7 APPENDICES

A. Source Emissions Calculations
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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)

EXAMPLE CALCULATIONS

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

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

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

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

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

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

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

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

3. Percent moisture in stack gas.

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

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

4. Mole fraction of dry gas.

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

5. Average molecular weight of dry stack gas.

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

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

6. Molecular weight of stack gas.

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

7. Percent excess air at sampling point.

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

8. Stack Pressure.

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

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

9. Stack velocity at stack conditions.

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

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

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

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 – ug/dscm

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

20. Mercury – lbs/10^{12} Btu

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

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

* 29.92 "Hg, 68 °F (760 mm Hg, 20 °C)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER: 99-95GIB3A
JOB NAME: EPRI
LOCATION: OWENSVILLE, IN.
UNIT TESTED: UNIT NUMBER 3 PRECIPITATOR INLET DUCT - HG

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			2	3	4
DATE			03/29/00	03/29/00	03/29/00
BEGIN TIME			1015	1345	1710
END TIME			1307	1636	2046
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.54 (750)	29.48 (749)	29.42 (747)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.494 (12.5)	0.492 (12.5)	0.497 (12.6)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	64.151 (1.817)	67.202 (1.903)	67.595 (1.914)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	76 (24.00)	64 (18.00)	61 (16.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	62.478 (1.769)	66.812 (1.892)	67.453 (1.910)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	102.8	121.7	115.5
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	4.852 (0.137)	5.744 (0.163)	5.452 (0.154)
%M	MOISTURE IN STACK GAS BY VOLUME	%	7.21	7.92	7.48
Tt	NET TIME OF TEST	MINUTES	160	160	160

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

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

EPRI
OWENSVILLE, IN.
UNIT NUMBER 3 PRECIPITATOR INLET DUCT - HG

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.9279	0.9208	0.9252
CO2		%	13.4	13.4	13.4
O2		%	6.0	6.2	6.2
CO		%	0.0	0.0	0.0
N2		%	80.6	80.4	80.4
%EA	EXCESS AIR @ SAMPLING POINT	%	39.1	41.0	41.0
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.38 (30.38)	30.39 (30.39)	30.39 (30.39)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.49 (29.49)	29.41 (29.41)	29.47 (29.47)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	1.063 (27.0)	1.062 (27.0)	1.071 (27.2)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	313 (156)	314 (157)	311 (155)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	28.32 (719)	28.29 (719)	28.21 (717)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	4,091 (20.78)	4,101 (20.83)	4,119 (20.92)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	87,552 (56.49)	87,552 (56.49)	87,552 (56.49)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	1,497,668 (2,544,538)	1,486,340 (2,525,292)	1,501,576 (2,551,178)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	2,487,043 (4,225,486)	2,493,355 (4,236,210)	2,504,050 (4,254,381)

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

SOURCE EMISSION CALCULATIONS

EPRI
OWENSVILLE, IN.
UNIT NUMBER 3 PRECIPITATOR INLET DUCT - HG

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	160	160	160
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.177 (0.004)	0.177 (0.004)	0.177 (0.004)
%I	PERCENT ISOKINETIC	%	93.1	100.3	100.3
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

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

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER: 99-95GIB3A
JOB NAME: EPRI
LOCATION: OWENSVILLE, IN.
UNIT TESTED: UNIT NUMBER 3 STACK - HG

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			2	3	4
DATE			03/29/00	03/29/00	03/29/00
BEGIN TIME			1015	1345	1710
END TIME			1312	1642	2052
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.34 (745)	29.28 (744)	29.22 (742)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.462 (11.7)	0.455 (11.6)	0.458 (11.6)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	65.840 (1.864)	64.333 (1.822)	62.859 (1.780)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	70 (21.00)	69 (21.00)	62 (17.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	64.405 (1.824)	62.920 (1.782)	62.176 (1.761)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	91.7	102.0	82.6
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	4.328 (0.123)	4.814 (0.136)	3.899 (0.110)
%M	MOISTURE IN STACK GAS BY VOLUME	%	6.30	7.11	5.90
Tt	NET TIME OF TEST	MINUTES	160	160	160

