 1999

Folder: DEC99B Seq: 125 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.
S1	.000	-.008	-.008
S2	.200	.193	-.007
S3	.500	.504	.004
S4	1.00	.999	-.001
S5	2.00	2.04	.036
S6	3.00	2.98	-.025
A	.0000000	r	.999852
B	1.87897e-5	C	-2.83157e-3

Accepted

LiNear

Quadratic

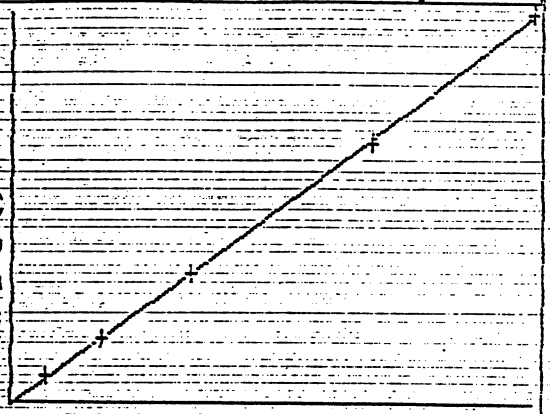
WtdLinear

C

Accept o

n

StdAdd c



Relative Absorbance

	Mean	%RSD	
S1	-278	0	-278
S2	10435	0	10435
S3	26994	0	26994
S4	53326	0	53326
S5	108501	0	108501
S6	158504	0	158504

33?

New calibration coefficients stored 149 2 5

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

***-Check-Standard: 2 Ck2 Seq: 125 16:15:37 13 Dec 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		103.	.623	.604	ug/L	.000

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: [illegible]				Seq:	167	18:07:52	13 Dec 1999	HG	
Hg	-.005	ug/L	.000	-.005					<0.20 µg/L
*** Sample ID: ff blk				Seq:	168	18:10:10	13 Dec 1999	HG	
Hg	.005	ug/L	.000	.005					<0.20 µg/L
*** Sample ID: ff blk dup				Seq:	169	18:12:28	13 Dec 1999	HG	
Hg	.004	ug/L	.000	.004					<0.200 µg/L
*** Sample ID: 2ff3				Seq:	170	18:14:46	13 Dec 1999	HG	
Hg	.008	ug/L	.000	.008					<0.310 µg
*** Sample ID: 2ff3 dup				Seq:	171	18:17:04	13 Dec 1999	HG	RPD = <1.0%
Hg	.008	ug/L	.000	.008					<0.310 µg
*** Sample ID: 2ff4				Seq:	172	18:19:22	13 Dec 1999	HG	
Hg	.038	ug/L	.000	.038					<0.300 µg
*** Sample ID: 2ff4 dup				Seq:	173	18:21:40	13 Dec 1999	HG	RPD = <1.0%
Hg	.038	ug/L	.000	.038					<0.300 µg
*** Sample ID: 2ff5				Seq:	174	18:23:58	13 Dec 1999	HG	
Hg	.002	ug/L	.000	.002					<0.094 µg
*** Sample ID: 2ff5 dup				Seq:	175	18:26:16	13 Dec 1999	HG	RPD = <1.0%
Hg	.003	ug/L	.000	.003					<0.094 µg
*** Sample ID: 2ff5 trp				Seq:	176	18:28:34	13 Dec 1999	HG	RPD = <1.0%
Hg	.004	ug/L	.000	.004					<0.094 µg
*** Sample ID: 2ff6				Seq:	177	18:30:52	13 Dec 1999	HG	
Hg	.026	ug/L	.000	.026					<0.200 µg
*** Sample ID: 2ff6 dup				Seq:	178	18:33:09	13 Dec 1999	HG	RPD = <1.0%
Hg	.026	ug/L	.000	.026					<0.200 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 2ff6 spk				Seq:	179	18:35:26 13 Dec 1999 HG			
Hg	1.05	ug/L	.000	1.05					TV=1.00 105%
*** Sample ID: 2ff7				Seq:	180	18:37:44 13 Dec 1999 HG			
Hg	-.003	ug/L	.000	-.003					<0.094µg
*** Sample ID: 2ff7 dup				Seq:	181	18:40:02 13 Dec 1999 HG			RPD=<1.0%
Hg	.006	ug/L	.000	.006					<0.094µg
*** Sample ID: 2ff8				Seq:	182	18:42:20 13 Dec 1999 HG			
Hg	.017	ug/L	.000	.017					<0.220µg
*** Sample ID: 2ff8 dup				Seq:	183	18:44:38 13 Dec 1999 HG			RPD=<1.0%
Hg	.017	ug/L	.000	.017					<0.220µg
*** Sample ID: 3ff1				Seq:	184	18:46:56 13 Dec 1999 HG			
Hg	.025	ug/L	.000	.025					<0.950µg
*** Sample ID: 3ff1 dup				Seq:	185	18:49:14 13 Dec 1999 HG			RPD=<1.0%
Hg	.026	ug/L	.000	.026					<0.950µg
*** Sample ID: 3ff2				Seq:	186	18:51:32 13 Dec 1999 HG			
Hg	.028	ug/L	.000	.028					<0.970µg
*** Sample ID: 3ff2 dup				Seq:	187	18:53:50 13 Dec 1999 HG			RPD=<1.0%
Hg	.027	ug/L	.000	.027					<0.970µg
*** Sample ID: 3ff3				Seq:	188	18:56:08 13 Dec 1999 HG			
Hg	3.46	ug/L	.000	3.46					NO DATA, >LR
*** Sample ID: 3ff3 dup				Seq:	189	18:58:37 13 Dec 1999 HG			
Hg	3.45	ug/L	.000	3.45					NO DATA, >LR
*** Sample ID: ccc				Seq:	190	19:01:07 13 Dec 1999 HG			
Hg	-.019	ug/L	.000	-.019					<0.200µg/L

Line	Conc.	Units	SD/REP	1	2	3	4	5	
*** Sample ID: ccv					Seq: 191	19:02:26 13 Dec 1999 -6			
Hg	2.00	ug/L	.000	2.00					TV=2.00
									100%
*** Sample ID: Iff4					Seq: 192	19:08:46 13 Dec 1999 -6			
Hg	1.20	ug/L	.000	1.20					9.84µg
*** Sample ID: Iff4 dup					Seq: 193	19:08:06 13 Dec 1999 -6			RPD=<1.0%
Hg	1.21	ug/L	.000	1.21					9.92µg
*** Sample ID: Iff4 trp					Seq: 194	19:10:27 13 Dec 1999 -6			RPD=1.7%
Hg	1.22	ug/L	.000	1.22					10.00µg
*** Sample ID: Iff5					Seq: 195	19:12:47 13 Dec 1999 -6			
Hg	3.86	ug/L	.000	3.86					NODATA
*** Sample ID: Iff5 dup					Seq: 196	19:15:16 13 Dec 1999 -6			
Hg	3.89	ug/L	.000	3.89					NODATA
*** Sample ID: Iff5 sdx					Seq: 197	19:17:41 13 Dec 1999 -6			
Hg	4.83	ug/L	.000	4.83					NODATA
*** Sample ID: Iff6					Seq: 198	19:20:10 13 Dec 1999 -6			
Hg	1.49	ug/L	.000	1.49					12.96µg
*** Sample ID: Iff6 dup					Seq: 199	19:22:31 13 Dec 1999 -6			RPD=<1.0%
Hg	1.49	ug/L	.000	1.49					12.96µg
*** Sample ID: Iff7					Seq: 200	19:24:52 13 Dec 1999 -6			
Hg	4.37	ug/L	.000	4.37					NODATA
*** Sample ID: Iff7			1:5		Seq: 201	19:29:32 13 Dec 1999 -6			
Hg	.388	ug/L	.000	.388					31.52µg
*** Sample ID: Iff7 dup			1:5		Seq: 202	19:34:52 13 Dec 1999 -6			RPD=2.5%
Hg	.386	ug/L	.000	.386					30.74µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Iff8					Seq: 203	19:33:13 13 Dec 1999 HG		
Hg	2.76	ug/L	.000	2.76				
*** Sample ID: Iff8 dup					Seq: 204	19:35:39 13 Dec 1999 HG		
Hg	2.75	ug/L	.000	2.75				
*** Sample ID: rnff8					Seq: 205	19:38:04 13 Dec 1999 HG		
Hg	-.012	ug/L	.000	-.012				
*** Sample ID: rnff8 dup					Seq: 206	19:40:25 13 Dec 1999 HG		
Hg	.003	ug/L	.000	.003				
*** Sample ID: Iff3					Seq: 207	19:42:51 13 Dec 1999 HG		
Hg	.687	ug/L	.000	.687				
*** Sample ID: Iff3 dup					Seq: 208	19:45:16 13 Dec 1999 HG		
Hg	.686	ug/L	.000	.686				
*** Sample ID: Iff3					Seq: 209	19:56:22 13 Dec 1999 HG		
Hg	.746	ug/L	.000	.746				
*** Sample ID: Iff3 dup					Seq: 210	19:58:51 13 Dec 1999 HG		
Hg	.727	ug/L	.000	.727				
*** Sample ID: Iff3 spk					Seq: 211	20:01:17 13 Dec 1999 HG		
Hg	1.74	ug/L	.000	1.74				
*** Sample ID: ccb					Seq: 212	20:11:40 13 Dec 1999 HG		
Hg	-.004	ug/L	.000	-.004				
*** Sample ID: ccv					Seq: 213	20:13:21 13 Dec 1999 HG		
Hg	1.75	ug/L	.000	1.75				

17.66 µg

RPD = <1.0%

17.60 µg

< 2.00 µg/L

RPD = <1.0%

< 2.00 µg/L

1:5

28.17 µg

1:5

RPD = 3.1%

27.31 µg

1:5

28.72 µg

1:5

RPD = 2.6%

27.99 µg

TV = 1.0

99%

< 0.200 µg/L

TV = 2.00

98%

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 4de4 dup				Seq: 226	20:48:09 13 Dec 1999 HG			
Hg	.020	ug/L	.000	.020				
*** Sample ID: 4de5				Seq: 227	20:50:26 13 Dec 1999 HG			
Hg	.034	ug/L	.000	.034				
*** Sample ID: 4de5 dup				Seq: 228	20:52:44 13 Dec 1999 HG			
Hg	.036	ug/L	.000	.036				
*** Sample ID: 4de6				Seq: 229	20:55:02 13 Dec 1999 HG			
Hg	.023	ug/L	.000	.023				
*** Sample ID: 4de6 dup				Seq: 230	20:57:20 13 Dec 1999 HG			
Hg	.022	ug/L	.000	.022				
*** Sample ID: 4de7				Seq: 231	20:59:38 13 Dec 1999 HG			
Hg	.068	ug/L	.000	.068				
*** Sample ID: 4de7 dup				Seq: 232	21:01:56 13 Dec 1999 HG			
Hg	.065	ug/L	.000	.065				
*** Sample ID: 4de8				Seq: 233	21:04:14 13 Dec 1999 HG			
Hg	.033	ug/L	.000	.033				
*** Sample ID: 4de8 dup				Seq: 234	21:06:32 13 Dec 1999 HG			
Hg	.032	ug/L	.000	.032				
*** Sample ID: rbde9				Seq: 235	21:08:50 13 Dec 1999 HG			
Hg	.016	ug/L	.000	.016				
*** Sample ID: rode9 dup				Seq: 236	21:11:08 13 Dec 1999 HG			
Hg	.016	ug/L	.000	.016				
*** Sample ID: ccb				Seq: 237	21:13:26 13 Dec 1999 HG			
Hg	-.006	ug/L	.000	-.006				

NO DATA

<0.20 µg/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: ccv				Seq: 238	21:15:45 13 Dec 1999 HG				
Hg	1.89	ug/L	.000	1.89					TV=2.00 95%
*** Sample ID: rbde7				Seq: 239	21:18:16 13 Dec 1999 HG				
Hg	=.020	ug/L	.000	=.020					
*** Sample ID: rbde7 dup				Seq: 240	21:20:35 13 Dec 1999 HG				
Hg	=.005	ug/L	.000	=.006					NO DATA
*** Sample ID: rbde11				Seq: 241	21:22:54 13 Dec 1999 HG				
Hg	.005	ug/L	.000	.005					
*** Sample ID: rbde11 dup				Seq: 242	21:25:13 13 Dec 1999 HG				
Hg	.004	ug/L	.000	.004					
*** Sample ID: 4ffblk				Seq: 243	21:27:32 13 Dec 1999 HG				
Hg	.006	ug/L	.000	.006					<0.200 µg/L
*** Sample ID: 4ffblk dup				Seq: 244	21:29:51 13 Dec 1999 HG				RPD=<1.0%
Hg	.007	ug/L	.000	.007					<0.200 µg/L
*** Sample ID: 4ff1				Seq: 245	21:32:10 13 Dec 1999 HG				RPD=<1.0%
Hg	.023	ug/L	.000	.023					<0.640 µg
*** Sample ID: 4ff1 dup				Seq: 246	21:34:29 13 Dec 1999 HG				
Hg	.023	ug/L	.000	.023					<0.640 µg
*** Sample ID: 4ff2				Seq: 247	21:36:49 13 Dec 1999 HG				
Hg	.023	ug/L	.000	.023					<0.640 µg
*** Sample ID: 4ff2 dup				Seq: 248	21:39:09 13 Dec 1999 HG				RPD=<1.0%
Hg	.022	ug/L	.000	.022					<0.640 µg
*** Sample ID: 4ff3				Seq: 249	21:41:29 13 Dec 1999 HG				
Hg	.332	ug/L	.000	.332					1.26 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 4ff3 dup				Seq: 250	21:43:49 13 Dec 1999 HG				RPD = <1.0%
Hg	.329	ug/L	.000	.329					1.25 µg
*** Sample ID: 4ff3 trp				Seq: 251	21:46:09 13 Dec 1999 HG				RPD = <1.0%
Hg	.330	ug/L	.000	.330					1.25 µg
*** Sample ID: 4ff4				Seq: 252	21:48:30 13 Dec 1999 HG				
Hg	.137	ug/L	.000	.137					<0.820 µg
*** Sample ID: 4ff4 dup				Seq: 253	21:50:51 13 Dec 1999 HG				RPD = <1.0%
Hg	.134	ug/L	.000	.134					<0.820 µg
*** Sample ID: 4ff4 spk				Seq: 254	21:53:12 13 Dec 1999 HG				TV = 1.0
Hg	1.17	ug/L	.000	1.17					117%
*** Sample ID: 4ff5				Seq: 255	21:55:34 13 Dec 1999 HG				
Hg	.571	ug/L	.000	.571					1.60 µg
*** Sample ID: 4ff5 dup				Seq: 256	21:57:56 13 Dec 1999 HG				RPD = <1.0%
Hg	.575	ug/L	.000	.575					1.61 µg
*** Sample ID: 4ff6				Seq: 257	22:00:17 13 Dec 1999 HG				
Hg	.266	ug/L	.000	.266					1.09 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ccc				Seq: 258	22:09:00 13 Dec 1999 HG			
Hg	-.005	ug/L	.000	-.005				
*** Sample ID: 4ff: dup				Seq: 259	22:11:17 13 Dec 1999 HG			
Hg	.261	ug/L	.000	.261				
*** Sample ID: ccc				Seq: 260	22:13:35 13 Dec 1999 HG			
Hg	-.005	ug/L	.000	-.005				
*** Sample ID: ccv				Seq: 261	22:15:52 13 Dec 1999 HG			
Hg	1.88	ug/L	.000	1.88				
*** Sample ID: 4***				Seq: 262	22:18:21 13 Dec 1999 HG			
Hg	.546	ug/L	.000	.546				
*** Sample ID: 4*** dup				Seq: 263	22:20:39 13 Dec 1999 HG			
Hg	.566	ug/L	.000	.566				
*** Sample ID: 4*** ms				Seq: 264	22:22:57 13 Dec 1999 HG			
Hg	.573	ug/L	.000	.573				
*** Sample ID: 4ff5				Seq: 265	22:25:15 13 Dec 1999 HG			
Hg	.477	ug/L	.000	.477				
*** Sample ID: 4***3 d.s				Seq: 266	22:27:34 13 Dec 1999 HG			
Hg	.489	ug/L	.000	.489				
*** Sample ID: 4ff3 ec.				Seq: 267	22:29:52 13 Dec 1999 HG			
Hg	1.50	ug/L	.000	1.50				
*** Sample ID: mff**				Seq: 268	22:32:10 13 Dec 1999 HG			
Hg	.021	ug/L	.000	.021				
*** Sample ID: mff5 dup				Seq: 269	22:34:29 13 Dec 1999 HG			
Hg	.025	ug/L	.000	.025				