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

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

EPRI
OWENSVILLE, IN.
UNIT NUMBER 3 STACK - HG

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.9370	0.9289	0.9410
CO2		%	10.6	10.8	10.5
O2		%	9.2	8.8	9.1
CO		%	0.0	0.0	0.0
N2		%	80.2	80.4	80.4
%EA	EXCESS AIR @ SAMPLING POINT	%	76.3	70.4	74.6
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.06 (30.06)	30.08 (30.08)	30.04 (30.04)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.30 (29.30)	29.22 (29.22)	29.33 (29.33)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	0.904 (23.0)	0.896 (22.8)	0.904 (23.0)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	309 (154)	310 (154)	314 (157)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	29.24 (743)	29.17 (741)	29.11 (739)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	3,726 (18.93)	3,722 (18.91)	3,745 (19.02)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	115,172 (74.30)	115,172 (74.30)	115,172 (74.30)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	1,880,553 (3,195,060)	1,855,424 (3,152,365)	1,877,564 (3,189,981)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	2,980,247 (5,063,440)	2,977,256 (5,058,358)	2,995,056 (5,088,600)

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

SOURCE EMISSION CALCULATIONS

EPRI
OWENSVILLE, IN.
UNIT NUMBER 3 STACK - HG

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	160	160	160
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.174 (0.004)	0.174 (0.004)	0.174 (0.004)
%I	PERCENT ISOKINETIC	%	104.1	103.0	100.6
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

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

APPENDIX B

Field Data

METCO ENVIRONMENTAL

Job Number 99-95 GIB 3A
Job Name Epri
Run Number 1
Unit Unit 3 Inlet Duct
Date 3-29-00
Operator BROWN / BASS / Hefley
Sample Box No. Hg 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 42
Assumed Moisture % 6.99
Probe Length 10'
C Factor 10 → 24.5 to reference
Initial Leak @ 15.00 "Hg = 0.000 cfm
Final Leak @ - "Hg = - cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
AB4	0738	119.530	0.95	2.30	2.30	15.00	327	256	250	47	51	57	248	Duct A CST
3	0743	123.98	1.10	2.70	2.70	18.00	331	260	254	47	51	57	248	Int. Orsat
2	0748	128.37	1.00	2.50	2.50	18.00	323	262	253	48	51	58	249	
1	0753	132.55	1.10	2.70	2.70	18.00	314	260	253	50	51	58	250	
AE4	0758	135.88	0.55	1.35	1.35	11.00	311	264	253	53	52	59	255	
3	0803	138.85	0.55	1.35	1.35	11.00	317	262	252	53	52	58	256	
2	0808	142.05	0.91	2.25	2.25	18.00	316	260	254	55	51	57	258	
1	0813	146.00	1.00	2.50	2.50	18.00	303	259	251	55	51	59	259	
AH4	0818	148.84	0.65	1.60	1.60	14.00	287	255	250	55	54	61	257	
3	0823	151.70	0.65	1.60	1.60	14.00	290	256	252	56	54	61	257	
2	0828	154.24	0.40	1.00	1.00	12.00	304	257	253	56	54	62	257	Duct A P_s -14.8
1	0833	156.44	0.56	1.40	1.40	14.00	292	257	250	56	55	63	255	
AK4	0838	158.20	0.65	1.60	1.60	14.00	282	256	252	56	57	65	254	
3	0843	159.58	0.91	2.25	2.25	18.00	304	256	252	56	57	65	254	
2	0848	161.72	0.91	2.25	2.25	18.00	308	257	252	57	58	65	254	
1	0853	163.60	0.81	2.00	2.00	18.00	310	258	254	57	59	66	254	
END	0858	164.372	—	—	—	—	—	—	—	—	—	—	—	

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m - ft^3
Water Collected V_w - ml
Time of Test T_t 160 min.
Stack Pressure P_s - "H_2O

Pitot Tube No. 113
Baro. Press. P_b 29.50 "Hg
Probe Tip Dia. D_n 0.177 in.
% CO_2 - % CO 0.0
% O_2 - % N_2 -
Area Stack A_s 43776 in^2
87,552

Barometer No. 19-1 Probe Tip No. TFE1-6a
Total Volume of Leak Checks After Start: - ft^3
V_m = Dry Gas Meter Calibration Factor 0.998 X -

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

Run Number 1

Unit Unit #3 Inlet Duct

Date 3-29-00

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	Remarks

ABORTED!!

METCO ENVIRONMENTAL

Job Number 99-95 GIB3A
Job Name Epri
Run Number 2
Unit Unit 3 Inlet Duct
Date 3-29-00
Operator BROWN/BASS/Hefley
Sample Box No. Hg3 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 60
Assumed Moisture % 6.99
Probe Length 10'
C Factor 10 → 4.6 to reference
Initial Leak @ 15.00 "Hg = 0.000 cfm
Final Leak @ 12.00 "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	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
BB4	1015	165.121	1.00	0.46	0.46	6.00	338	252	256	59	75	74	262	Duct B
3	1020	167.03	1.20	0.56	0.56	6.50	341	253	256	59	75	74	260	CST
2	1025	169.25	1.10	0.51	0.51	6.50	349	255	255	57	73	77	257	Int. Orsat
1	1030	171.40	1.40	0.66	0.66	7.50	332	257	254	55	78	77	254	
BE4	1035	173.59	0.75	0.35	0.35	6.00	333	257	255	55	78	77	254	
3	1040	175.37	0.94	0.44	0.44	6.50	335	258	253	54	69	66	254	
2	1045	177.35	1.10	0.51	0.51	7.00	337	259	255	54	69	66	257	
1	1050	179.48	1.30	0.60	0.60	7.50	331	260	257	52	71	70	256	
BH4	1055	181.56	0.85	0.40	0.40	6.50	313	259	256	52	77	78	255	Gibson plant
3	1100	183.32	1.20	0.56	0.56	7.00	309	256	256	53	76	77	254	1050 soot blowing
2	1105	185.53	1.20	0.56	0.56	7.00	318	256	254	52	75	76	254	
1	1110	187.70	1.20	0.56	0.56	7.00	313	257	255	51	73	74	254	Duct B-16.5 Pa
BK4	1115	189.65	1.20	0.56	0.56	7.00	276	258	255	51	71	74	255	
3	1120	191.54	1.00	0.46	0.46	6.50	281	257	255	51	80	81	254	
2	1125	193.57	1.00	0.46	0.46	6.50	291	255	255	51	80	80	253	
1	1130	195.61	1.00	0.46	0.46	6.50	287	258	257	52	81	83	254	
END	1135	197.368	—	—	—	—	—	—	—	—	—	—	—	
AK4	1147	197.368	1.20	0.56	0.56	9.00	266	261	263	59	84	85	256	Duct A

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 64.151 ✓ ft^3
Water Collected V_w 102.8 ml
Time of Test T_t 160 min.
Stack Pressure P_s -16.6 "H_2O

Pitot Tube No. M3
Baro. Press. P_b 29.54 "Hg
Probe Tip Dia. D_n 0.177 in.
% CO_2 13.4 % CO 0.0
% O_2 4.0 % N_2 80.6
Area Stack A_s ~~43776~~ 87,552 in^2

Barometer No. 19-1
Probe Tip No. TFE1-6a
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 0.998 X 64.280

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

Impinger Box No. _____

Impinger 1	Final Weight	803.9
	Initial Weight	743.6
	Increase	60.3
Impinger 2	Final Weight	763.7
	Initial Weight	745.6
	Increase	
Impinger 3	Final Weight	680.0
	Initial Weight	675.1
	Increase	4.9
Impinger 4	Final Weight	667.7
	Initial Weight	660.5
	Increase	7.2
Impinger 5	Final Weight	761.7
	Initial Weight	761.4
	Increase	0.3
Impinger 6	Final Weight	761.5
	Initial Weight	761.1
	Increase	0.4
Impinger 7	Final Weight	661.9
	Initial Weight	662.5
	Increase	-0.6

Water Weight Gain

Imp 8 987.5
Final 975.3
Int. 12.2

V_w =
g SO_2 = _____
V_w =

Impinger 1	60.3
Impinger 2	18.1
Impinger 3	4.9
Impinger 4	7.2
Impinger 5	0.3
Impinger 6	0.4
Impinger 7	-0.6
Imp 8	12.2
Total	102.8 = V_w

P_b =	29.54	%CO_2 =	13.4
V_m =	64.151	%O_2 =	6.0
V_w =	102.8	%CO =	0.0
P_m =	0.494	%N_2 =	80.6
Avg ΔP =	1.063	A_s =	43776 (87,552)
		D_n =	0.177
Avg$\sqrt{\Delta P}$ =	1.027	T_1 =	160
C_p =	0.808		
P_s =	-16.6 "H_2O		28.32 "Hg
T_m =	76 °F		536 °R
T_s =	313 °F		773 °R

Moisture Content: %M = 7.21 M_d = 0.9279 MW_d = 30.384 MW = 29.49

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 64.151 \left[\frac{29.54 + \frac{0.494}{13.6}}{76 + 460}\right] = 62.478\ sft^3 = 0.390\ scfm$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 102.8 = 4.852 sft^3

$$\% \text{ Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{\quad}{62.478 +} \times 100 = 7.21\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{773}{28.32 \times 29.49}} \times 1.027 = 4091\ fpm$$

ACFM: 2,487,043

$$\%I = \frac{1{,}039 \times 62.478 \times 773}{4091 \times 28.32 \times 0.9279 \times 160 \times (0.177)^2} = 93.1\ \%$$