<20.200 µg/L

RPD = 1.9%

1.07 µg

<20.200 µg/L

TV = 2.00

94%

1.26 µg

RPD = 3.6%

1.30 µg

RPD = 4.7%

1.32 µg

1.19 µg

RPD = <1.0%

1.20 µg

TV = 1.0

102%

<4.0 µg/L

<4.0 µg/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: roff7				Sec:	270	22:36:46 13 Dec 1999 HG			
Hg	-.005	ug/L	.000	-.005					<0.2 ug/L
*** Sample ID: roff7 dup				Sec:	271	22:39:03 13 Dec 1999 HG			RPD=<1.0%
Hg	-.004	ug/L	.000	-.004					<0.20 ug/L
*** Sample ID: roff11				Sec:	272	22:41:21 13 Dec 1999 HG			
Hg	-.000	ug/L	.000	-.000					<0.20 ug/L
*** Sample ID: roff11dup				Sec:	273	22:43:39 13 Dec 1999 HG			RPD=<1.0%
Hg	-.003	ug/L	.000	-.003					<0.200 ug/L
*** Sample ID: ccb				Sec:	274	22:45:57 13 Dec 1999 HG			
Hg	-.005	ug/L	.000	-.005					<0.20 ug/L
*** Sample ID: ccv				Sec:	275	22:48:15 13 Dec 1999 HG			
Hg	1.90	ug/L	.000	1.90					TV=2.0 95%

12/14/99 Analytical Run

Protocol: SYSTEST

Rev: 3.001 Time: 19:51:01 14 Dec 1999

Folder: DEC99B Seq: 349 Print: On

User: Batch: Id: ccv Cup: 1 25 Gas: 0.22 LPM

State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 1214996

Cup	Id	Extended id	Weight	Volume	Macro check	Help
1	icp		1.0000	1.0000		
2	5ffblk		1.0000	1.0000		
3	5ffblkdup		1.0000	1.0000		
4	5ff1		1.0000	1.0000		
5	5ff1 dup		1.0000	1.0000		
6	5ff2		1.0000	1.0000		
7	5ff2 dup		1.0000	1.0000		
8	5ff3	1:10	1.0000	1.0000		
9	5ff3 dup	1:10	1.0000	1.0000		
10	5ff4	1:5	1.0000	1.0000		
11	5ff4 dup	1:5	1.0000	1.0000		
12	5ff5	1:5	1.0000	1.0000		
13	5ff5 dup	1:5	1.0000	1.0000		
14	5ff5 trp	1:5	1.0000	1.0000		
15	5ff6	1:5 ✓	1.0000	1.0000		

Cup 1 ID: icp Cell entry, Ins to switch

129 = 12

Protocol: SYSTEST

Rev: 3.001 Time: 19:51:10 14 Dec 1999

Folder: DEC999 Seq: 349 Print: On

User: Batch: Id: ccv Cup: 1 25 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 121499b Pgup

cup Id	Extended id	Weight	Volume	Macro check	Help
16 5ff6 dup	1:5	1.0000	1.0000		
17 5ff6 spk	1:5	1.0000	1.0000		
18 5ff7	1:10	1.0000	1.0000		
19 5ff7 dup	1:10	1.0000	1.0000		
20 5ff8	1:5	1.0000	1.0000		
21 5ff8 dup	1:5	1.0000	1.0000		
22 rcff10		1.0000	1.0000		
23 rcff10dup		1.0000	1.0000		
24 ccb		1.0000	1.0000		
25 ccv		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: 5ff6 dup Call entry, line to switch

Protocol: SYSTEST

Rev: 3.001 Time: 18:44:05 14 Dec 1999

Folder: DEC99B Seq: 323 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 29 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

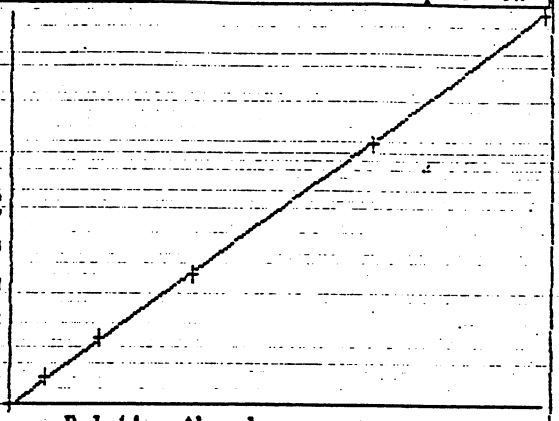
CALIBRATION: Line Calibration

Line: Hg — Accepted

	Conc.	Calc.	Dev.	
S1	.000	-.007	-.007	LiNear
S2	.200	.198	-.002	Quadratic
S3	.500	.499	-.001	WtdLinear
S4	1.00	1.01	.009	C
S5	2.00	2.01	.011	Accept o
S6	3.00	2.99	-.010	n
				StdAdd c

A .0000000 r .999973

B 1.96985e-5 C -9.52672e-3



Relative Absorbance

	Mean	%RSD	
S1	131	0	131
S2	10518	0	10518
S3	25827	0	25827
S4	51720	0	51720
S5	102580	0	102580
S6	152254	0	152254

33?

New calibration coefficients stored 149 2 5

*** Standard: 1 Rep: 1 Seq: 316 18:29:09 14 Dec 1999 HG

Hg .000 ug/L 131
Ave. Int. = 131 S. D. = 0

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

*** Standard: 2 Rep: 1 Seq: 317 18:31:31 14 Dec 1999 HG

Hg .200 ug/L 10518
Ave. Int. = 10518 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 318 18:33:53 14 Dec 1999 HG

Hg .500 ug/L 25827
Ave. Int. = 25827 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 319 18:36:15 14 Dec 1999 HG

Hg 1.00 ug/L -98
Ave. Int. = -98 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 320 18:38:38 14 Dec 1999 HG

Hg 2.00 ug/L 102580
Ave. Int. = 102580 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 321 18:41:04 14 Dec 1999 HG

Hg 1.00 ug/L 51720
Ave. Int. = 51720 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 322 18:43:28 14 Dec 1999 HG

Hg 3.00 ug/L 152254
Ave. Int. = 152254 S. D. = 0

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

*** Check Standard: 2 Ck2 Seq: 323 18:48:02 14 Dec 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	.616	.604	ug/L	.000

*** Sample ID: icb Seq: 324 18:50:22 14 Dec 1999 HG

Hg	-.016	ug/L	.000	-.016		

*** Sample ID: 5deblk Seq: 325 18:52:39 14 Dec 1999 HG

Hg	-.007	ug/L	.000	-.007		

*** Sample ID: 5deblkdup Seq: 326 18:54:57 14 Dec 1999 HG

Hg	-.009	ug/L	.000	-.009		

*** Sample ID: 5de1 Seq: 327 18:57:15 14 Dec 1999 HG

Hg	.021	ug/L	.000	.021		

*** Sample ID: 5de1 dup Seq: 328 18:59:33 14 Dec 1999 HG

Hg	.018	ug/L	.000	.018		

*** Sample ID: 5de2 Seq: 329 19:01:51 14 Dec 1999 HG

Hg	.037	ug/L	.000	.037		

*** Sample ID: 5de2 dup Seq: 330 19:04:09 14 Dec 1999 HG

Hg	.036	ug/L	.000	.036		

*** Sample ID: 5de3 Seq: 331 19:06:27 14 Dec 1999 HG

Hg	.880	ug/L	.000	.880		

*** Sample ID: 5de3 dup Seq: 332 19:08:46 14 Dec 1999 HG

Hg	.885	ug/L	.000	.885		

*** Sample ID: 5de4 Seq: 333 19:11:05 14 Dec 1999 HG

Hg	.509	ug/L	.000	.509		

*** Sample ID: 5de4 dup Seq: 334 19:13:24 14 Dec 1999 HG

Hg	.509	ug/L	.000	.509		

<0.200 ug/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 1cb				Sec:	349	19:53:32	14 Dec 1999	HG	
Hg	-.009	ug/L	.000	-.009					<0.200 ug/L
*** Sample ID: 5ffblk				Sec:	350	19:55:50	14 Dec 1999	HG	
Hg	-.009	ug/L	.000	-.009					<0.200 ug/L
*** Sample ID: 5ffblk dup				Sec:	351	19:58:09	14 Dec 1999	HG	RPD=<1.0%
Hg	-.009	ug/L	.000	-.009					<0.200 ug/L
*** Sample ID: 5ff1				Sec:	352	20:00:37	14 Dec 1999	HG	
Hg	.010	ug/L	.000	.010					<0.890 ug
*** Sample ID: 5ff1 dup				Sec:	353	20:02:45	14 Dec 1999	HG	RPD=<1.0%
Hg	.008	ug/L	.000	.008					<0.890 ug
*** Sample ID: 5ff2				Sec:	354	20:05:03	14 Dec 1999	HG	
Hg	.003	ug/L	.000	.003					<1.00 ug
*** Sample ID: 5ff2 dup				Sec:	355	20:07:21	14 Dec 1999	HG	RPD=<1.0%
Hg	.004	ug/L	.000	.004					<1.00 ug
*** Sample ID: 5ff3				Sec:	356	20:09:39	14 Dec 1999	HG	
Hg	8.06	ug/L	.000	8.06					NO DATA
*** Sample ID: 5ff3 dup				Sec:	357	20:12:15	14 Dec 1999	HG	
Hg	8.04	ug/L	.000	8.04					NO DATA
*** Sample ID: 5ff4				Sec:	358	20:14:57	14 Dec 1999	HG	
Hg	7.55	ug/L	.000	7.55					NO DATA
*** Sample ID: 5ff4 dup				Sec:	359	20:17:39	14 Dec 1999	HG	
Hg	7.36	ug/L	.000	7.36					NO DATA
*** Sample ID: 5ff5				Sec:	360	20:20:17	14 Dec 1999	HG	
Hg	6.94	ug/L	.000	6.94					NO DATA

Line	Conc.	Units	SD/REP	1	2	3	4	5	
*** Sample ID: 5ff5 dup					Sec: 361	20:32:15 14 Dec 1999			
Hg	8.84	ug/L	.000	8.84					NO DATA
*** Sample ID: 5ff5 trp					Sec: 362	20:35:54 14 Dec 1999			
Hg	8.83	ug/L	.000	8.83					NO DATA
*** Sample ID: 5ff6					Sec: 363	20:39:33 14 Dec 1999			
Hg	5.80	ug/L	.000	5.80					NO DATA
*** Sample ID: 5ff6	1:5				Sec: 364	20:52:01 14 Dec 1999			
Hg	1.16	ug/L	.000	1.16					33.06 µg
*** Sample ID: 5ff6 dup	1:5				Sec: 365	20:54:20 14 Dec 1999			RPD = 1.7%
Hg	1.18	ug/L	.000	1.18					33.63 µg
*** Sample ID: 5ff6 spk	1:5				Sec: 366	20:56:38 14 Dec 1999			TV = 1.0
Hg	2.13	ug/L	.000	2.13					97%
*** Sample ID: 5ff7					Sec: 367	20:59:06 14 Dec 1999			
Hg	9.00	ug/L	.000	9.00					NO DATA
*** Sample ID: 5ff7 dup					Sec: 368	21:41:44 14 Dec 1999			
Hg	9.09	ug/L	.000	9.09					NO DATA
*** Sample ID: 5ff8					Sec: 369	20:44:20 14 Dec 1999			
Hg	6.50	ug/L	.000	6.50					NO DATA
*** Sample ID: 5ff8 dup					Sec: 370	20:47:02 14 Dec 1999			
Hg	6.52	ug/L	.000	6.52					NO DATA
*** Sample ID: mdff10					Sec: 371	20:49:41 14 Dec 1999			
Hg	-.013	ug/L	.000	-.013					< 20 ng/L
*** Sample ID: mdff10dup					Sec: 372	20:51:59 14 Dec 1999			RPD = 21.0%
Hg	.003	ug/L	.000	.003					< 20 ng/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 5ff7			1:10		Seq: 385	21:35:18 14 Dec 1999 HG		
Hg	.911	ug/L	.000	.911				
*** Sample ID: 5ff7 DUP			1:10		Seq: 386	21:37:32 14 Dec 1999 HG		
Hg	.888	ug/L	.000	.888				
*** Sample ID: 5ff8			1:5		Seq: 387	21:39:55 14 Dec 1999 HG		
Hg	1.31	ug/L	.000	1.31				
*** Sample ID: 5ff8 DUP			1:5		Seq: 388	21:43:18 14 Dec 1999 HG		
Hg	1.28	ug/L	.000	1.28				
*** Sample ID: BLK					Seq: 389	21:44:29 14 Dec 1999 HG		
Hg	-.011	ug/L	.000	-.011				
*** Sample ID: ICV					Seq: 390	21:46:46 14 Dec 1999 HG		
Hg	1.94	ug/L	.000	1.94				

36.44 µg

RPD = 2.6%

35.52 µg

26.20 µg

RPD = 2.3%

25.60 µg

< 0.200 µg/L

TV = 2.0

97%

12/24/99 Analytical Run

Protocol: SYSTEST

Rev: 3.001 Time: 15:54:49 24 Dec 1999

Folder: DEC99C Seq: 298 Print: On

User: Batch: Id: StoPeol Cup: 1 29 Gas: [illegible]

State: Idle Init: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 1224994

Cup Id	Extended Id	Weight	Volume	Macro check help
1 icp		1.0000	1.0000	
2 blk		1.0000	1.0000	
3 blk dup		1.0000	1.0000	
4 hist 1633b		1.0000	1.0000	
5 hist dup		1.0000	1.0000	
6 47Q114		1.0000	1.0000	
7 47Q114 dup		1.0000	1.0000	
8 47Q114 trp		1.0000	1.0000	
9 47Q106		1.0000	1.0000	
10 47Q106 dup		1.0000	1.0000	
11 47Q106 spk		1.0000	1.0000	
12 47Q112		1.0000	1.0000	
13 47Q112 dup		1.0000	1.0000	
14 47Q110		1.0000	1.0000	
15 47Q110 dup		1.0000	1.0000	

PgDn

Cup 1 ID: icp Cell entry. Ins to switch

[illegible]

Protocol: SYSTEST

Rev: 3.001 Time: 15:54:52 24 Dec 1999

Folder: DEC99C Seq: 299 Print: On

User: Batch: Id: StdRep1 Cup: 1 29 Gas: 0.20 LPM

State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 1224994 Pgup

cup Id	Extended id	weight	Volume	Macro check	Help
16 47Q105		1.0000	1.0000		
17 47Q105 dup		1.0000	1.0000		
18 47Q107		1.0000	1.0000		
19 47Q107 dup		1.0000	1.0000		
20 Q77 (1-3)	Repeat RPD out	1.0000	1.0000		
21 Q77 dup		1.0000	1.0000		
22 ccb		1.0000	1.0000		
23 ccv		1.0000	1.0000		
24 clx		1.0000	1.0000		
25 clx dup		1.0000	1.0000		
26 nist 1633b		1.0000	1.0000		
27 nist dup		1.0000	1.0000		
28 Q58(1-3)	1:10	1.0000	1.0000		
29 Q58 dup	1:10	1.0000	1.0000		
30 Q59 (1-3)	1:5	1.0000	1.0000		

Pgdn

Cup 16 ID: 47Q105 Call entry. Ins to switch

[illegible]

Protocol: SYSTEST

Rev: 2.001 Time: 15:54:54 24 Dec 1999

Folder: DEC99C Seq: 298 Print: On

User: Batch: Id: StdPeol Cyc: 1 29 Gas: 0.22 LPM

State: Idle Unit: OFF Autosampler: On

AUTOSAMPLER: Rack entry Rack 1224994 Pgup

Cup Id	Extended id	Weight	Volume	Macro check	Help
31 059 dup 1:5		1.0000	1.0000		
32 059 trp 1:5		1.0000	1.0000		
33 061 (1-3)		1.0000	1.0000		
34 061 dup		1.0000	1.0000		
35 061 sck		1.0000	1.0000		
36 47Q111		1.0000	1.0000		
37 47Q111 dup		1.0000	1.0000		
38 ccp		1.0000	1.0000		
39 ccv		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: 059 dup Cell entry, Ins to switch

[illegible]

*** Standard: 1 Rep: 1 Sec: 253 15:25:21 24 Dec 1999 HG

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

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

*** Standard: 2 Rep: 1 Sec: 253 15:37:42 24 Dec 1999 HG

Hg .000 ug/L 8051
Ave. Int. = 8051 S. D. = 0

*** Standard: 3 Rep: 1 Sec: 254 15:40:39 24 Dec 1999 HG

Hg .500 ug/L 20347
Ave. Int. = 20347 S. D. = 0

*** Standard: 4 Rep: 1 Sec: 255 15:43:37 24 Dec 1999 HG

Hg 1.00 ug/L 40125
Ave. Int. = 40125 S. D. = 0

*** Standard: 5 Rep: 1 Sec: 256 15:44:54 24 Dec 1999 HG

Hg 2.00 ug/L 81925
Ave. Int. = 81925 S. D. = 0

*** Standard: 6 Rep: 1 Sec: 257 15:47:22 24 Dec 1999 HG

Hg 3.00 ug/L 120644
Ave. Int. = 120644 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 15:48:16 24 Dec 1999

Folder: DEC99C Seq: 298 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 29 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

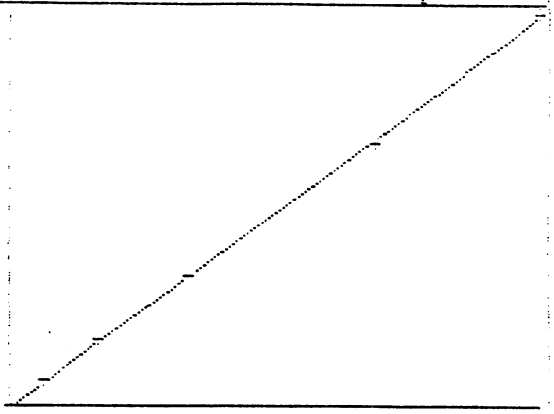
	Conc.	Calc.	Dev.	Accepted LiNear
S1	.000	-.001	-.001	Quadratic
S2	.200	.195	-.005	UtdLinear
S3	.500	.501	.001	
S4	1.00	.993	-.007	Accept
S5	2.00	2.03	.032	
S6	3.00	2.98	-.019	StdAdd

A .0000000 r .999889

B 2.48732e-5 C -5.41651e-3

	Mean	%RSD	
S1	172	0	172
S2	6851	0	6851
S3	28347	0	28347
S4	40126	0	40126
S5	81928	0	81928
S6	120849	0	120849

Concentration



Relative Absorbance

New calibration coefficients stored 149 2 5

Folsom, [illegible]
Portland, Oregon

Page [illegible]

Lab Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Surrogate Recoveries

Lab Sample ID	Client Sample ID	Matrix	TBP	2FP	PHL	2FBP	TBA	NBZ	FBP	DCB
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Method Blank Summary

Lab Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Laboratory Control Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

< 0.200 µg/L

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

< 0.200 µg/L

Sample ID: [illegible] DUP

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RPD = < 1.0%

< 0.200 µg/L

Sample ID: [illegible] MS

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TV = 0.141

0.138 µg/g 98%

Sample ID: [illegible] MSD

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RPD = 1.3%

TV = 0.141

0.135 µg/g 96%

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

0.020 µg

Sample ID: [illegible] DUP

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RPD = 2.5%

0.020 µg

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RPD = 3.7%

0.020 µg

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

0.013 µg

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RPD = < 1.0%

0.013 µg

Sample ID: [illegible]

Analyte	Result	Units	Flag	MDL	RL	Dilution Factor	Date Analyzed
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TV = 1.0

97%

0.020 µg

0.021 µg

0.013 µg

RPD = 1.5%

0.013 µg

0.018 µg

RPD = 2.00%

0.017 µg

< 0.010 µg

RPD = < 1.0%

< 0.010 µg

NO DATA, RPD OUT

NO DATA, RPD OUT

0.152 µg

NO DATA,

Site	Date	Time	Sample					
*** Sample ID: DFF dup			Seq: DDD	16:55:55 24-Dec-****				RPD = 21.0%
Hg	1.0%	ug/L	.000	1.0%				0.150 µg
*** Sample ID: EEE			Seq: EEE	16:56:14 24-Dec-****				
Hg	-.005	ug/L	.000	-.005				<0.200 µg/L
*** Sample ID: ccc			Seq: CC4	16:58:CC 24-Dec-****				
Hg	1.95	ug/L	.000	1.95				TV = 2.0 99%
*** Sample ID: cix			Seq: CCC	17:04:57 24-Dec-****				
Hg	.110	ug/L	.000	.110				<0.200 µg/L
*** Sample ID: cix dup			Seq: CCC	17:02:16 24-Dec-****				RPD = 21.0%
Hg	.120	ug/L	.000	.120				<0.200 µg/L
*** Sample ID: fiet 1422			Seq: DDT	17:06:26 24-Dec-****				
Hg	1.**	ug/L	.000	1.**				TV = 0.141 108%
								0.152 µg/g
*** Sample ID: fiet dup			Seq: DDS	17:08:44 24-Dec-****				RPD = 2.9%
Hg	1.72	ug/L	.000	1.72				TV = 0.141 105%
								0.148 µg/g
*** Sample ID: DEE(1:10)			Seq: DDS	17:10:12 24-Dec-****				
Hg	10.5	ug/L	.000	10.5				NO DATA
*** Sample ID: DFF(1:10	1:10		Seq: DDD	17:13:41 24-Dec-****				
Hg	3.02	ug/L	.000	3.02				3.05 µg
*** Sample ID: DFF dup	1:10		Seq: DDD	17:21:12 24-Dec-****				RPD = 3.0%
Hg	2.97	ug/L	.000	2.97				2.96 µg 114100
*** Sample ID: DFF (1:5			Seq: DDT	17:22:02 24-Dec-****				
Hg	2.05	ug/L	.000	2.05				NO DATA
*** Sample ID: [illegible]	1:5		Seq: DDS	17:24:** 24-Dec-****				
Hg	.685	ug/L	.000	.685				0.667 µg

17:29:06 24 Dec 1999 Folder: DEC99C Page [illegible]
Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
+++ Sample ID: [illegible]			1:5		Sec: [illegible]	17:29:06 24 Dec 1999			RPD = 3.4%
Hg	.920	ug/L	.000	.920					0.690 µg
+++ Sample ID: [illegible]			1:5		Sec: [illegible]	17:31:29 24 Dec 1999			RPD = 3.5%
Hg	.921	ug/L	.000	.921					0.691 µg
+++ Sample ID: [illegible]					Sec: [illegible]	17:33:46 24 Dec 1999			
Hg	.043	ug/L	.000	.043					<0.030 µg
+++ Sample ID: [illegible]					Sec: [illegible]	17:36:08 24 Dec 1999			RPD = <1.0%
Hg	.048	ug/L	.000	.048					<0.030 µg
+++ Sample ID: [illegible]					Sec: [illegible]	17:38:29 24 Dec 1999			
Hg	1.07	ug/L	.000	1.07					TV = 1.0 107%
+++ Sample ID: [illegible]					Sec: [illegible]	17:40:[illegible] 24 Dec 1999			
Hg	.178	ug/L	.000	.178					<0.010 µg
+++ Sample ID: [illegible]					Sec: [illegible]	[illegible] 24 Dec 1999			RPD = <1.0%
Hg	.182	ug/L	.000	.182					<0.010 µg
+++ Sample ID: [illegible]					Sec: [illegible]	[illegible] 24 Dec 1999			
Hg	-.015	ug/L	.000	-.015					<0.200 µg/L
+++ Sample ID: [illegible]					Sec: [illegible]	[illegible] 24 Dec 1999			
Hg	2.00	ug/L	.000	2.00					TV = 2.0 100%

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA NVLAP [illegible] • NY DOH [illegible] • NJ DEP [illegible]
• AIHA ACCREDITATION NO. [illegible] • PA DER [illegible]

ANALYTICAL REPORT

Client: METCO Environmental

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

Project: 188814
Received: 13-DEC-99
Reported: 07-JAN-00

PURCHASE ORDER: 99-182-09

Project Description: EPRI Project: 99-182/TXU, BBRSES Unit 1
BTU/Ash/Sulfur/Chloride - 3 Runs

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 1, Fuel Sample (Lignite)						
Lab Sample: 1386554						
sampled: 09-DEC-99 13:53 by: TXU						
Moisture, Total	25.0		%	D 3302	17-DEC-99	VJO
Heating Value	6520	8690	BTU/lb	D 3286	21-DEC-99	VJO
Ash	17.8	23.7	%	D 3174	17-DEC-99	VJO
Sulfur	0.76	1.01	%	D 4239	22-DEC-99	VJO
Chloride, Total	0.01	0.01	%	E776/300.0	16-DEC-99	DRK
Run 2, Fuel Sample (Lignite)						
Lab Sample: 1386555						
sampled: 09-DEC-99 18:10 by: TXU						
Moisture, Total	25.5		%	D 3302	17-DEC-99	VJO
Heating Value	6500	8720	BTU/lb	D 3286	21-DEC-99	VJO
Ash	17.1	23.0	%	D 3174	17-DEC-99	VJO
Sulfur	0.77	1.03	%	D 4239	22-DEC-99	VJO
Chloride, Total	0.01	0.01	%	E776/300.0	16-DEC-99	DRK
Run 3, Fuel Sample (Lignite)						
Lab Sample: 1386556						
sampled: 10-DEC-99 11:22 by: TXU						
Moisture, Total	26.1		%	D 3302	17-DEC-99	VJO
Heating Value	6690	9050	BTU/lb	D 3286	21-DEC-99	VJO
Ash	15.5	21.0	%	D 3174	17-DEC-99	VJO
Sulfur	0.74	1.00	%	D 4239	22-DEC-99	VJO

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA NVLAP 101262-0 • NY DOH 10903 • NJ DEP [illegible]
• AIHA ACCREDITATION NO. 100439 • PA DER 36-050

Client: METCO Environmental
Project: 188814

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 3, Fuel Sample (Lignite)						
Lab Sample: 1386556 - continued						
Chloride, Total	0.01	0.02	%	E776/300.0	16-DEC-99	DRK

< Indicates less than the limit of quantitation.

Philip Analytical Services
Quality Assurance Protocol

PAS Sample #: 1386554,1386555,1386556

Client Name: Metco

PAS Project #: 188814

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.	Matrix Spike Recovery	Matrix Spike Dup Conc.	Matrix Spike Dup 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.	Matrix Spike Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD	Spikes Conc.	Found Conc.	Recovery		
1386556-Heating Value					8175	8155	0.24	13370	13350	99		50
1386556-Ash					18.9	19.0	0.52	11.9	11.8	99		0.01
1386556-Sulfur					0.90	0.86	95	1.78	1.83	103		0.01
1386556-Chlorine					0.01	0.02	50	1.98	2.15	109		0.01

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

Philip Analytical Services
Quality Assurance Protocol

PAS Sample #: 1386554,1386555,1386556

Client Name: Metco

PAS Project #: 188814

Job ID :

Units: mg/kg

O1 SUMMARY FORM

Sample # & Parameter	Matrix Spike				Matrix Spike Duplicate				Laboratory Control Sample		
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Matrix Spike Recovery	Matrix Spike Dup Conc.	Matrix Spike Dup Recovery	Precision RPD	Method Blank	Spikes Conc.	Found Conc.	Recovery
1386556-Chloride	113	747	886	103	894	104	1	0.403	10.000	9.752	98

Sample # & Parameter	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Matrix Spike Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD	Spikes Conc.	Found Conc.	Recovery		
1386556-Chloride	113	747	886	103	113	76	39	10.000	9.752	98	0.403	10.0

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

ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Page 1 of 1

188814

o No: 99-182
b Name: TXU
cation: Fairfield, TX
it: BBRSES Unit 1

ollected By/Company
TXU

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	3 Blu HEXCHROME	Hg	SULFUR	ASH	REMARKS (Specific Compounds/Methods)
un 1 uel Sample (Lignite)	11-9-99	1030-1353			X		II				X					X	X	X	X	Analyze according to the ASTM methods: D6414-99 D-3286 D-5016 D-3174 Ship 1 container to TestAmerica & 1 container to EERC
Run 2 Fuel Sample (Lignite)	11-9-99	1450-1810			X		II				X					X	X	X	X	↓
Run 3 Fuel Sample (Lignite)	11-10-99	0805-1122			X		II				X					X	X	X	X	↓
~~Run 1~~ BH101 ~~Fly Ash Sample~~	~~11-9-99~~					X	I													~~Ship to EERC~~
~~Run 2~~ BH101 ~~Fly Ash Sample~~	~~11-9-99~~					X	I													↓
~~Run 3~~ BH101 ~~Fly Ash Sample~~	~~11-10-99~~					X	I													↓

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Paul Terry	12-2-99 1030	Randy Wordell	R Wordell	12-2-99	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	12/3/99 1300	[illegible]	[illegible]	12/9/99 0900	FEDEX

Received for Laboratory By/Signature: [illegible] (@ P.A.S / Rdg) Date/Time 12/13/99, 0910

Send Samples to: METCO Environmental Attn: Bill Hefley
Phone: 972-931-7127 Fax: 972-931-8398

Send to Phillip Analytical DRB 12/9/99

PeakNet AS3500DX - 12169902.AS3

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	WATER	ACIDSCAN	121699	1	1	
50	1	AUTOCAL1	ACIDSCAN	121699	1	1	
50	1	AUTOCAL2	ACIDSCAN	121699	1	1	
50	1	AUTOCAL3	ACIDSCAN	121699	1	1	
50	1	AUTOCAL4	ACIDSCAN	121699	1	1	
50	1	AUTOCAL5	ACIDSCAN	121699	1	1	
50	1	AUTOCAL6	ACIDSCAN	121699	1	1	
50	1	METH BLK	ACIDSCAN	121699	1	1	
50	1	IPC	ACIDSCAN	121699	1	1	
50	1	QCS	ACIDSCAN	121699	1	1	
50	1	LCS	ACIDSCAN	121699	1	1	
50	1	METH BLK	ACIDSCAN	121699	1	1	
50	1	1385389 1:100	ACIDSCAN	121699	1	1	
50	1	1385389 1:100 DUP	ACIDSCAN	121699	1	1	
50	1	1385389 1:100 MS	ACIDSCAN	121699	1	1	
50	1	1385389 1:100 MSD	ACIDSCAN	121699	1	1	
50	1	CL2 CONT 1:50	ACIDSCAN	121699	1	1	
50	1	1386875	ACIDSCAN	121699	1	1	
50	1	1386876	ACIDSCAN	121699	1	1	
50	1	1386877	ACIDSCAN	121699	1	1	
50	1	1386877 DUP	ACIDSCAN	121699	1	1	
50	1	1386877 MS	ACIDSCAN	121699	1	1	
50	1	1386877 MSD	ACIDSCAN	121699	1	1	
50	1	1386554	ACIDSCAN	121699	1	1	
50	1	1386555	ACIDSCAN	121699	1	1	
50	1	1386556	ACIDSCAN	121699	1	1	
50	1	1386556 DUP	ACIDSCAN	121699	1	1	
50	1	1386556 MS	ACIDSCAN	121699	1	1	
50	1	1386556 MSD	ACIDSCAN	121699	1	1	
50	1	METH BLK	ACIDSCAN	121699	1	1	
50	1	IPC	ACIDSCAN	121699	1	1	
50	1	1385477	ACIDSCAN	121699	1	1	
50	1	1385477 DUP	ACIDSCAN	121699	1	1	
50	1	1385477 MS	ACIDSCAN	121699	1	1	
50	1	1385477 MSD	ACIDSCAN	121699	1	1	
50	1	1385478	ACIDSCAN	121699	1	1	
50	1	1385479	ACIDSCAN	121699	1	1	
50	1	1385480	ACIDSCAN	121699	1	1	
50	1	1385481	ACIDSCAN	121699	1	1	
50	1	1385481 DUP	ACIDSCAN	121699	1	1	
50	1	1385481 MS	ACIDSCAN	121699	1	1	
50	1	1385481 MSD	ACIDSCAN	121699	1	1	
50	1	1385482	ACIDSCAN	121699	1	1	
50	1	1385483	ACIDSCAN	121699	1	1	
50	1	1385484	ACIDSCAN	121699	1	1	
50	1	METH BLK	ACIDSCAN	121699	1	1	
50	1	IPC	ACIDSCAN	121699	1	1	
50	1	1385485	ACIDSCAN	121699	1	1	
50	1	1385485 DUP	ACIDSCAN	121699	1	1	
50	1	1385485 MS	ACIDSCAN	121699	1	1	
50	1	1385485 MSD	ACIDSCAN	121699	1	1	
50	1	1385486	ACIDSCAN	121699	1	1	
50	1	1385487	ACIDSCAN	121699	1	1	

3	50	1	1385489	ACIDSCAN	121699	1	1
4	50	1	1385490	ACIDSCAN	121699	1	1
5	50	1	1385491	ACIDSCAN	121699	1	1
6	50	1	1385492	ACIDSCAN	121699	1	1
1	50	1	METH BLK	ACIDSCAN	121699	1	1
2	50	1	IPC	ACIDSCAN	121699	1	1

al s	Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
7	50	1	1385493	ACIDSCAN	121699	1	1	
8	50	1	1385493 DUP	ACIDSCAN	121699	1	1	
9	50	1	1385493 MS	ACIDSCAN	121699	1	1	
0	50	1	1385493 MSD	ACIDSCAN	121699	1	1	
1	50	1	1385494	ACIDSCAN	121699	1	1	
2	50	1	1385495	ACIDSCAN	121699	1	1	
3	50	1	1385496	ACIDSCAN	121699	1	1	
4	50	1	1385497	ACIDSCAN	121699	1	1	
5	50	1	1385498	ACIDSCAN	121699	1	1	
6	50	1	1385499	ACIDSCAN	121699	1	1	
7	50	1	1385500	ACIDSCAN	121699	1	1	
8	50	1	1385501	ACIDSCAN	121699	1	1	
9	50	1	1385502	ACIDSCAN	121699	1	1	
0	50	1	1385503	ACIDSCAN	121699	1	1	
1	50	1	1385504	ACIDSCAN	121699	1	1	
1	50	1	METH BLK	ACIDSCAN	121699	1	1	
2	50	1	IPC	ACIDSCAN	121699	1	1	
0	50	1	WATER	STOP	121699	1	1	

More Run Parameters

ial os	Oven Ctl	Oven Set	Cool Ctl	Cool Set	Cycle Time	Flush Vol	Visc Factor	Prep Visc	Inj Type	Needle Height
40	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
03	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
05	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
06	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
03	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
05	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
06	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
07	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
08	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
09	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
10	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
11	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
12	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
13	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
14	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
15	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
16	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
17	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
18	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
19	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
20	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
21	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
21	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
22	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