SCFM: 1,497,668

%EA: 39.1

Run Number 2

Unit Unit 3 Inlet Duct

Date 3-29-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
AK3	1152	199.75	1.40	0.66	0.66	10.00	270	264	263	58	78	77	259	
2	1157	202.17	0.95	0.44	0.44	9.50	288	262	262	58	77	75	261	
1	1202	204.28	0.95	0.44	0.44	9.50	290	261	259	58	79	78	262	
AH4	1207	206.30	0.65	0.31	0.31	8.50	295	262	262	59	76	74	264	
3	1212	208.08	0.70	0.33	0.33	8.50	294	261	262	58	76	75	263	Duct A - 16.7 f's
2	1217	210.31	1.30	0.60	0.60	10.00	295	263	260	57	78	76	262	
1	1222	212.44	1.30	0.60	0.60	10.00	305	261	260	57	78	79	262	
AE4	1227	214.50	1.00	0.46	0.46	9.00	318	259	258	57	75	74	264	
3	1232	216.28	0.94	0.44	0.44	9.50	326	258	258	57	75	74	263	
2	1237	218.29	1.10	0.51	0.51	10.00	326	258	257	56	74	74	263	
1	1242	220.40	1.10	0.51	0.51	10.00	327	258	255	56	75	75	265	
AB4	1247	222.10	1.00	0.46	0.46	9.00	334	256	255	58	74	74	265	
3	1252	224.13	1.00	0.46	0.46	9.00	339	256	256	58	74	73	265	
2	1257	226.09	1.00	0.46	0.46	9.00	334	257	258	59	73	73	265	
1	1302	227.99	1.00	0.46	0.46	9.00	338	257	258	59	73	73	265	
END	1307	229.401	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 G1B3.A
Job Name Epri
Run Number 3
Unit Unit 3 Inlet Duct
Date 3-29-00
Operator BROWN/BASS/Hefley
Sample Box No. Hg1 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 60
Assumed Moisture % 6.99
Probe Length 10'
C Factor 10 → 4.6 to reference
Initial Leak @ 15.00 "Hg = 0.000 cfm
Final Leak @ 12.50 "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	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
AB4	1345	231.398	0.98	0.45	0.45	7.00	337	250	251	52	59	57	251	Duct A
3	1350	233.47	1.20	0.56	0.56	8.00	339	250	253	54	60	59	253	CST
2	1355	235.65	1.10	0.51	0.51	8.00	334	253	256	54	61	60	264	Int. Orsat
1	1400	238.99	1.10	0.51	0.51	8.00	336	254	256	54	61	61	267	
AE4	1405	240.09	0.86	0.40	0.40	8.00	311	254	256	53	61	61	266	
3	1410	242.07	0.95	0.44	0.44	8.00	326	256	258	51	61	61	265	
2	1415	244.19	1.10	0.51	0.51	8.50	331	254	257	50	61	61	263	
1	1420	246.34	1.10	0.51	0.51	8.50	330	254	259	49	60	60	262	
AH4	1425	248.21	0.60	0.28	0.28	7.00	307	255	258	49	59	58	260	
3	1430	250.05	1.20	0.56	0.56	9.00	308	252	256	50	57	59	260	
2	1435	252.20	1.30	0.60	0.60	9.50	300	252	255	50	58	56	259	
1	1440	254.48	1.30	0.60	0.60	9.50	301	250	253	53	56	55	258	Duct A -16.3 P_s
AK4	1445	256.42	1.50	0.70	0.70	10.50	282	251	252	55	56	56	257	
3	1450	258.89	1.00	0.46	0.46	9.00	292	254	254	57	56	56	257	
2	1455	261.00	0.95	0.44	0.44	8.50	297	254	253	58	58	60	256	
1	1500	263.04	0.95	0.44	0.44	8.50	294	256	253	56	60	61	255	
END	1505	264.788	—	—	—	—	—	—	—	—	—	—	—	
BB4	1516	264.788	1.20	0.56	0.56	8.00	283	253	254	59	60	60	253	Duct B

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 67.202 ft^3
Water Collected V_w 121.7 ml
Time of Test T_t 160 min.
Stack Pressure P_s -16.2 "H_2O

Pitot Tube No. M3
Baro. Press. P_b 29.48 "Hg
Probe Tip Dia. D_n 0.177 in.
% CO_2 13.4 % CO 0.0
% O_2 4.2 % N_2 80.4
Area Stack A_s ~~43776~~ 37,552 in^2

Barometer No. 19-1 Probe Tip No. TFE1-6a
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 0.998 X 67.337