188907
188914

PHILIP
ANALYTICAL SERVICES

Client: METCO Env		Test(s): Chloride
Date: 12/16/99	Initials: JRK	Reviewed By:

Standard 1 Concentration: _____ Reading: _____
Standard 2 Concentration: _____ Reading: _____
Standard 3 Concentration: _____ Reading: _____
Standard 4 Concentration: _____ Reading: _____
Spike 1 Spike Amount: _____ Recv'd _____ Recv'y: _____
Spike 2 Spike Amount: _____ Recv'd _____ Recv'y: _____
Cl2 Cont 1:50 3.342 mg/L

PAGE _____ of _____
☐ Call Results
☐ FAX Results
☐ Results Entered

Sample		Chloride mg/L		WEIGHT (KG)		Chloride mg/kg		% Cl⁻	
1386875		3.241		0.0004944		328		0.03	
1386876		3.504		0.0006283		279		0.03	
1386877		2.275		0.0004267		266		0.03	
1386877	DUP	2.482		0.0004076		304		0.03	
1386554		1.051		0.0005451		96		0.01	
1386555		1.319		0.0006616		100		0.01	
1386556		1.520		0.0004693		113		0.01	
1386556	DUP	1.038		0.0006845		76		<0.01	

Comments For Report:

☐ Analysis performed for PHILIP Analytical by our AIHA accredited reference laboratory ☐ Sample results are blank-corrected

Analytical Method:	LLD
EPA 300.0	1.00 mg/L

N/A = not applicable ND = none detected L/A = sample lost to lab accident QNS = quantity not sufficient to test N/R = sample not received by chemist

188814

PHILIP
ANALYTICAL SERVICES

Client: Metco Env		Test(s): Chloride
Date: 12/20/99	Initials: DRK	Reviewed By:

Standard 1 Concentration: _____ Reading: _____
Standard 2 Concentration: _____ Reading: _____
Standard 3 Concentration: _____ Reading: _____
Standard 4 Concentration: _____ Reading: _____
Spike 1 Spike Amount: _____ Recv'd _____ Recv'y: _____
Spike 2 Spike Amount: _____ Recv'd _____ Recv'y: _____
Cl2 Cont 1:50 3.010 mg/L

PAGE _____ of _____
☐ Call Results
☐ FAX Results
☐ Results Entered

Sample			Chloride mg/L
1386554			1.801
1386555			1.019
1386556			<1.00
1386556	DUP		<1.00

Comments For Report:

☐ Analysis performed for PHILIP Analytical by our AIHA accredited reference laboratory ☐ Sample results are blank-corrected

Analytical Method:	LLD
EPA 300.0	1.00 mg/L

A = not applicable ND = none detected L/A = sample lost to lab accident QNS = quantity not sufficient to test N/R = sample not received by chemist

PeakNet AS3500DX - 12229901.AS3

ial os	Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
40	50	1	WATER	ACIDSCAN	122299	1	1	
01	50	1	AUTOCAL1	ACIDSCAN	122299	1	1	
02	50	1	AUTOCAL2	ACIDSCAN	122299	1	1	
03	50	1	AUTOCAL3	ACIDSCAN	122299	1	1	
04	50	1	AUTOCAL4	ACIDSCAN	122299	1	1	
05	50	1	AUTOCAL5	ACIDSCAN	122299	1	1	
06	50	1	AUTOCAL6	ACIDSCAN	122299	1	1	
01	50	1	METH BLK	ACIDSCAN	122299	1	1	
02	50	1	IPC	ACIDSCAN	122299	1	1	
03	50	1	QCS	ACIDSCAN	122299	1	1	
04	50	1	LCS	ACIDSCAN	122299	1	1	
01	50	1	METH BLK	ACIDSCAN	122299	1	1	
05	50	1	1386417	ACIDSCAN	122299	1	1	
06	50	1	1386417 DUP	ACIDSCAN	122299	1	1	
07	50	1	1386417 MS	ACIDSCAN	122299	1	1	
08	50	1	1386417 MSD	ACIDSCAN	122299	1	1	
09	50	1	1386418	ACIDSCAN	122299	1	1	
10	50	1	1386419	ACIDSCAN	122299	1	1	
11	50	1	1386420	ACIDSCAN	122299	1	1	
12	50	1	1386421	ACIDSCAN	122299	1	1	
13	50	1	1386422	ACIDSCAN	122299	1	1	
14	50	1	1386423	ACIDSCAN	122299	1	1	
15	50	1	1386424	ACIDSCAN	122299	1	1	
16	50	1	1386425	ACIDSCAN	122299	1	1	
01	50	1	METH BLK	ACIDSCAN	122299	1	1	
02	50	1	IPC	ACIDSCAN	122299	1	1	
17	50	1	CL2 CONT 1:50]	ACIDSCAN	122299	1	1	
18	50	1	1386554	ACIDSCAN	122299	1	1	
19	50	1	1386555	ACIDSCAN	122299	1	1	
20	50	1	1386556	ACIDSCAN	122299	1	1	
21	50	1	1386556 DUP	ACIDSCAN	122299	1	1	
22	50	1	1386556 MS	ACIDSCAN	122299	1	1	
23	50	1	1386556 MSD	ACIDSCAN	122299	1	1	
24	50	1	1386254	ACIDSCAN	122299	1	1	
25	50	1	1386255	ACIDSCAN	122299	1	1	
26	50	1	1386256	ACIDSCAN	122299	1	1	
27	50	1	1386257	ACIDSCAN	122299	1	1	
28	50	1	1386257 DUP	ACIDSCAN	122299	1	1	
29	50	1	1386257 MS	ACIDSCAN	122299	1	1	
30	50	1	1386257 MSD	ACIDSCAN	122299	1	1	
01	50	1	METH BLK	ACIDSCAN	122299	1	1	
02	50	1	IPC	ACIDSCAN	122299	1	1	
40	50	5	WATER	ACIDSCAN	122299	1	1	
40	50	1	WATER	STOP	122299	1	1	

More Run Parameters

Vial Pos	Oven Ctl	Oven Set	Cool Ctl	Cool Set	Cycle Time	Flush Vol	Visc Factor	Prep Visc	Inj Type	Needle Height
40	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
A01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

Coal/RDF Proximate Analysis

DATE: 12/17/99

Signature: V. O'Neill

CLIENT #	coastal	weston	→	→	→ Kimberly	Metco →	
Laboratory Number	98	1386355	1386356	1386357	1386357 (DUP)	1386436	1386554	1386555
all weights in grams								
% Air-dry Loss		8.51	8.69	8.99		13.2	19.9	17.6
Weight of Crucible and Sample	22.8200	19.2460	22.8577	18.8892	21.1543	20.5404	21.6743	18.3315
Weight of Crucible	21.7927	18.3043	21.9116	17.6769	20.2497	19.3566	20.6159	17.1603
Weight of Sample	1.0273	.9417	.9461	1.2123	.9046	1.1840	1.0584	1.1712
Weight of Crucible and Sample	22.8200	19.2460	22.8577	18.8892	21.1543	20.5404	21.6743	18.3315
Weight after 105 deg. C	22.8141	19.2353	22.8485	18.8799	21.1464	20.5351	21.6069	18.2190
Weight loss (moisture)	.0059	.0107	.0092	.0093	.0079	.0055	.0674	.1125
% Residual Moisture	0.57	1.14 ~~1.4~~	0.97	0.77	0.87	0.46	6.37	9.60
Weight of Crucible and Sample	21.0957					22.1965		
Weight of Crucible ①	20.4999					② 21.1253		
Weight of Sample	.5958					1.0712		
Weight of Crucible and Sample	21.0957					22.1965		
Weight after 950 deg. C for 7 min.	20.9440					22.1136		
Weight loss (Volatiles)	.1517					.0829		
% Volatiles	25.46					7.74		
% Residual Moisture	.57					.46		
% Volatile Matter	24.9					7.28		
Weight after 750 deg. C	21.9143	18.4073	22.0113	17.7993	20.3408	19.7396	20.8505	17.4036
Weight of Crucible	21.7927	18.3043	21.9116	17.6769	20.2497	19.3566	20.6159	17.1603
Weight of Ash	.1216	.1030	.0997	.1224	.0911	.3830	.2346	.2433
% Ash	11.8	10.9	10.5	10.1	10.1	32.3	22.2	20.8
% Sulfur		3.12	3.19	3.05		1.92	0.95	0.94
BTU per pound		12658	12735	12953		9295	8163	7908
BTU sulfur correction		72	73	70		44	22	22
BTU per pound, corrected		12586	12662	12883		9251	8141	7886
BTU per pound, Moisture Ash Free								

Coal/RDF Proximate Analysis

DATE: 12/17/99

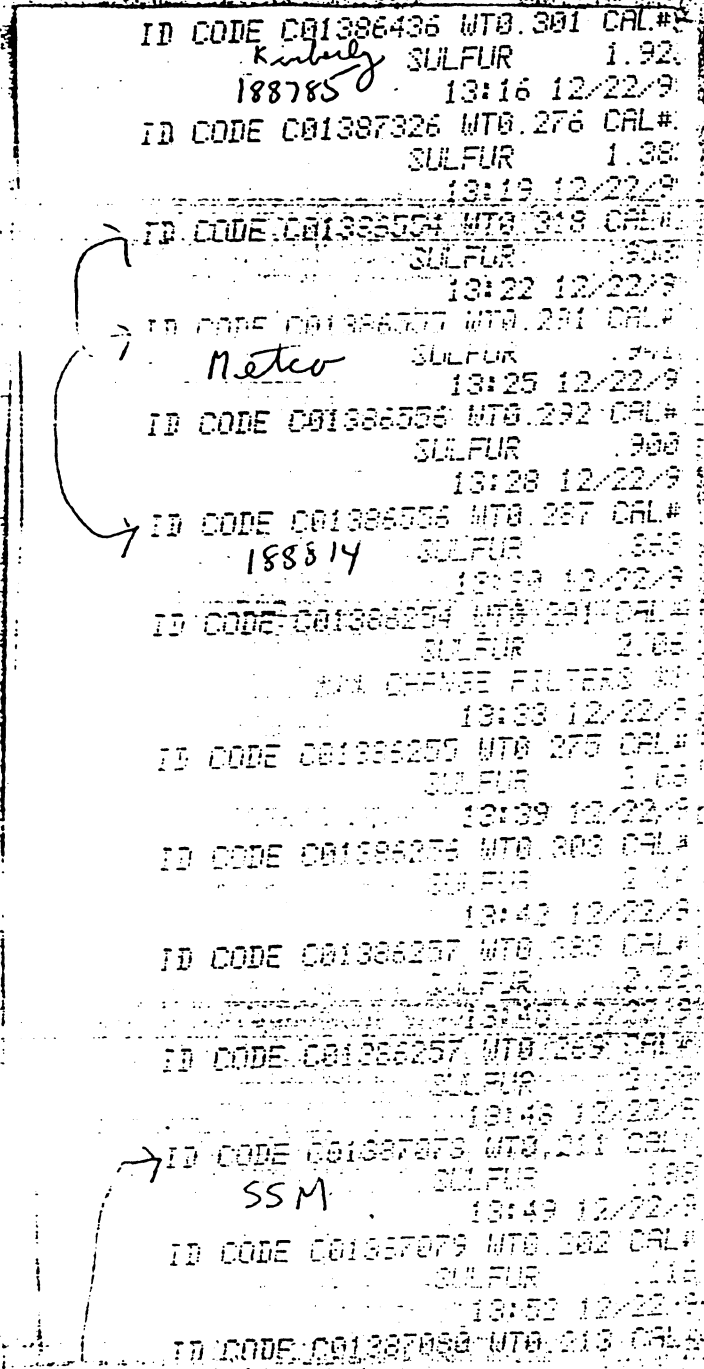
Signature: V. O'Neill

CLIENT	Metco →		Penobscot →		→	Ridgewood →		
Laboratory Number	1386556	1386556 (Dup)	1386126	1386127	1386128	1386510	1386511	1386512
all weights in grams								
% Air-dry Loss	17.9					TM=32.6	TM=37.6	TM=37.1
Weight of Crucible and Sample	21.2688	22.4425	18.8674	18.3235	~~21.4788~~	21.9193	21.7883	21.4856
Weight of Crucible	20.2205	21.3949	18.2663	17.8551	~~19.8589~~	21.1673	20.4825	20.6354
Weight of Sample	1.0483	1.0476	.6011			.7520	1.3058	.8502
Weight of Crucible and Sample	21.2688	22.4425		22.0995	18.3646			
Weight after 105 deg. C	21.1637	22.3353		19.8588	17.8548			
Weight loss (moisture)	.1051	.1072		2.2407	.5098			
% Residual Moisture	10.0	10.2						
Weight of Crucible and Sample						20.9438	21.8027	20.9810
Weight of Crucible						③ 20.5488	④ 21.3352	⑤ 20.7643
Weight of Sample						.3950	.4675	.2167
Weight of Crucible and Sample						20.9438	21.8027	20.9810
Weight after 950 deg. C for 7 min.						20.6196	21.4100	20.8008
Weight loss (Volatiles)						.3242	.3927	.1802
% Volatiles						82.1	84.0	83.2
% Residual Moisture								
% Volatile Matter						82.1	84.0	83.2
Weight after 750 deg. C	20.4183	21.5935	18.3877	21.1353	17.9011	21.2224	20.5303	20.6497
Weight of Crucible	20.2205	21.3949	18.2663	19.8588	17.8548	21.1673	20.4825	20.6354
Weight of Ash	.1978	.1986	.1014	1.2765	.0463	.0551	.0478	.0280
% Ash	18.9	19.0	16.9	56.9	9.08	4.66	3.66	3.41
% Sulfur 0.90	~~0.84~~					0.04	0.04	0.05
BTU per pound	8175		7139	4094	7255	7440	8068	7737
BTU sulfur correction	21							
BTU per pound, corrected	8154							
BTU per pound, Moisture Ash Free								

HLORINE, BOMBING

TITRATION

ATE/ IME	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
21/99	control	50/0.3872	TMD			3.342	mg/l ×50	× 50/0.3872	×.0001				
							=	2.15% chlorine					
	1386554 ~~18884~~ 188814	~~50/0.387~~ 50/0.4375				1.051	× 50/0.4375	×.0001					
								= 0.01 % Chlorine					
	1386555	50/0.4499				1.319	× 50/0.4499	×0.001					
								= 0.01 % chlorine					
	1386556	50/0.4277				1.520	× 50/0.4277	×0.0001					
								= 0.02 % chlorine					
	Dup 1386556	50/0.4653				1.038	× 50/0.4653	×0.0001					
								= 0.01 % Chlorine					


ID CODE C01386436 WT0.301 CAL#
Kimberly
SULFUR 1.92
188785
13:16 12/22/9
ID CODE C01387326 WT0.276 CAL#
SULFUR 1.38
13:19 12/22/9
ID CODE C01386504 WT0.318 CAL#
SULFUR
13:22 12/22/9
Metco
SULFUR
13:25 12/22/9
ID CODE C01386556 WT0.292 CAL#
SULFUR .900
13:28 12/22/9
ID CODE C01386556 WT0.287 CAL#
188814
SULFUR
13:30 12/22/9
ID CODE C01386254 WT0.291 CAL#
SULFUR 2.05
CHANGE FILTERS
13:33 12/22/9
ID CODE C01386250 WT0.275 CAL#
SULFUR 1.66
13:39 12/22/9
ID CODE C01386276 WT0.303 CAL#
13:42 12/22/9
ID CODE C01386257 WT0.283 CAL#
2.23
ID CODE C01386257 WT0.269 CAL#
13:46 12/22/9
ID CODE C01387273 WT0.211 CAL#
SSM
SULFUR
13:49 12/22/9
ID CODE C01387079 WT0.282 CAL#
SULFUR
13:52 12/22/9
ID CODE C01387050 WT0.213 CAL#

Date	Lab No.	Client	BTU/LBS	BTU/LBS Sulfur	BTU/Gal.	Remarks	Operator
12/14/99	1385206	Rdg. Hosp.	19362			185516	
	1385207	"	19260			"	
	1385208	"	19403			"	
	1385209	"	19301			"	
	1385872	Aroostook	1964			188663	
	1385919	APCC	18445		151,120	188644	
	1385922	"	18296		147,220	188646	
	1385923	"	18294		149,890	"	
	1386510	Ridgewood	7445			188805	
	1386511	"	8068			"	
	1386512	"	7737			"	
Dup.	1385919	APCC	18481			185664	
	1385714	Pan Labs	4210			188620	
	1385715	"	6772			"	
	1385716	"	6735			"	
	1385717	"	19219			"	
	1385718	"	19045			"	
	1385719	"	19148			"	
Dup.	1385719	"	19294			"	
	1386554	Metco	8163			188814	
	~~1386555~~	"				"	
	~~1386556~~	"				"	
Dup.	~~1386556~~	"				"	
12/15/99	1386126	Penobscot	7139			188717	
	1386127	"	4094			"	
	1386128	"	7255			"	
	1386355	Wiston	12658			188757	
	1386356	"	12735			"	
	1386357	"	12953			"	
Dup.	1386357	"	12902			"	
	1386436	Kimberly Clark	9295			188785	
	1386609	Maine Env.	14999			188826	
	1386802	Ryegate	8130			188788	
	1386803	"	8229			"	
	1386555	Metco	7908			188814	
	1386556	"	8175			"	
Dup.	1386556	"	8155			"	
	1386906	Penobscot	7557			188916	
	1386907	"	6372			"	
	1386908	"	9405			"	
	1387323	US Nels	13771			189026	
	1387324	"	13920			"	
	1387325	"	13986			"	
	1386244	Westc	15684			188738	