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

Impinger Box No. Hg 1

Impinger 1	Final Weight	839.9	Imp 8	Impinger 1	84.2
	Initial Weight	755.7	Final 862.8	Impinger 2	14.1
	Increase	84.2	Init. 849.3	Impinger 3	3.2
Impinger 2	Final Weight	768.1	13.5	Impinger 4	6.6
	Initial Weight	754.0		Impinger 5	-0.1
	Increase	14.1		Impinger 6	0.1
Impinger 3	Final Weight	760.8		Impinger 7	0.1
	Initial Weight	757.6		Imp 8	13.5
	Increase	3.2		Total	121.7 = V_w
Impinger 4	Final Weight	761.6			
	Initial Weight	755.0			
	Increase	6.6			
Impinger 5	Final Weight	756.3			
	Initial Weight	756.4			
	Increase	-0.1			
Impinger 6	Final Weight	758.9			
	Initial Weight	758.8			
	Increase	0.1			
Impinger 7	Final Weight	775.8			
	Initial Weight	775.7			
	Increase	0.1			

Water Weight Gain

V_w =

g SO_2 = -

V_w =

P_b =	29.48		%CO_2 =	13.4
V_m =	67.202		%O_2 =	4.2
V_w =	121.7		%CO =	0.0
P_m =	0.492		%N_2 =	80.4
Avg ΔP =	1.062		A_s =	43776 (47 552)
			D_n =	0.177
Avg$\sqrt{\Delta P}$ =	1.027		T_t =	160
C_p =	0.808			
P_s =	-16.2	"H_2O	28.29	"Hg
T_m =	64	°F	524	°R
T_s =	314	°F	774	°R

Moisture Content: %M = 7.92 M_d = 0.9208 MW_d = 30.392 MW = 29.41

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 67.202 \left[\frac{29.48 + \frac{0.492}{13.6}}{64 + 460}\right] = \frac{66.812}{0.418}\ \frac{sft^3}{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 121.7 = 5.744 sft^3

$$\% \text{ Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{5.744}{66.812 + 5.744} \times 100 = 7.92\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{774}{28.29 \times 29.41}} \times 1.027 = 4101 \text{ fpm}$$

ACFM: 2,493,355

$$\%I = \frac{1{,}039 \times 66.812 \times 774}{0.9208 \times 28.29 \times 4101 \times 160 \times (0.177)^2} = 100.3\ \%$$

SCFM: 1,486,340

%EA: 41.0

Run Number 3

Unit Unit 3 Inlet Duct

Date 3-29-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	P_m Pump Vacuum "Hg Guage	T_s Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	T_m Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
BB3	1521	267.23	1.30	0.60	0.60	9.00	291	253	254	59	60	59	254	
2	1526	269.67	1.10	0.51	0.51	9.00	300	255	253	60	59	59	256	
1	1531	272.02	1.00	0.46	0.46	8.50	290	257	254	60	58	59	257	
BE4	1536	273.87	0.90	0.42	0.42	8.00	324	258	254	58	58	60	258	Duct B -16.0 Pa
3	1541	276.04	1.10	0.51	0.51	8.00	316	257	254	59	60	62	257	
2	1546	278.20	1.10	0.51	0.51	8.00	312	259	254	59	62	67	257	
1	1551	280.29	1.30	0.60	0.60	9.00	314	260	255	60	67	70	255	
BH4	1556	282.11	0.70	0.33	0.33	8.00	336	260	254	60	70	71	257	
3	1601	284.00	0.90	0.42	0.42	8.00	341	260	255	61	72	77	258	
2	1606	285.94	1.00	0.46	0.46	8.50	313	260	253	60	74	78	256	
1	1611	288.05	1.00	0.46	0.46	8.50	322	261	255	60	74	77	257	
BK4	1616	289.88	1.00	0.46	0.46	8.50	329	260	255	59	75	77	257	
3	1621	292.10	1.10	0.51	0.51	9.00	323	259	255	55	75	79	256	
2	1626	294.32	1.10	0.51	0.51	9.00	321	257	254	57	74	77	254	
1	1631	296.61	1.00	0.46	0.46	9.00	312	256	255	58	73	76	253	
END	1636	298.735	–	–	–	–	–	–	–	–	–	–	–	