^ 1/6/00 + page 1

Metco
188814
#1386554

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	19.90	19.90	****
MOISTURE:	%	6.37	5.10	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	57.22	76.29
ASH:	%	22.20	17.78	23.71
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB 12/21/99	8141	6520	8690
SULFUR:	% 12/22/99	0.95	0.76	1.01
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.57	-0.76
HYDROGEN INCL WATER:	%	0.00	2.23	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	57.03	76.04
OXYGEN INCL WATER:	%	76.85	79.23	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

> 250

^ 1/6/00 + page 1

Mitw 188814 #1386555

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	17.60	17.60	****
MOISTURE:	%	9.60	7.91	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	57.35	76.99
ASH:	%	20.80	17.14	23.01
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	7886	6500	8720
SULFUR:	%	0.94	0.77	1.04
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.89	-1.19
HYDROGEN INCL WATER:	%	0.00	1.97	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	57.46	77.14
OXYGEN INCL WATER:	%	78.26	30.12	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

25.5

^ 1/6/00 + page 1

Metso
188814
#1386556

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	17.90	17.90	****
MOISTURE:	%	10.00	8.21 > 26.1	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	58.37	79.00
ASH:	%	18.90	15.52	21.00
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	8154	6690	9060
SULFUR:	%	0.90	0.74	1.00
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.92	-1.24
HYDROGEN INCL WATER:	%	0.00	2.00	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.00	0.00	0.00
OXYGEN EXCL WATER:	%	****	58.55	79.24
OXYGEN INCL WATER:	%	80.20	31.74	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

TestAmerica
INCORPORATED

Sample ID: Big Brown
TXU Electric
Fairfield, Texas
Coal Samples

Hg Analysis
ASTM D6414-99

Collected On: 11/09/99 for Run 1 and Run 2, 11/10/99 for Run 3 Composite
Collected By: METCO

	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Units	Dry Weight (%)	Flags	Notes
Run 1 Composite	12/20/99	12/21/99	jpp	0.287	0.287	<1.0	ug/g	86.5		
Run 2 Composite	12/20/99	12/21/99	jpp	0.290	0.291	<1.0	ug/g	83.5		
Run 3 Composite	12/20/99	12/21/99	jpp	0.287	0.280	2.7	ug/g	83.4		

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: 12/6/09 Time: 9:30 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 Exceeeded 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

HSRAL# 122194

COALS

NONAQUEOUS MERCURY BATCH SHEET

Analyst: JRP Date: 12/10/09 Water Bath: start mid end

Standard Reference: 65-41-17 12/21/09 temp: _____

ICV Reference: 65-41-18 date: _____

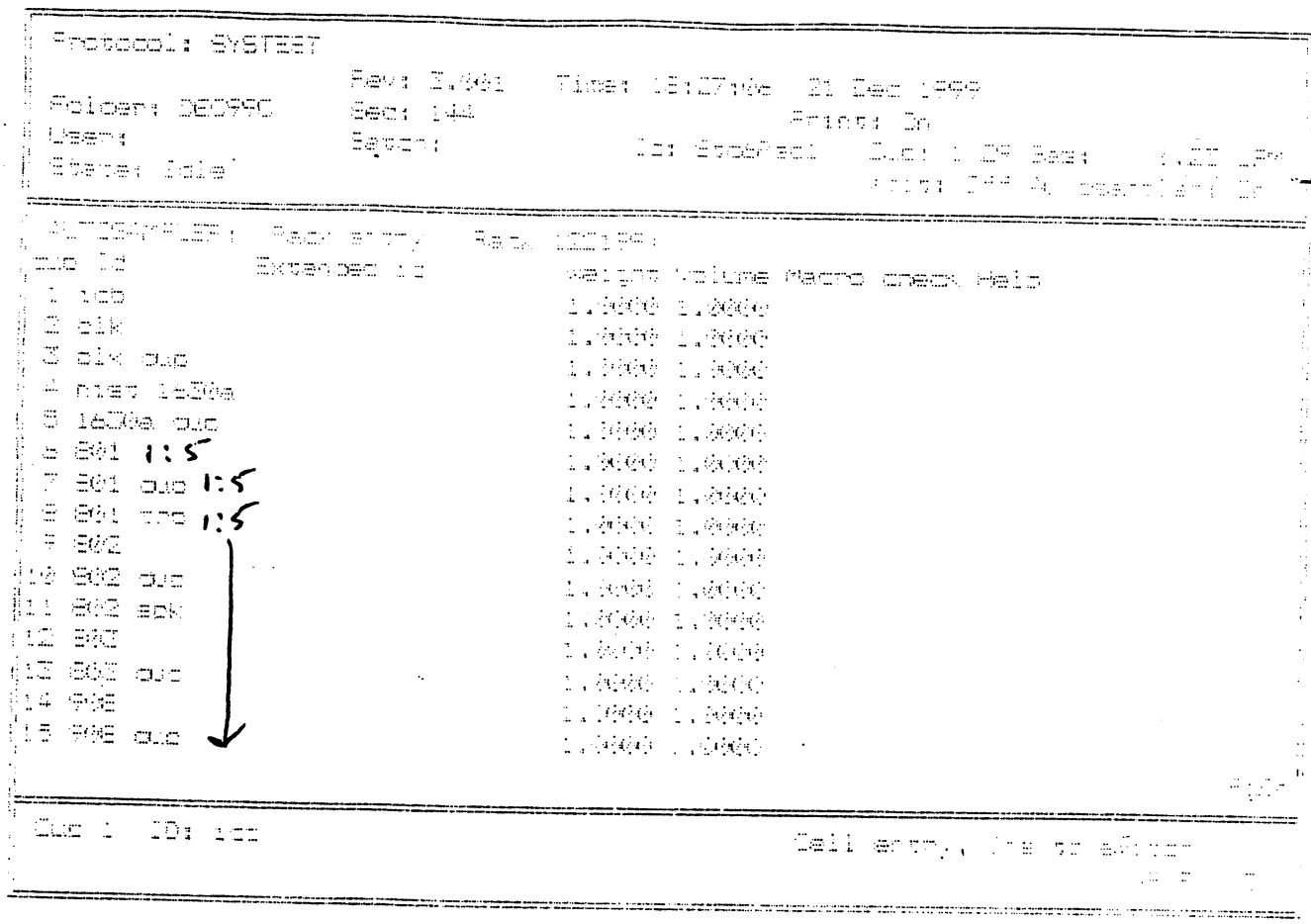
%DW	Sample # / Client	Weight	MS	MSD
95.1	1384801 TRP [redacted]	1.0724 g		
76.7	1384802 SAL	1.0081 g		
76.8	1384803	1.0423 g		MB
84.2	1384908 [redacted]	1.0150 g		
88.2	1384909	1.0678 g		
88.7	1384910	1.0018 g		
95.0 ~~96.5~~	1384787 [redacted]	1.0110 g		ICV
96.5	1384788	1.0059 g		
97.0	1384789	1.0816 g		
100	1384796 [redacted]	1.0090 g		
100	1384797 TRI	1.0203 g		MS
99.9	1384798 SAL	1.0674 g		
92.9	1384774 [redacted]	1.0772 g		
93.8	1384775	1.0734 g		
94.2	1384776	1.0350 g		MSD
86.5	1386554 Big Brown	1.0768 g		
83.5	1386555	1.0290 g		
83.4	1386556	1.0095 g		
	NIST 1630a	1.0044 g		RPD
	Blank			

HNO3 - 65-48-14
HCl - 65-46-1
KMnO4 - 65-33-11
12/21 ~~SnCl2 - 65-50-6~~
NH2OH - 65-50-6
SnCl2 - 65-50-16

SECONDARY DATA CHECK: analyst:
date:

FLAG

Comments: _____



Protocol: SYSTEST

Rev: 3.001 Time: 18:27:06 21 Dec 1999

Folder: DEC99C Sec: 144 Print: On

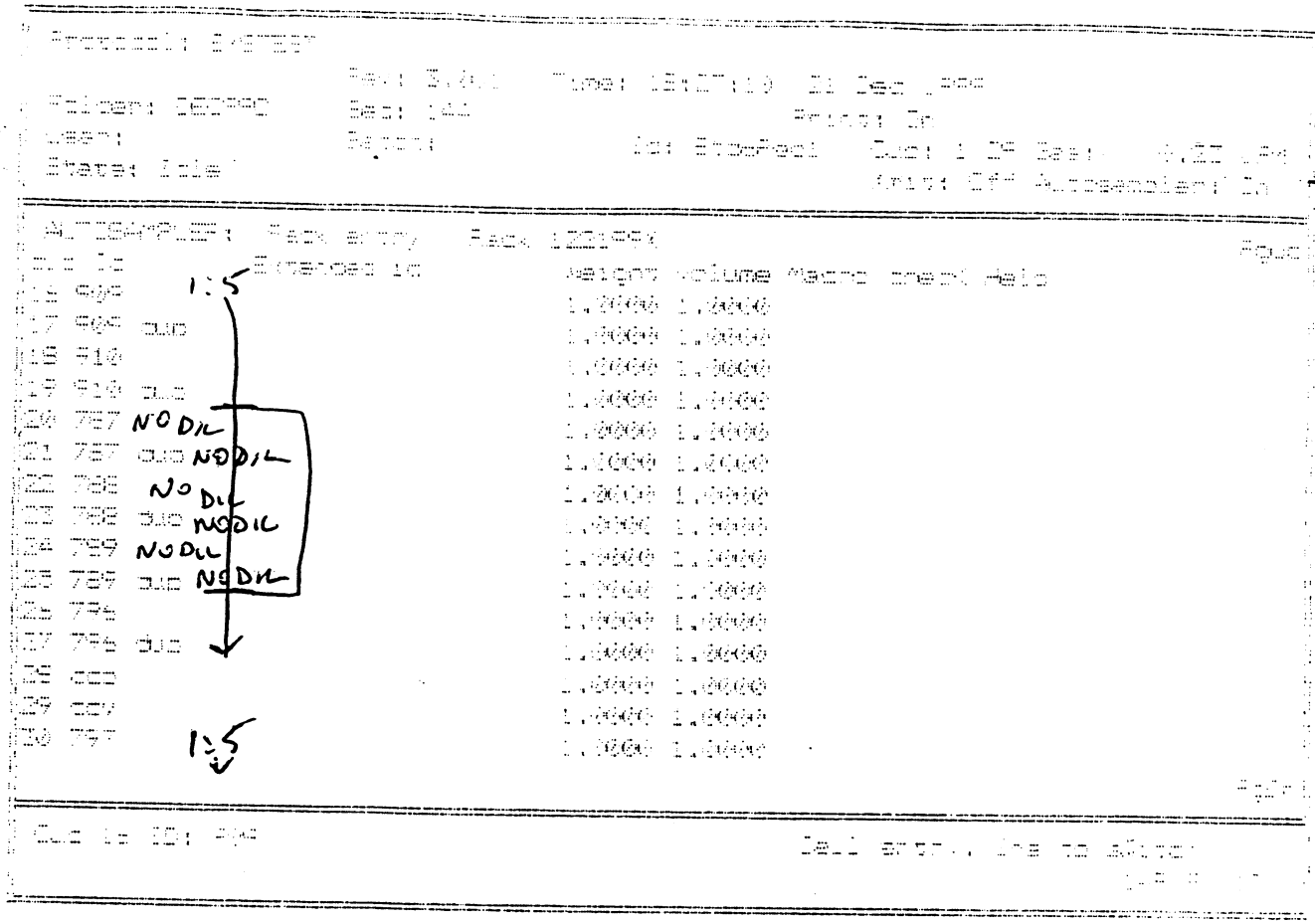
User: Batch: Id: Stc6Pac1 Cuc: 1 29 Bas: [illegible]

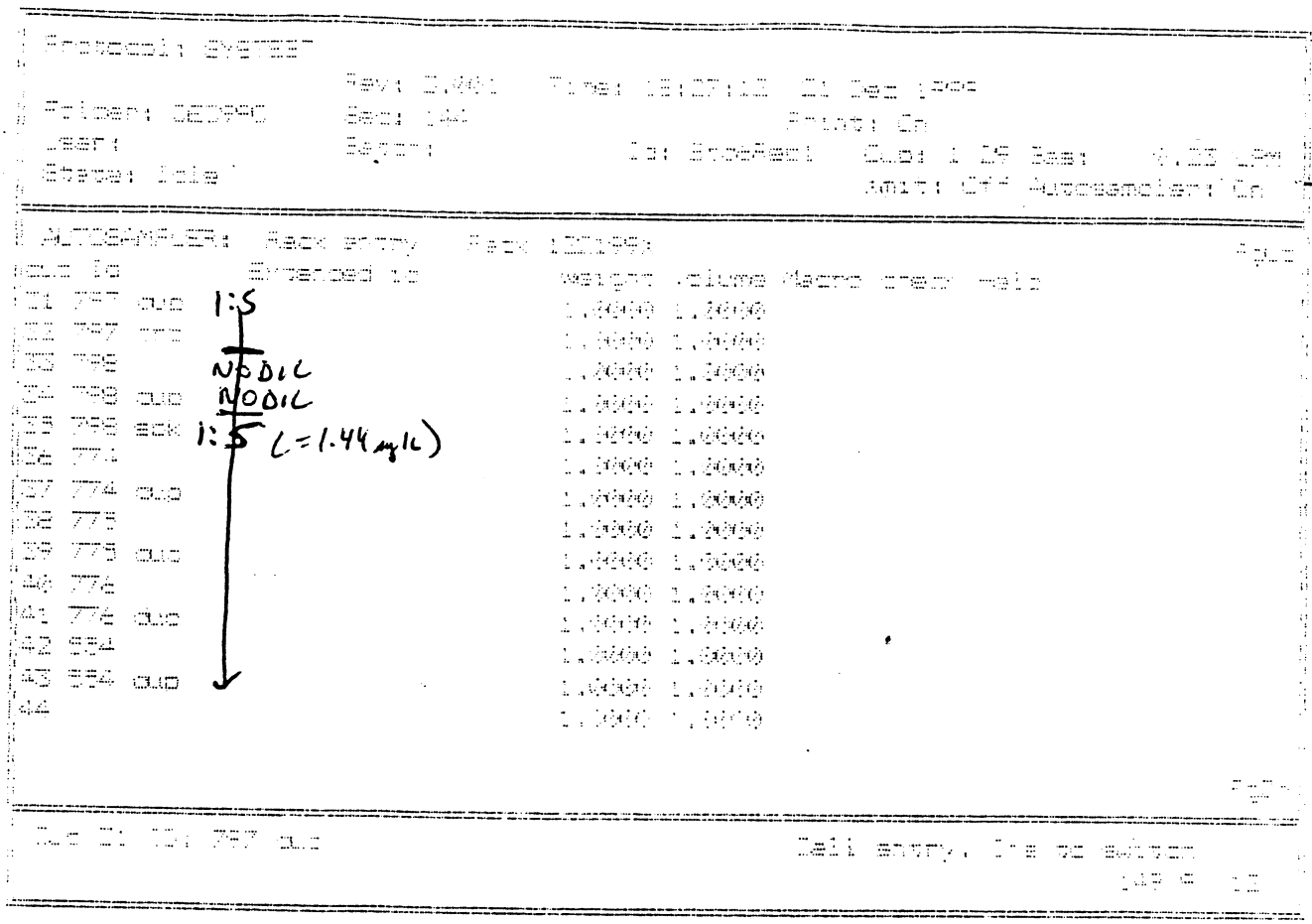
State: Idle Unit: [illegible] Automatic [illegible]

AUTOSAMPLER: Pack entry Rack 122199:

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 nist 1630a		1.0000	1.0000		
5 1630a cup		1.0000	1.0000		
6 801 1:5		1.0000	1.0000		
7 801 cup 1:5		1.0000	1.0000		
8 801 trp 1:5		1.0000	1.0000		
9 802		1.0000	1.0000		
10 802 cup		1.0000	1.0000		
11 802 spk		1.0000	1.0000		
12 803		1.0000	1.0000		
13 803 cup		1.0000	1.0000		
14 908		1.0000	1.0000		
15 908 cup		1.0000	1.0000		

Cup 1 ID: icb Cell entry, [illegible]


1:5
NO DIL
NO DIL
NO DIL
NO DIL
NO DIL
1:5



Protocol: SYSTEST

Rev: 3.001 Time: 15:27:12 21 Dec 1999

Folder: DED990 Sec: 144 Print: On

User: Batch: Id: Std6Rec1 Cup: 1 29 Bas: 0.23 LPM

State: Idle Amit: Off Autosampler: On

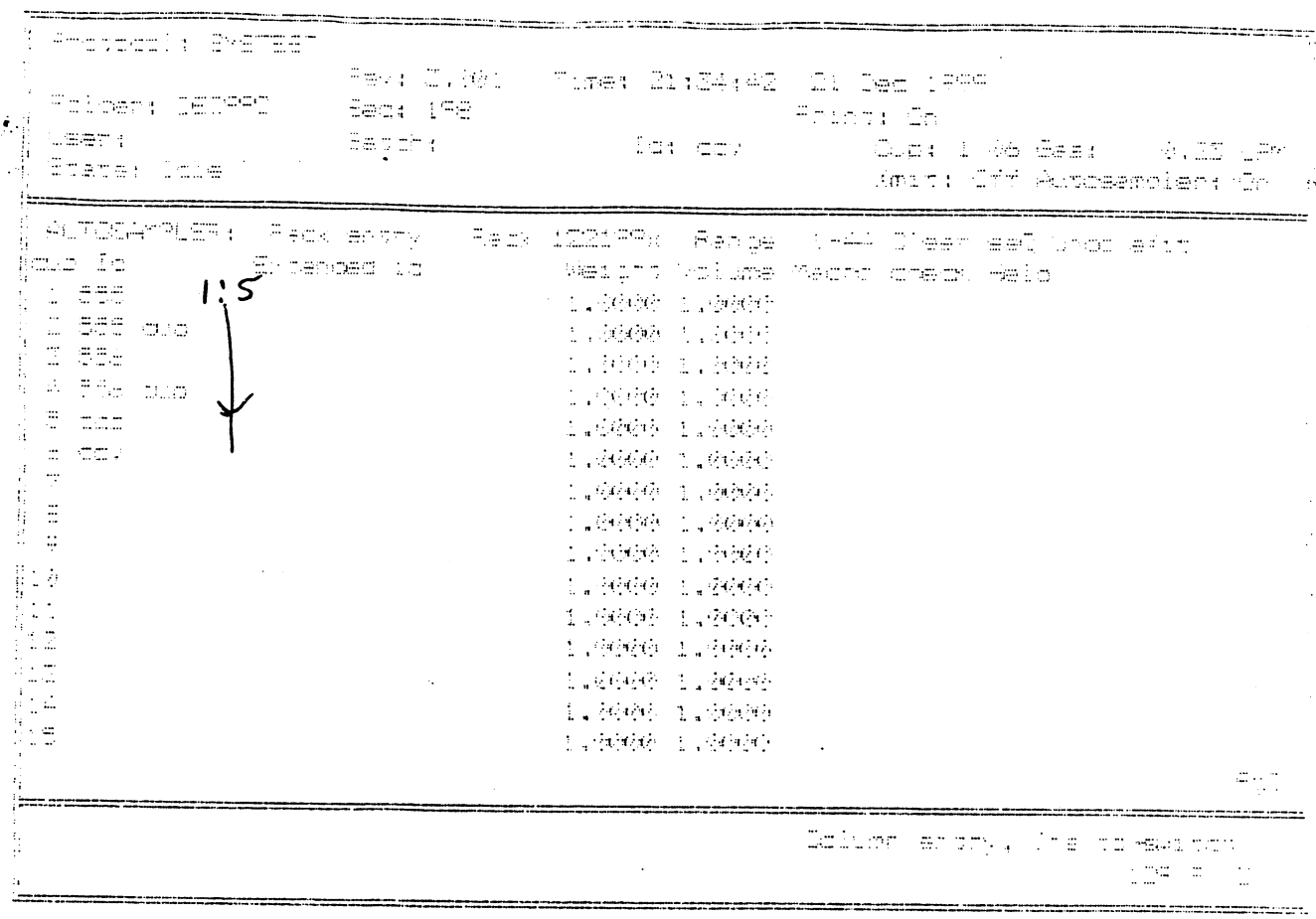
AUTOSAMPLER: Rack entry Rack 1ZZ199X Rpt

cup Id	Extended id	weight	volume	Macro check	Help
31 797 cup	1:5	1.0000	1.0000		
32 797 trt		1.0000	1.0000		
33 798	NODIL	1.0000	1.0000		
34 798 cup	NODIL	1.0000	1.0000		
35 798 sck	1:5 (=1.44 ug/L)	1.0000	1.0000		
36 774		1.0000	1.0000		
37 774 cup		1.0000	1.0000		
38 775		1.0000	1.0000		
39 775 cup		1.0000	1.0000		
40 776		1.0000	1.0000		
41 776 cup		1.0000	1.0000		
42 554		1.0000	1.0000		
43 554 cup		1.0000	1.0000		
44		1.0000	1.0000		

Rpt

Cup 31 ID: 797 cup Cell entry. Ins to switch

149 9 12


1:5

*** Standard: 1 Rep: 1 Seq: 138 18:03:55 21 Dec 1999 HG

Hg .000 ug/L 1096
Ave. Int. = 1096 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 139 18:06:17 21 Dec 1999 HG

Hg .200 ug/L 9335
Ave. Int. = 9335 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 140 18:08:40 21 Dec 1999 HG

Hg .500 ug/L 20394
Ave. Int. = 20394 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 141 18:11:02 21 Dec 1999 HG

Hg 1.00 ug/L 46366
Ave. Int. = 46366 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 142 18:13:26 21 Dec 1999 HG

Hg 2.00 ug/L 85029
Ave. Int. = 85029 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 143 18:15:55 21 Dec 1999 HG

Hg 3.00 ug/L 125926
Ave. Int. = 125926 S. D. = 0

Protocol: SYSTEST

Rev: 3.001 Time: 18:21:11 21 Dec 1999

Folder: DEC99C Seq: 144 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	-.005	-.005	Quadratic
S2	.200	.192	-.008	WtdLinear
S3	.500	.456	-.044	
S4	1.00	1.00	.077	Accept
S5	2.00	2.00	.001	
S6	3.00	2.98	-.021	StdAdd

A .0000000 r .999383

B 2.39012e-5 C -3.11681e-2

	Mean	%RSD	
S1	1096	0	1096
S2	9335	0	9335
S3	28394	0	28394
S4	46366	0	46366
S5	85028	0	85028
S6	125926	0	125926

Concentration

Relative Absorbance

337

New calibration coefficients stored 149 2 5

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Check Standard: 2 CVD				Sec: 144	18:29:37 21 Dec 1999 HG				
Line	Flag	%Rcvr.	Found	True	Units	SD/RSD			
Hg		104.	.626	.604	ug/L	.000			
*** Sample ID: icc				Sec: 145	18:32:36 21 Dec 1999 HG				
Hg	-.010	ug/L	.000	-.010					<0.0002 mg/L
*** Sample ID: blk				Sec: 146	18:34:52 21 Dec 1999 HG				
Hg	.087	ug/L	.000	.087					<0.0002 mg/L
*** Sample ID: blk dup				Sec: 147	18:37:11 21 Dec 1999 HG				
Hg	.090	ug/L	.000	.090					<0.0002 mg/L
*** Sample ID: nist 1630a				Sec: 148	18:45:49 21 Dec 1999 HG				
Hg	1.82	ug/L	.000	1.82					0.091 mg/kg
*** Sample ID: 1630a dup				Sec: 149	18:48:11 21 Dec 1999 HG				
Hg	1.80	ug/L	.000	1.80					0.090 µg/g
~~*** Sample ID: [illegible]~~			~~TX-Nm~~	~~Sec: 150~~	~~18:50:21 21 Dec 1999 HG~~				
Hg	4.64	ug/L	.000	4.64					NO DATA
*** Sample ID: 801			1:5	Sec: 151	19:38:47 21 Dec 1999 HG				
Hg	.908	ug/L	.000	.908					0.222 µg/g
*** Sample ID: 801 dup			1:5	Sec: 152	19:41:03 21 Dec 1999 HG				RPD = 3.3%
Hg	.938	ug/L	.000	.938					0.208 µg/g
*** Sample ID: 801 trp			1:5	Sec: 153	19:43:22 21 Dec 1999 HG				RPD = <1.0%
Hg	.917	ug/L	.000	.917					0.225 µg/g
*** Sample ID: 802			TX-Nm 1:5	Sec: 154	19:45:42 21 Dec 1999 HG				
Hg	.552	ug/L	.000	.552					0.180 ug/kg
*** Sample ID: 802 dup			1:5	Sec: 155	19:48:01 21 Dec 1999 HG				RPD = <1.0%
Hg	.555	[illegible]	[illegible]	[illegible]					~~0.180 ug/g~~

TV = 0.106 ± 0.032

TV=1.0 99.8%

1:5 0.362 mg/g

1:5 0.365 mg/g RPD = <1.0%

1:5 0.110 mg/g

1:5 0.113 mg/g RPD = 2.6%

1:5 0.102 mg/g

1:5 0.106 mg/g RPD = 3.8%

1:5 0.098 mg/g

1:5 0.099 mg/g RPD = 1.7%

1:5 NO DATA

0.022 mg/g

RPD = <1.0%

0.022 mg/g

20:19:14 21 Dec 1999 Folder: DEC99C Page 2
Protocol: SYSTEST

Line	Conc.	Units	SD/RSD	1	2	3	4	5
←→ Sample ID: [illegible]					Sec: [illegible]			
Hg	.122	ug/L	.000	.122				
←→ Sample ID: 786 [redacted]					Sec: 169	20:22:17 21 Dec 1999		
Hg	.759	ug/L	.000	.759				
←→ Sample ID: 786 duc					Sec: 170	20:24:43 21 Dec 1999	HG	
Hg	.759	ug/L	.000	.758				
←→ Sample ID: 789 [redacted]					Sec: 171	20:27:02 21 Dec 1999	HG	
Hg	.514	ug/L	.000	.514				
←→ Sample ID: 789 duc					Sec: 172	20:29:21 21 Dec 1999	HG	
Hg	.525	ug/L	.000	.525				
←→ Sample ID: 79[redacted]					Sec: 173	20:31:39 21 Dec 1999	HG	
Hg	.385	ug/L	.000	.385				
←→ Sample ID: 79[redacted] duc					Sec: 174	20:33:58 21 Dec 1999	HG	
Hg	.376	ug/L	.000	.376				
←→ Sample ID: [illegible]					Sec: 175	20:36:16 21 Dec 1999	HG	
Hg	-.027	ug/L	.000	-.027				
←→ Sample ID: 787					Sec: 176	20:38:37 21 Dec 1999	HG	
Hg	1.98	ug/L	.000	1.98				
←→ [illegible]					Sec: [illegible]			
Hg	.222	ug/L	.000	.222				
←→ Sample ID: 787 duc					Sec: 178	20:43:13 21 Dec 1999	HG	
Hg	.223	ug/L	.000	.223				
←→ Sample ID: 78[redacted]					Sec: 179	20:45:32 21 Dec 1999	HG	
Hg	.220	ug/L	.000	.220				

1:5

NO DATA

0.039 µg/g

RPD = <1.0%

0.039 µg/g

0.024 µg/g

RPD = 2.1%

0.025 µg/g

1:5

0.096 µg/g

1:5

RPD = <1.0%

0.087 µg/g

<0.2 µg/L

TV = 2.00

99%

1:5

0.077 µg/g

1:5

RPD = <1.0%

0.079 µg/g

1:5

RPD = 2.5%

0.082 µg/g

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
[redacted]			1:5	Sec: 180	20:4[illegible]	21 Dec 1999 HG			
Hg	-.032	ug/L	.000	-.032		NO DATA			
*** Sample ID: 798				Sec: 181	20:56:07	21 Dec 1999 HG			
Hg	2.20	ug/L	.000	2.20	0.103 µg/g	~~0.516 µg/g~~ gpo 1/6/00			
*** Sample ID: 798 dup				Sec: 182	20:58:33	21 Dec 1999 HG			RPD = <1.0%
Hg	2.22	ug/L	.000	2.22	0.104 µg/g	~~0.520 µg/g~~ gpo 1/6/00			
*** Sample ID: 798 spk			1:5	Sec: 183	21:00:57	21 Dec 1999 HG			
Hg	1.44	ug/L	.000	1.44		TV=1.0			
						100%			
*** Sample ID: 774[redacted]			1:5	Sec: 184	21:03:19	21 Dec 1999 HG			
Hg	.535	ug/L	.000	.53[illegible]		0.134 µg/g			
*** Sample ID: 774 dup			1:5	Sec: 185	21:05:39	21 Dec 1999 HG			RPD = <1.0%
Hg	.531	ug/L	.000	.531		0.133 µg/g			
*** Sample ID: 77[redacted]			1:5	Sec: 186	21:08:00	21 Dec 1999 HG			
Hg	.57[illegible]	ug/L	.000	.57[illegible]		0.142 µg/g			
*** Sample ID: 775 dup			1:5	Sec: 187	21:10:21	21 Dec 1999 HG			RPD = 1.0%
Hg	.57[illegible]	ug/L	.000	.57[illegible]		0.143 µg/g			
*** Sample ID: 776[redacted]N			1:5	Sec: 188	21:12:42	21 Dec 1999 HG			
Hg	.548	ug/L	.000	.548		0.141 µg/g			
[redacted]			1:5	Sec: [illegible]	[illegible]	[illegible]			RPD = <1.0%
Hg	.544	ug/L	.000	.544		0.139 µg/g			
*** Sample ID: 554 Big Brown			1:5	Sec: 190	21:17:24	21 Dec 1999 HG			
Hg	1.07	ug/L	.000	1.07		0.287 µg/g			
*** Sample ID: 554 dup			1:5	Sec: 191	21:19:45	21 Dec 1999 HG			RPD = <1.0%
Hg	1.07	ug/L	.000	1.07		0.287 µg/g			

Line	Conc.	Units	SD/REP	1	2	3	4	5
*** Sample ID: 555 BIGBROWN 1:5				Set: 152	21:22:11 21 Dec 1999 -8			
Hg	.995	ug/L	.000	.995				
*** Sample ID: 555 DUP				Set: 153	21:24:21 21 Dec 1999 -8			
Hg	1.00	ug/L	.000	1.00				
*** Sample ID: 556 BIG BROWN 1:5				Set: 154	21:27:09 21 Dec 1999 -8			
Hg	.962	ug/L	.000	.962				
*** Sample ID: 556 DUP				Set: 155	21:29:27 21 Dec 1999 -8			
Hg	.942	ug/L	.000	.942				
*** Sample ID: 111				Set: 156	21:31:49 21 Dec 1999 -8			
Hg	-.332	ug/L	.000	-.332				
*** Sample ID: 557				Set: 157	21:34:17 21 Dec 1999 -8			
Hg	1.99	ug/L	.000	1.99				

0.290 µg/g

RPD = <1.0%

0.291 µg/g

0.287 µg/g

RPD = 2.7%

0.280 µg/g

< 0.0002 mg/L

TV = 2.00 100%

Dry Weight(DW)/Total Volatile Solids (TVS) Notebook # 6

Sample Number/ Test (DW/TVS)	1386554	1386555	1386556	[illegible]	[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	9.8969	10.9647	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	0.9836	0.9849	.9842	0.9783
Difference	4.9231	6.0014	4.0233	8.2750	9.3601	10.1103
Sample amount g	5.6891	7.1840	4.8243	8.9220	9.9807	10.7310
Result	86.5%	83.5%	83.4%	[illegible] %	93.8%	[illegible] %

Sample Number/ Test (DW/TVS)	[illegible]	[illegible]	1384546	1384777	[illegible]	[illegible]
Client/Pan #	JAMMIS R1 7	—— R2 8	—— R3 9	WINDOWS CRK 10 R1	—— 11	12 R2
Wt of Pan + Sample	10.1893	8.7766	9.8541	7.65[illegible]4	6.6912	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	0.977[illegible]	0.9737	0.9801	0.9801	0.9784
Difference	9.0476	7.6741	8.7870	5.7861	5.4452	10.2357
Sample amount g	9.2[illegible]1	7.7571	8.8804	6.0703	5.7111	10.7305
Result	[illegible] %	98.9%	98.9%	95.3%	95.3%	[illegible] %

Sample Number/ Test (DW/TVS)	1384229	1384812	1384813	[illegible]
Client/Pan #	WINDOWS CRK 13 R3	MONTANA 14 R1	—— 15 R2	—— 16 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	0.9[illegible]04	0.9812	0.9779
Difference	5.9870	6.6507	6.3033	5.1197
Sample amount g	6.2[illegible]83	7.0941	6.7287	5.4201
Result	[illegible] %	[illegible] %	93.7%	[illegible] %