METCO ENVIRONMENTAL

Job Number 99-95 G1B3.A
Job Name Epri
Run Number 4
Unit Unit 3 Inlet Duct
Date 3:29-00
Operator Brown/Bass/Hefley
Sample Box No. Hg4 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 60
Assumed Moisture % 6.99
Probe Length 10'
C Factor 10→4.6 to reference
Initial Leak @ 15.00 "Hg = 0.000 cfm
Final Leak @ 10.00 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
BK4	1710	300.805	1.20	0.56	0.56	7.50	339	250	252	61	61	59	251	Duct B
3	1715	303.38	1.10	0.51	0.51	7.50	338	254	252	61	60	59	251	CST
2	1720	305.60	1.00	0.46	0.46	7.00	341	256	254	60	60	59	253	Int. Orsat
1	1725	307.79	1.00	0.46	0.46	7.00	343	258	256	58	60	60	254	
BH4	1730	309.73	0.72	0.34	0.34	6.00	330	259	256	58	60	60	255	
3	1735	311.60	0.90	0.42	0.42	7.00	335	260	256	59	60	60	256	
2	1740	314.00	1.00	0.46	0.46	7.00	308	259	255	59	60	61	257	
1	1745	316.10	1.10	0.51	0.51	7.00	327	257	255	59	60	62	257	
END	1750	317.845	—	—	—	—	—	—	—	—	—	—	—	standby for stack
BE4	1825	317.845	0.80	0.37	0.37	6.00	312	256	255	58	60	59	253	
3	1830	320.01	1.20	0.56	0.56	7.00	308	254	255	58	60	60	253	Ps -16.5
2	1835	322.24	1.20	0.56	0.56	7.00	290	254	254	58	59	60	253	
1	1840	324.47	1.20	0.56	0.56	7.00	281	254	253	57	59	61	253	
BB4	1845	326.59	1.10	0.51	0.51	7.50	282	253	253	57	59	62	253	
3	1850	328.86	1.10	0.51	0.51	7.50	280	255	253	56	59	63	252	
2	1855	331.08	1.00	0.46	0.46	7.00	285	258	257	56	59	63	252	
1	1900	333.11	1.00	0.46	0.46	7.00	298	256	260	57	60	64	252	
END	1905	334.856	—	—	—	—	—	—	—	—	—	—	—	

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 67.599 ft³
Water Collected V_w 115.5 ml
Time of Test T_t 160 min.
Stack Pressure P_s -16.5 "H₂O

Pitot Tube No. M3
Baro. Press. P_b 29.42 "Hg
Probe Tip Dia. D_n 0.177 in.
% CO_2 13.4 % CO 0.0
% O_2 6.2 % N_2 80.4
Area Stack A_s ~~43996~~ 87552 in²

Barometer No. 19-1 Probe Tip No. TFE1-69
Total Volume of Leak Checks After Start: — ft³
V_m = Dry Gas Meter Calibration Factor 0.998 X 67.730

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

Impinger Box No. Hg 4

Impinger 1	Final Weight	831.0	
	Initial Weight	748.7	
	Increase		
Impinger 2	Final Weight	770.5	
	Initial Weight	757.5	
	Increase		
Impinger 3	Final Weight	767.4	
	Initial Weight	764.6	
	Increase		
Impinger 4	Final Weight	771.1	
	Initial Weight	764.9	
	Increase		
Impinger 5	Final Weight	754.9	
	Initial Weight	754.9	
	Increase		
Impinger 6	Final Weight	742.5	
	Initial Weight	742.2	
	Increase		
Impinger 7	Final Weight	760.8	
	Initial Weight	761.1	
	Increase		

Water Weight Gain

Imp 8 Final 830.0
Int. 818.7

V_w =
g SO_2 = -
V_w =

Impinger 1	82.3
Impinger 2	13.0
Impinger 3	2.8
Impinger 4	6.2
Impinger 5	0.0
Impinger 6	0.3
Impinger 7	-0.3
Imp. 8	11.2
Total	115.5 = V_w

P_b =	29.42	%CO_2 =	13.4
V_m =	~~67.594~~ 67.595	%O_2 =	6.2
V_w =	115.5	%CO =	0.0
P_m =	0.497	%N_2 =	80.4
Avg ΔP =	1.071	A_s =	43776 (87552)
		D_n =	0.177
Avg$\sqrt{\Delta P}$ =	1.033	T_t =	160
C_p =	0.808		
P_s =	-16.5 "H_2O		28.21 "Hg
T_m =	61 °F		521 °R
T_s =	311 °F		771 °R

Moisture Content: %M = 7.48 M_d = 0.9252 MW_d = 30.392 MW = 29.47

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times \overset{67.595}{\cancel{67.594}} \left[\frac{29.42 + \frac{0.497}{13.6}}{61 + 460}\right] = \begin{matrix} 67.453 \\ \cancel{67.452} \\ 0.422 \end{matrix} \begin{matrix} \\ \text{sft}^3 \\ \text{scfm} \end{matrix}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 115.5 = 5.452 sft^3

$$\%\ \text{Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{5.452}{67.453 + 5.452} \times 100 = 7.48\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{771}{28.21 \times 29.47}} \times 1.033 = 4119\ \text{fpm}$$