Batch Number ——
TVS -
DW - 3395

Note:
METCO COALS
CONTD -

Analyst: [illegible] Date: 10/21/94

TestAmerica INCORPORATED

APPENDIX E

Unit Operational Data

DATE	HOUR	MINUTE	M/W	STACK FLOW	MOISTURE	O_2	CO_2	NO_x	SO_2
BBSES UNIT 1 MERCURY TEST RUN 1									
11/9/99	10	30	575	99600000	13.5	5.9	13.4	243.3	1030.0
11/9/99	10	45	576	98600000	13.5	5.8	13.5	239.8	1039.0
11/9/99	11	0	576	97700000	12.9	5.8	13.4	245.1	1044.0
11/9/99	11	15	575	98300000	12.9	5.8	13.4	240.0	1046.0
11/9/99	11	30	576	97900000	11.5	5.7	13.4	242.7	1051.0
11/9/99	11	45	576	98300000	13.3	5.8	13.3	248.1	1049.0
11/9/99	12	0	576	97800000	12.5	5.7	13.3	239.3	1051.0
11/9/99	12	15	576	97800000	13.3	5.8	13.3	244.4	1058.0
11/9/99	12	30	576	97700000	12.3	5.7	13.3	242.6	1063.0
11/9/99	12	45	576	97900000	14.0	5.8	13.3	236.4	1063.0
11/9/99	13	0	576	97600000	14.3	5.8	13.2	250.2	1062.0
11/9/99	13	15	575	97600000	13.1	5.8	13.3	239.1	1070.0
11/9/99	13	30	576	97600000	11.7	5.7	13.3	240.6	1063.0
11/9/99	13	45	576	97400000	13.6	5.8	13.2	247.2	1061.0
		Average	576	98,500,000	13.55	5.85	13.3	245.25	1045.5
BBSES UNIT 1 MERCURY TEST RUN 2									
11/9/99	14	45	576	97200000	13.7	5.8	13.2	244.9	1094.0
11/9/99	15	0	576	97200000	12.9	5.8	13.2	250.6	1090.0
11/9/99	15	15	575	98000000	13.3	5.8	13.2	247.0	1080.0
11/9/99	15	30	576	97800000	14.3	5.9	13.1	248.2	1068.0
11/9/99	15	45	576	97600000	15.0	5.9	13.2	243.4	1070.0
11/9/99	16	0	575	97400000	12.5	5.8	13.1	246.9	1057.0
11/9/99	16	15	576	97900000	12.1	5.7	13.2	250.2	1062.0
11/9/99	16	30	575	97500000	13.4	5.8	13.2	247.9	1063.0
11/9/99	16	45	576	97900000	12.4	5.7	13.2	249.6	1059.0
11/9/99	17	0	575	98100000	13.1	5.8	13.2	247.7	1067.0
11/9/99	17	15	576	97900000	12.3	5.7	13.2	235.2	1064.0
11/9/99	17	30	576	98400000	13.5	5.8	13.1	243.7	1041.0
11/9/99	17	45	575	98200000	12.3	5.8	13.2	245.3	1034.0
11/9/99	18	0	577	98500000	13.6	5.8	13.2	242.2	1029.0
11/9/99	18	15	576	99000000	14.2	5.8	13.2	246.3	1017.0
		Average	576	98,100,000	13.95	5.8	13.2	245.6	1055.5
BBSES UNIT 1 MERCURY TEST RUN 3									
11/10/99	8	0	575	100100000	12.7	5.9	13.4	247.3	946.0
11/10/99	8	15	575	100400000	12.4	5.9	13.4	247.8	950.0
11/10/99	8	30	576	99600000	12.3	5.8	13.4	244.1	951.0
11/10/99	8	45	576	99800000	12.3	5.8	13.4	246.1	953.0
11/10/99	9	0	576	100000000	12.6	5.8	13.4	242.9	953.0
11/10/99	9	15	576	99600000	11.5	5.8	13.3	248.9	944.0
11/10/99	9	30	576	99700000	12.8	5.8	13.4	243.2	948.0
11/10/99	9	45	576	98800000	13.7	5.8	13.4	238.4	958.0
11/10/99	10	0	577	98900000	12.5	5.8	13.4	242.7	966.0
11/10/99	10	15	576	98500000	13.6	5.8	13.4	239.4	976.0
11/10/99	10	30	576	97400000	11.9	5.7	13.4	238.3	983.0
11/10/99	10	45	576	97300000	12.1	5.8	13.4	246.2	977.0
11/10/99	11	0	576	98000000	13.3	5.8	13.4	244.7	977.0
11/10/99	11	15	576	97600000	12.9	5.8	13.4	245.4	969.0
		Average	576	98,850,000	12.8	5.85	13.4	246.35	957.5

BBSES MERCURY TEST

RUN - 1		1-1 INLET EAST KVA	1-2 OUT EAST KVA	1-2 INLET EAST KVA	1-2 OUT EAST KVA	1-3 INLET EAST KVA	1-3 OUT EAST KVA	1-4 INLET EAST KVA	1-4 OUT EAST KVA	1-1 INLET WEST KVA	1-2 OUT WEST KVA	1-2 INLET WEST KVA	1-2 OUT WEST KVA	1-3 INLET WEST KVA	1-3 OUT WEST KVA	1-4 INLET WEST KVA	1-4 OUT WEST KVA
11/9/99	10:30:00																
11/9/99	10:45:00	61	44	40	56	63	48	66	57	54	69	65	54	55	45	68	51
11/9/99	11:00:00	50	42	55	58	67	48	70	57	54	69	64	54	58	45	68	51
11/9/99	11:15:00	60	44	56	58	62	48	69	57	60	69	63	54	53	45	68	51
11/9/99	11:30:00	47	42	56	58	59	48	64	57	55	69	68	54	57	45	67	51
11/9/99	11:45:00	60	44	60	58	66	48	70	57	55	69	66	54	55	45	70	51
11/9/99	12:00:00	48	43	56	59	69	48	70	57	55	70	66	54	58	45	69	51
11/9/99	12:15:00	62	43	49	58	55	48	65	57	55	70	59	54	53	45	72	51
11/9/99	12:30:00	60	43	56	58	64	48	64	57	53	70	65	54	55	45	72	51
11/9/99	12:45:00	61	43	44	58	63	48	68	57	55	70	65	54	58	45	63	51
11/9/99	13:00:00	62	42	56	57	66	48	70	57	55	69	66	54	53	45	71	51
11/9/99	13:15:00	61	42	53	57	63	48	66	57	55	69	56	54	54	45	66	51
11/9/99	13:30:00	61	42	57	57	58	48	64	57	55	69	69	54	58	45	68	51
11/9/99	13:45:00	50	42	55	58	65	48	65	57	55	69	61	54	54	45	65	51
	average	57	43	53	58	63	48	67	57	55	69	64	54	55	45	68	51

RUN - 1		STEAM FLOW KLB/HR	COAL FLOW TONS/HR	EXIT GAS A SIDE DEGF	EXIT GAS B SIDE DEGF	ESP A INLET GAS DEGF	ESP B INLET GAS DEGF	ESP 1-1 OUTLET GAS DEGF	ESP 1-2 OUTLET GAS DEGF	ESP 1-3 OUTLET GAS DEGF	ESP 1-4 OUTLET GAS DEGF	BH 1-1 OUTLET GAS DEGF	BH 1-2 OUTLET GAS DEGF	BH 1-3 OUTLET GAS DEGF	BH 1-4 OUTLET GAS DEGF	BH 1-1 PRESS. DIFF. INWC	BH 1-2 PRESS. DIFF. INWC	BH 1-3 PRESS. DIFF. INWC	BH 1-4 PRESS. DIFF. INWC
11/9/99	10:30:00			793.6	809	344.1	349.1	340	340	345	344	329	328	334	332	7.918	6.937	7.448	7.306
11/9/99	10:45:00	4062.6	465.4	791.8	806.1	343.9	348.6	340	342	345	343	329	330	333	332	8.068	6.957	7.457	7.508
11/9/99	11:00:00	4050.8	456.8	790.2	803.9	343.8	348.7	341	341	346	345	330	330	334	333	7.847	6.165	7.337	7.257
11/9/99	11:15:00	4054.5	463	793.1	805	342.5	346.1	341	341	345	344	329	329	333	333	6.997	7.057	6.727	7.156
11/9/99	11:30:00	4074	454.9	789.2	804.8	345.6	349.8	343	343	346	344	330	330	334	333	7.678	6.586	7.388	7.167
11/9/99	11:45:00	4039.2	463.7	790.3	807.4	345.1	350	342	343	346	345	331	331	335	333	7.478	6.826	7.178	6.968
11/9/99	12:00:00	4042.2	453.8	790.3	806.5	344.9	350.1	342	343	348	346	331	331	336	334	7.747	6.646	7.377	7.217
11/9/99	12:15:00	4016.6	455	793	807.8	345.6	349.6	343	344	348	346	331	331	336	335	7.687	6.105	7.257	7.167
11/9/99	12:30:00	4041.5	462	794.1	807.8	345.1	350.7	343	344	348	346	331	333	336	335	7.738	6.976	7.227	6.397
11/9/99	12:45:00	4074.5	456	788.4	805.8	343.7	351.3	342	342	348	347	331	331	337	335	7.637	6.706	7.347	7.217
11/9/99	13:00:00	4027.4	452.6	790.4	803.9	344.8	351.8	341	342	348	348	331	331	338	336	7.618	6.796	7.437	7.277
11/9/99	13:15:00	4016	443.1	792.1	807.1	344.2	350.5	342	343	348	347	331	331	338	336	7.837	6.847	7.277	7.478
11/9/99	13:30:00	4041.6	452.7	792	807.3	346.7	351.4	343	343	348	348	333	333	339	336	7.388	6.006	7.437	7.187
11/9/99	13:45:00	4050.8	457.4	795.3	807.9	346.7	353.2	344	344	350	348	333	333	338	336	7.358	6.566	7.127	7.167
	average	4045.5	456.6	791.7	806.5	344.8	350.1	342	343	347	346	331	331	336	334	7.643	6.655	7.287	7.176

BBSES MERCURY TEST

RUN - 2		1-1 INLET EAST KVA	1-2 OUT EAST KVA	1-2 INLET EAST KVA	1-2 OUT EAST KVA	1-3 INLET EAST KVA	1-3 OUT EAST KVA	1-4 INLET EAST KVA	1-4 OUT EAST KVA	1-1 INLET WEST KVA	1-2 OUT WEST KVA	1-2 INLET WEST KVA	1-2 OUT WEST KVA	1-3 INLET WEST KVA	1-3 OUT WEST KVA	1-4 INLET WEST KVA	1-4 OUT WEST KVA
11/9/99	14:50:00	61	42	56	58	63	48	64	57	55	69	66	54	56	45	72	52
11/9/99	15:05:00	49	43	56	58	63	52	70	57	60	69	66	53	58	44	65	51
11/9/99	15:20:00	61	43	56	58	65	48	64	57	54	69	65	53	56	44	65	51
11/9/99	15:35:00	61	43	41	58	66	48	70	57	55	69	62	53	58	44	72	51
11/9/99	15:50:00	62	43	58	58	61	48	65	57	58	69	64	53	58	44	71	51
11/9/99	16:05:00	60	43	53	56	67	48	71	57	56	70	65	53	51	45	68	51
11/9/99	16:20:00	61	43	56	58	62	48	64	57	54	70	63	53	53	45	71	51
11/9/99	16:35:00	60	43	57	58	61	48	65	57	51	70	65	53	58	45	71	51
11/9/99	16:50:00	61	43	56	58	66	48	66	57	54	70	56	53	57	45	72	51
11/9/99	17:05:00	60	43	57	58	67	48	65	57	59	69	64	54	53	44	72	51
11/9/99	17:20:00	48	43	54	58	69	50	66	57	56	69	63	54	53	44	68	51
11/9/99	17:35:00	52	43	54	56	63	48	67	57	58	69	65	54	56	44	68	51
11/9/99	17:50:00	59	43	58	58	67	48	70	57	55	69	68	54	58	44	68	51
11/9/99	18:05:00	59	42	37	56	64	54	66	57	53	69	61	53	58	44	64	51
	average	58	43	54	58	65	49	67	57	56	69	64	53	56	44	69	51

RUN - 2		STEAM FLOW KLB/HR	COAL FLOW TONS/HR	EXIT GAS A SIDE DEGF	EXIT GAS B SIDE DEGF	ESP A INLET GAS DEGF	ESP B INLET GAS DEGF	ESP 1-1 OUTLET GAS DEGF	ESP 1-2 OUTLET GAS DEGF	ESP 1-3 OUTLET GAS DEGF	ESP 1-4 OUTLET GAS DEGF	BH 1-1 OUTLET GAS DEGF	BH 1-2 OUTLET GAS DEGF	BH 1-3 OUTLET GAS DEGF	BH 1-4 OUTLET GAS DEGF	BH 1-1 PRESS. DIFF. INWC	BH 1-2 PRESS. DIFF. INWC	BH 1-3 PRESS. DIFF. INWC	BH 1-4 PRESS. DIFF. INWC
11/9/99	14:50:00	4037.9	448.8	789.9	810.6	346.4	354.5	345	344	352	351	334	333	342	339	7.798	6.616	7.306	7.418
11/9/99	15:05:00	4025.5	451.6	792.5	811.8	346	354.6	344	344	351	351	333	333	341	339	7.758	7.036	7.397	7.347
11/9/99	15:20:00	4051.7	454.8	792.6	809.2	346.2	354.1	344	344	352	351	333	333	341	339	7.306	6.627	7.036	6.446
11/9/99	15:35:00	4033.4	459.5	797.2	814.8	346.9	354.6	344	344	352	350	333	333	341	339	7.758	5.977	7.277	7.247
11/9/99	15:50:00	4009.8	456	794.8	811.8	346.8	355.1	345	344	352	351	334	333	341	339	7.828	6.796	7.367	7.367
11/9/99	16:05:00	4068.3	456.6	795	809.5	347	356.1	344	344	353	352	333	334	342	340	7.758	6.826	7.448	7.497
11/9/99	16:20:00	4005	456.5	794.8	812.7	346.4	354.8	344	344	352	351	333	333	342	340	7.487	6.997	7.437	7.287
11/9/99	16:35:00	4073.3	460.8	797.3	813.6	347.9	354.3	345	345	351	351	333	334	342	340	6.997	6.586	7.437	7.247
11/9/99	16:50:00	4037.2	476.8	796.8	813.8	347.3	354.9	345	345	352	351	333	334	342	340	7.627	5.955	7.397	7.328
11/9/99	17:05:00	4005.4	460.8	798.3	812.4	348.6	355.8	346	346	352	352	334	334	341	340	7.497	6.717	7.287	7.227
11/9/99	17:20:00	4010.1	461.7	798.2	813.8	349.3	356.5	346	347	353	352	335	335	342	340	8.017	6.867	7.508	7.787
11/9/99	17:35:00	4035.9	475.9	797.3	811.9	348	355.9	346	347	354	352	335	335	342	340	7.927	7.148	7.536	7.437
11/9/99	17:50:00	3999.6	473.8	800.2	814.8	347.4	355.4	345	344	354	351	334	334	342	340	8.098	7.077	7.437	7.397
11/9/99	18:05:00	4038.6	479.5	798.6	811.7	348	354.7	346	346	352	351	334	334	342	340	7.858	6.397	7.768	7.798
	average	4030.8	462.4	796.0	812.3	347.3	355.1	345	345	352	351	334	334	342	340	7.694	6.687	7.403	7.345

BBSES MERCURY TEST

RUN - 3		1-1 INLET EAST KVA	1-2 OUT EAST KVA	1-2 INLET EAST KVA	1-2 OUT EAST KVA	1-3 INLET EAST KVA	1-3 OUT EAST KVA	1-4 INLET EAST KVA	1-4 OUT EAST KVA	1-1 INLET WEST KVA	1-2 OUT WEST KVA	1-2 INLET WEST KVA	1-2 OUT WEST KVA	1-3 INLET WEST KVA	1-3 OUT WEST KVA	1-4 INLET WEST KVA	1-4 OUT WEST KVA
11/10/99	8:05:00	18	40	12	55	29	47	18	57	32	67	38	56	30	46	34	50
11/10/99	8:20:00	18	38	14	55	32	47	28	57	34	67	38	56	38	46	40	49
11/10/99	8:35:00	34	42	23	57	43	47	29	57	38	67	42	56	36	46	52	49
11/10/99	8:50:00	33	42	21	57	43	47	32	57	37	69	47	56	42	46	53	49
11/10/99	9:05:00	29	42	21	57	41	48	28	57	41	68	44	55	41	45	46	50
11/10/99	9:20:00	41	40	24	55	48	48	38	57	41	68	52	55	49	45	56	50
11/10/99	9:35:00	53	40	30	57	51	48	56	57	54	68	57	55	54	45	65	50
11/10/99	9:50:00	61	42	35	57	49	48	59	57	55	68	59	54	52	45	61	51
11/10/99	10:05:00	61	41	40	56	63	48	62	56	55	69	63	54	56	45	65	51
11/10/99	10:20:00	49	41	50	56	59	48	65	56	58	69	68	54	53	45	66	51
11/10/99	10:35:00	61	43	47	56	62	48	60	56	56	69	57	54	53	45	67	51
11/10/99	10:50:00	60	43	53	56	64	48	63	56	54	69	63	54	59	45	67	51
11/10/99	11:05:00	60	42	55	57	63	48	59	56	54	69	61	54	57	45	71	51
11/10/99	11:20:00	59	42	56	57	63	48	66	56	54	69	66	54	53	45	66	51
	average	46	41	34	56	51	48	47	57	47	68	54	55	48	45	58	50