ACFM: ~~1252025~~ 2504050

$$\%I = \frac{1{,}039 \times 67.452 \times 771}{0.9252 \times 28.21 \times 4119 \times 160 \times (0.177)^2} = 100.3\ \%$$

SCFM: 1501576

%EA: 41.0

Run Number 4

Unit Unit 3 Inlet Duct

Date 3-29-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line °F	Remarks
AK4	1926	334.856	1.40	0.66	0.66	8.00	271	260	258	58	60	61	252	Duct A
3	1931	337.44	1.10	0.51	0.51	7.50	282	260	258	58	59	60	252	
2	1936	339.63	0.90	0.42	0.42	7.00	289	260	258	56	59	60	252	
1	1941	341.61	0.90	0.42	0.42	7.00	287	259	258	56	59	62	251	
AH4	1946	343.44	1.10	0.51	0.51	7.50	300	258	257	56	60	63	251	-16.5 Pa
3	1951	345.54	1.10	0.51	0.51	7.50	301	258	255	55	61	64	251	
2	1956	347.71	1.20	0.56	0.56	8.00	312	256	255	56	61	65	253	
1	2001	349.91	1.30	0.60	0.60	8.00	309	257	255	56	61	64	253	
AE4	2006	351.91	0.95	0.44	0.44	7.00	314	256	256	56	61	65	253	
3	2011	353.87	1.00	0.46	0.46	7.50	322	254	255	55	60	64	252	
2	2016	355.97	1.10	0.51	0.51	7.50	324	254	254	55	60	64	253	
1	2021	358.11	1.10	0.51	0.51	7.50	323	253	255	56	60	64	254	
AB4	2026	360.00	1.10	0.51	0.51	7.50	327	252	253	57	61	64	253	
3	2031	362.11	1.20	0.56	0.56	8.00	331	252	253	57	60	64	253	
2	2036	364.32	1.10	0.51	0.51	7.50	337	252	255	58	60	64	252	
1	2041	366.49	1.10	0.51	0.51	7.50	336	252	254	57	60	64	251	
END	2046	368.535	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-956IB3A
Job Name Epri
Run Number 1
Unit Unit 3 Stack
Date 3-29-00
Operator Hoth / Blair / Hesley
Sample Box No. Hg5 Meter Box No. 2/2

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 53
Assumed Moisture % 7.5
Probe Length 12'
C Factor 2.0 → 1.0 to reference
Initial Leak @ 15.0" "Hg = 0.000 cfm
Final Leak @ - "Hg = - cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
A4	0738	19.598	0.83	0.42	0.42	4.5	300	270	275	46	65	63	280	
4	0740	21.45	0.85	0.44	0.44	4.5	299	270	273	50	64	64	288	
3	0745	23.32	0.85	0.44	0.44	4.5	299	272	270	53	64	64	285	
3	0750	25.19	0.85	0.44	0.44	4.5	301	272	271	52	65	65	283	
2	0755	27.06	0.82	0.41	0.41	4.5	301	272	271	52	65	65	285	
2	0800	28.89	0.85	0.44	0.44	4.5	301	274	274	50	65	65	290	
1	0805	30.78	0.83	0.42	0.42	4.5	298	274	274	50	66	66	288	
1	0810	32.68	0.83	0.42	0.42	4.5	298	273	272	50	66	66	288	
End	0815	34.546	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 6.0" to 34.608 0.000
B4	0822	34.675	0.96	0.49	0.49	5.0	327	277	279	53	66	66	293	Leak ✓ @ 6.0" to 34.675 0.000
4	0827	36.66	0.92	0.46	0.46	5.0	334	277	278	53	66	66	293	
3	0832	38.78	0.98	0.50	0.50	5.0	330	275	282	54	67	68	293	
3	0837	40.58	0.96	0.49	0.49	5.0	330	275	282	54	67	68	293	
2	0842	42.60	0.98	0.50	0.50	5.0	332	276	281	52	67	68	290	
2	0847	44.59	0.95	0.47	0.47	5.0	330	276	285	52	67	68	290	
1	0852	46.58	0.92	0.46	0.46	5.0	329	276	285	52	67	68	289	
1	0857	48.53	0.95	0.47	0.47	5.0	329	275	285	52	67	68	289	
End	0902	50.436	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 7.0" to 50.512 0.000

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m — ft^3
Water Collected V_w - ml
Time of Test T_t 160 min.
Stack Pressure P_s -1.50 "H_2O