RUN - 3		STEAM FLOW KLB/HR	COAL FLOW TONS/HR	EXIT GAS A SIDE DEGF	EXIT GAS B SIDE DEGF	ESP A INLET GAS DEGF	ESP B INLET GAS DEGF	ESP 1-1 OUTLET GAS DEGF	ESP 1-2 OUTLET GAS DEGF	ESP 1-3 OUTLET GAS DEGF	ESP 1-4 OUTLET GAS DEGF	BH 1-1 OUTLET GAS DEGF	BH 1-2 OUTLET GAS DEGF	BH 1-3 OUTLET GAS DEGF	BH 1-4 OUTLET GAS DEGF	BH 1-1 PRESS. DIFF. INWC	BH 1-2 PRESS. DIFF. INWC	BH 1-3 PRESS. DIFF. INWC	BH 1-4 PRESS. DIFF. INWC
11/10/99	8:05:00	4104.7	457.4	796.2	810.2	335.4	342.6	331	332	339	337	318	319	327	326	7.858	6.326	7.478	7.487
11/10/99	8:20:00	4087.3	447	799	810.8	336.9	343.2	333	332	339	338	320	320	327	326	7.708	7.187	7.358	7.596
11/10/99	8:35:00	4045.7	450.3	797.1	811.6	336.2	344.3	333	332	340	339	321	321	329	328	7.787	6.946	7.437	7.627
11/10/99	8:50:00	4030.9	446.7	797.9	811.3	338.2	344.3	334	335	340	340	321	322	329	328	8.047	6.867	7.367	7.667
11/10/99	9:05:00	4025.9	443.6	799.7	810.3	338.5	343.9	334	335	340	340	322	322	330	328	7.968	7.178	7.858	7.528
11/10/99	9:20:00	4043.5	442.4	801.2	812.9	339.8	346	335	335	342	341	323	323	330	328	8.248	6.526	7.768	7.648
11/10/99	9:35:00	4025.2	447.4	802.1	813.3	340.3	346.7	336	337	342	341	324	324	331	329	7.727	6.787	7.687	7.717
11/10/99	9:50:00	4069.1	445.8	799.2	812	342.3	349.4	338	339	344	344	326	326	333	331	7.987	6.867	7.358	7.367
11/10/99	10:05:00	4018.4	444.7	798.6	812.3	343.2	348.7	339	340	346	344	327	328	334	332	7.717	6.968	7.487	7.437
11/10/99	10:20:00	4047.1	448.6	794.8	810.8	342.6	349.4	340	339	346	345	327	328	335	333	6.987	6.757	7.448	7.418
11/10/99	10:35:00	4002.9	440.4	792.5	811.8	342.6	350	340	340	347	345	327	328	335	333	7.837	6.105	7.347	7.407
11/10/99	10:50:00	4008.1	438.3	798.1	808.6	342.2	347.2	339	340	345	345	329	328	335	334	7.588	6.687	6.637	7.107
11/10/99	11:05:00	3980.8	438.8	801.3	811.6	342.8	347.5	340	340	345	344	328	329	334	332	7.517	6.517	7.437	6.917
11/10/99	11:20:00	3962	443	803.6	814.2	343.3	349.7	340	340	346	344	328	329	335	332	7.708	6.937	7.328	7.358
	average	4032.3	445.3	798.7	811.6	340.3	346.6	337	337	343	342	324	325	332	330	7.763	6.761	7.428	7.449

DATE	HOUR	MINUTE	OPACITY

BBSES UNIT 1 MERCURY TEST RUN 1

11/9/99	10	30	6.8
11/9/99	10	36	6.5
11/9/99	10	42	6.7
11/9/99	10	48	6.9
11/9/99	10	54	6.4
11/9/99	11	0	6.6
11/9/99	11	6	6.8
11/9/99	11	12	6.5
11/9/99	11	18	6.5
11/9/99	11	24	6.9
11/9/99	11	30	6.5
11/9/99	11	36	6.7
11/9/99	11	42	6.8
11/9/99	11	48	6.5
11/9/99	11	54	6.7
11/9/99	12	0	7.0
11/9/99	12	6	6.6
11/9/99	12	12	6.9
11/9/99	12	18	7.1
11/9/99	12	24	6.7
11/9/99	12	30	6.5
11/9/99	12	36	6.6
11/9/99	12	42	6.5
11/9/99	12	48	6.6
11/9/99	12	54	6.8
11/9/99	13	0	6.6
11/9/99	13	6	6.6
11/9/99	13	12	6.6
11/9/99	13	18	6.4
11/9/99	13	24	6.6
11/9/99	13	30	6.9
11/9/99	13	36	6.4
11/9/99	13	42	6.2
11/9/99	13	48	6.5
11/9/99	13	54	6.2
		average	6.6

BBSES UNIT 1 MERCURY TEST RUN 2

11/9/99	14	48	6.0
11/9/99	14	54	6.0
11/9/99	15	0	6.2
11/9/99	15	6	6.0
11/9/99	15	12	6.0
11/9/99	15	18	6.3
11/9/99	15	24	5.9
11/9/99	15	30	6.3
11/9/99	15	36	6.2
11/9/99	15	42	6.2
11/9/99	15	48	6.2
11/9/99	15	54	6.3
11/9/99	16	0	6.6
11/9/99	16	6	6.2
11/9/99	16	12	6.1
11/9/99	16	18	6.5
11/9/99	16	24	6.1

11/9/99	16	30	5.9
11/9/99	16	36	6.1
11/9/99	16	42	6.2
11/9/99	16	48	6.0
11/9/99	16	54	6.3
11/9/99	17	0	6.0
11/9/99	17	6	6.0
11/9/99	17	12	6.3
11/9/99	17	18	5.9
11/9/99	17	24	5.9
11/9/99	17	30	6.3
11/9/99	17	36	6.0
11/9/99	17	42	5.9
11/9/99	17	48	6.3
11/9/99	17	54	6.0
11/9/99	18	0	5.9
11/9/99	18	6	6.2
		average	6.1

BBSES UNIT 1 MERCURY TEST RUN 3

11/10/99	8	0	6.8
11/10/99	8	6	6.8
11/10/99	8	12	6.6
11/10/99	8	18	6.9
11/10/99	8	24	7.0
11/10/99	8	30	6.5
11/10/99	8	36	6.9
11/10/99	8	42	6.8
11/10/99	8	48	6.4
11/10/99	8	54	6.8
11/10/99	9	0	6.9
11/10/99	9	6	6.4
11/10/99	9	12	7.1
11/10/99	9	18	6.7
11/10/99	9	24	6.1
11/10/99	9	30	6.8
11/10/99	9	36	6.7
11/10/99	9	42	6.4
11/10/99	9	48	6.6
11/10/99	9	54	6.7
11/10/99	10	0	6.3
11/10/99	10	6	6.5
11/10/99	10	12	6.6
11/10/99	10	18	6.3
11/10/99	10	24	6.6
11/10/99	10	30	6.7
11/10/99	10	36	6.3
11/10/99	10	42	6.5
11/10/99	10	48	6.4
11/10/99	10	54	6.1
11/10/99	11	0	6.4
11/10/99	11	6	6.4
11/10/99	11	12	6.2
11/10/99	11	18	6.3
		average	6.6

APPENDIX F

Chain of Custody Records

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TX4
Location: Fairfield, TX
Unit: BBR Unit 1 Baghouse Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

REMARKS (Specific Compounds/Methods): Analyze according to the Ontario Hydro method. weigh filter & thimble until "check" DPS

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS
Container 1 - Run 1 Filter	11-9-99	1408	X				II	BH	✓								X			Ship to METCO for weight. Thimble QS8 Filter 47Q106
Container 2 - Run 1 0.1 N HNO_3 F.W.	11-9-99	1410	X				I	BH									X			Container 2A not recovered.
Container 3 - Run 1 10% HNO_3 Rinse Imp 1,2,3	11-9-99	1424	X				II	BH									X			
Container 4 - Run 1 0.1 N HNO_3 Rinse Imp 4	11-9-99	1427	X				I	BH									X			
Container 5 - Run 1 0.1 N HNO_3 Rinse Imp 5,6,7	11-9-99	1441	X				I	BH									X			Used NH_2OH-H_2SO_4
																				thimble/filter part. by Metco M. Ganter 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Duffy	11-12-99 1000	Jason Brown
Jason Brown	11-12-99 1530	[signature]
Received for Laboratory By/Signature: [signature]	11-22-99	Date/Time 11/15/99 1050

Relinquished By/Sign:	Date/Time	Received By/Sign:

Send Samples to: TestAmerica
Phone: Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TX4
Location: Fairfield, TX
Unit: BBR Unit 1 Baghouse Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 1 - Run 2 Filter	11-9-99	1800	X				II	BH	✓								X			Ship to METCO for weight. Thimble Q59 Filter
Container 2 - Run 2 0.1 N HNO_3 F.W.	11-9-99	1809	X				I	BH									X			Container 2A not recovered.
Container 3 - Run 2 10% HNO_3 Rinse Imp 1, 2, 3	11-9-99	1822	X				II	BH									X			
Container 4 - Run 2 0.1 N HNO_3 Rinse Imp 4	11-9-99	1825	X				I	BH									X			
Container 5 - Run 2 0.1 N HNO_3 Rinse Imp 5, 6, 7	11-9-99	1842	X				II	BH									X			Used $NH_2OH - H_2SO_4$
																				filter/thimble part. by Metco M. Baxter 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Wyly	11-12-99 1000	Jann Brown			
Jann Brown	11-12-99 1530	[illegible]	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature: Steve Schleff	11-22-99	Date/Time 11/15/99 1045	Send Samples to: TestAmerica Phone:		Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TX4
Location: Fairfield, TX
Unit: BBR Unit 1 Baghouse Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	SAMPLE ANALYSIS REQUIRED: RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI--VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 1 - Run 3 Filter	11-10-99	1201	X				II	MB	✓								X			Ship to METCO for weight Thimble Q77 Filter 47Q114
Container 2 - Run 3 0.1 N HNO_3 F.W.	11-10-99	1203	X				I	MB									X			Container 2A not received
Container 3 - Run 3 10% HNO_3 Rinse Imp 1,2,3	11-10-99	1213	X				II	MB									X			
Container 4 - Run 3 0.1N HNO_3 Rinse Imp 4	11-10-99	1217	X				I	MB									X			
Container 5 - Run 3 0.1 N HNO_3 Rinse Imp 1,2,3	11-10-99	1227	X				I	MB									X			Used $NH_2OH \cdot H_2SO_4$
																				thimble/filter partic. by Metco M. Gantt 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Copley	11-12-99 1000	Jason Brown			
Jason Brown	11-12-99 1530	[signature]			
Received for Laboratory By/Signature: [signature]	11-22-99	Date/Time 11/15/99 1045	Send Samples to: TestAmerica Phone:		Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TXU Electric
Location: Fairfield, TX (BBSES)
Unit: BBR Unit 1 Baghouse Inlet Duct

Collected By/Company: METCO

BBR Unit 1 Baghouse Inlet Duct - Blank Train SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 3 - Blank Train 10% HNO_3 rinse Imp. 1,2,3	11/10/99	1023	X				1	BH									X			Containers 1,2,2A not recovered
Container 4 - Blank Train 0.1N HNO_3 rinse Imp. 4	11/10/99	1025	X				1	BH									X			
Container 5 - Blank Train 0.1N HNO_3 rinse Imp. 5,6,7	11/10/99	1041	X				1	BH									X			$NH_2OH \cdot H_2SO_4$ used.

Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill [illegible]	11-12-99 1000	Jam Brom
Jam Brom	11-12-99 1530	[illegible]
Received for Laboratory By/Signature: [illegible]	11-22-99	Date/Time 11/15/99 1045

Relinquished By/Sign:	Date/Time	Received By/Sign:

Send Samples to: Test America
Phone: Fax:

METRO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TXU
Location: Fairfield, TX
Unit: BBR Unit 1 Stack

Collected By/Company: METRO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	SAMPLE ANALYSIS REQUIRED: RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI--VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 1 - Run 1 Filter ~~of~~	11-9-99	1459	X				I	BH	✓								X			Ship to METRO for weight. Filter 479105
Container 2 - Run 1 0.1 N HNO_3 ~~F.W.~~	11-9-99	1505	X				I	BH									X			Container 2A not recovered.
Container 3 - Run 1 10% HNO_3 Rinse Imp 1,2,3	11-9-99	1518	X				II	BH									X			
Container 4 - Run 1 0.1 N HNO_3 Rinse Imp 4	11-9-99	1521	X				I	BH									X			
Container 5 - Run 1 0.1 N HNO_3 Rinse Imp 5,6,7	11-9-99	1530	X				I	BH									X			Used $NH_2OH \cdot H_2SO_4$
																				filter pract. by metco M. Gantt 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Thuffy	11-12-99 1000	Jam Brown			
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Jam Brown	11-12-99 1530				
Received for Laboratory By/Signature:		Date/Time	Send Samples to: Test America		
	11-22-99	11/15/99 1115	Phone:	Fax:	

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TXU
Location: Fairfield, TX
Unit: BBR Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 1 - Run 2 Filter	11-9-99	1900	X				I	BH	✓								X			Analyze according to the Ontario Hydro Method. Ship to METCO for weight Filter 47Q110
Container 2 - Run 2 0.1 N HNO_3 F.W.	11-9-99	1902	X				I	BH									X			Container 2A not recovered.
Container 3 - Run 2 10% HNO_3 Rinse Imp 1,2,3	11-9-99	1914	X				II	BH									X			
Container 4 - Run 2 0.1 N HNO_3 Rinse Imp 4	11-9-99	1916	X				I	BH									X			
Container 5 - Run 2 0.1 N HNO_3 Rinse Imp 5,6,7	11-9-99	1930	X				I	BH									X			Used $NH_2OH \cdot H_2SO_4$
																				filter part. by Metco M. Gunter 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hyley	11-12-99 1000	Jam Brom			
Relinquished By/Sign: Jam Brom	Date/Time 11-12-99 1530	Received By/Sign: [signature]	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature: [signature] 11-22-99		Date/Time 11/15/99 1115	Send Samples to: Test America Phone:	Fax:	

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: ~~TXH~~ 99-182
Job Name: TXU
Location: Fairfield, TX
Unit: BBR Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI--VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
																				Analyze according to the Ontario Hydro Method
Container 1 -Run 3 Filter	11-10-99	1233	X				I	MB	✓								X			Ship to METCO for weight. Filter 47Q 112
Container 2-Run 3 0.1 N HNO_3 F.W.	11-10-99	1235	X				I	MB									X			Container 2A not recovered.
Container 3-Run 3 10% HNO_3 Rinse Imp 1,2,3	11-10-99	1242	X				II	MB									X			
Container 4-Run 3 0.1 N HNO_3 Rinse Imp 4	11-10-99	1244	X				I	MB									X			
Container 5-Run 3 0.1 N HNO_3 Rinse Imp 5,6,7	11-10-99	1253	X				I	MB									X			Used $NH_2OH-H_2SO_4$
																				filter particles by Metco W. Gentry 11/17/99

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Ugly	11-12-99 1000	Jason Brom			
Jason Brom	11-12-99 1530				

Received for Laboratory By/Signature: 11-22-99 Date/Time 11/15/99

Send Samples to: TestAmerica
Phone: Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TXU Electric
Location: Fairfield, TX
Unit: BBR Unit 1 Stack

Collected By/Company: METCO

SAMPLE ANALYSIS REQUIRED

REMARKS (Specific Compounds/Methods): Analyze according to Ontario-Hydro method.

BBR Unit 1 Stack Blank Train SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS
Container 3-Blank Train 10% HNO_3 rinse	11/10/99	0927	X				1	BH									X			Containers 1,2,2A not recovered.
Container 4-Blank Train 0.1N HNO_3	11/10/99	0929	X				1	BH									X			
Container 5-Blank Train 0.1N HNO_3	11/10/99	0939	X				1	BH									X			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hefley	11-12-99 1000	Jason Brown
Jason Brown	11-12-99 1530	[signature]
Received for Laboratory By/Signature: [signature]	11-22-99	Date/Time 11/15/99 1115

Relinquished By/Sign:	Date/Time	Received By/Sign:

Send Samples to: Test America
Phone: Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-182
Job Name: TX4
Location: Fairfield, TX
Unit: BBR Unit 1

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 7 0.1N HNO_3 Reagent Blank	11-9-99	0909	X				I										X			Vol. = 50 ml
Container 8 1 M KCl Reagent Blank	11-9-99	0910	X				I										X			Vol. = 50 ml
Container 9 5% HNO_3 - 10% H_2O_2 Reagent Blank	11-9-99	0911	X				I										X			Vol. = 50 ml
Container 10 $KMnO_4$ - H_2SO_4 Reagent Blank	11-9-99	0913	X				I										X			Vol. = 50 ml
Container 11 ~~NH_2H_2~~ $NH_2OH \cdot H_2SO_4$ Reagent Blank	11-9-99	0916	X				I										X			Vol. = 100 ml
Container 12 Filter Reagent Blank	11-9-99	0844	X				IV										X			Filter #: 47Q107, 47Q108, 47Q109 Thimble #: Q61, Q62, Q76

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hyley	11-12-99 1000	Jam Brown			
Jam Brown	11-12-99 1530	[signature]			

Received for Laboratory By/Signature: [signature] 11-22-99 Date/Time: 11/15/99 1115

Send Samples to: TestAmerica
Phone: Fax:

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.

METCO ENVIRONMENTAL

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.

METCO ENVIRONMENTAL

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.

JASON CONWAY; Environmental Technician I

Education	B.S. Biology, July 1999; Southeastern Oklahoma State University; Durant, Oklahoma.
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 testing procedures, 1999-Present.

METCO ENVIRONMENTAL

JASON BROWN; Environmental Technician I

Education	B. S. in Zoology, 1995; University of Oklahoma, Norman, Oklahoma.
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 testing procedures, 1999-Present.