Pitot Tube No. M4
Baro. Press. P_b 29.30 "Hg
Probe Tip Dia. D_n 0.174 in.
% CO_2 - % CO -
% O_2 - % N_2 -
Area Stack A_s 115.172 in^2

Barometer No. 19-1
Probe Tip No. TFE 1-6
Total Volume of Leak Checks After Start: - ft^3
V_m = Dry Gas Meter Calibration Factor 1.028 X -

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

Run Number 1

Unit Units 3 Stack

Date 3-29-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Heated Line	Remarks
64	0908	50.579	0.80	0.41	0.41	3.0	310	280	275	52	67	68 390	290	Leak ✓ @ 7.0" to 50.579 0.000
4	0913	52.48	0.81	0.42	0.42	3.0	310	280	275	52	67	68	290	
3	0918	54.45	0.81	0.42	0.42	3.0	310	280	275	52	67	68	290	
3	0923	56.47	0.82	0.43	0.43	3.5	320	278	273	53	67	68	290	
2	0928	58.31	0.80	0.41	0.41	3.0	320	278	273	53	67	69	288	
2	0933	60.30	0.80	0.41	0.41	3.0	320	278	273	53	68	69	288	
1	0938													

ABORTED

METCO ENVIRONMENTAL

Job Number 99-95GIB3A
Job Name EPRI
Run Number 2
Unit Unit 3 Stack
Date 3-29-00
Operator Hatt / Lee / Hayley
Sample Box No. #6 / 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 58
Assumed Moisture % 7.5
Probe Length 12'
C Factor 2.0 → 1.0 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" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
04	1015	62.406	0.82	0.41	0.41	5.0	320	275	271	60	68	70	290	Soot Blowing
4	1020	63.35	0.82	0.41	0.41	5.0	322	274	270	61	68	70	292	Entire Run
3	1025	66.30	0.82	0.41	0.41	5.0	324	274	270	61	68	70	292	
3	1030	68.27	0.85	0.44	0.44	5.0	325	273	270	61	68	70	293	
2	1035	70.29	0.85	0.44	0.44	5.0	310	273	270	61	68	70	293	
2	1040	72.21	0.85	0.44	0.44	5.0	310	273	267	58	68	70	293	
1	1045	74.17	0.85	0.44	0.44	5.0	306	274	266	56	68	70	292	
1	1050	76.11	0.85	0.44	0.44	5.0	306	274	266	56	68	70	292	0.062
End	1055	78.019	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 7.0 to 78.081 0.000
C4	1101	78.168	0.85	0.44	0.44	5.0	300	274	270	56	68	68	297	Leak ✓ @ 7.0 to 78.168 0.000
4	1106	80.10	0.86	0.45	0.45	5.0	302	274	270	57	68	69	298	0.687
3	1111	82.19	0.85	0.44	0.44	5.0	302	274	270	57	68	69	300	
3	1116	83.95	0.87	0.45	0.45	5.0	304	275	267	59	68	69	300	
2	1121	85.93	0.85	0.44	0.44	5.0	304	275	266	55	68	69	299	
2	1126	87.90	0.85	0.44	0.44	5.0	305	275	267	54	68	69	299	
1	1131	89.86	0.86	0.45	0.45	5.0	305	274	270	54	67	69	300	
1	1136	91.83	0.86	0.45	0.45	5.0	307	274	275	54	67	69	300	0.098
End	1141	93.753	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 7.0 to 93.851 0.000

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m ~~66.107~~ ft^3 65.840
Water Collected V_w ~~64.7~~ 91.7 ml
Time of Test T_t 160 min.
Stack Pressure P_s −1.40 "H_2O

Pitot Tube No. 594
Baro. Press. P_b 29.34 "Hg
Probe Tip Dia. D_n 0.174 in.
% CO_2 10.6 % CO 0.0
% O_2 9.2 % N_2 80.2
Area Stack A_s 115.172 in^2

Barometer No. 19-1
Probe Tip No. T FE I-6
Total Volume of Leak Checks After Start: ~~0.727~~ ft^3 0.486
V_m = Dry Gas Meter Calibration Factor 1.028 X 64.306
64.047

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

Impinger Box No. Mg 6 (BH)

Impinger 1	Final Weight	~~682.8~~ 707.8	
	Initial Weight	650.8	
	Increase	57.0	
Impinger 2	Final Weight	758.0	
	Initial Weight	743.2	
	Increase	14.8	
Impinger 3	Final Weight	729.7	
	Initial Weight	727.3	
	Increase	2.4	
Impinger 4	Final Weight	751.1	
	Initial Weight	745.4	
	Increase	5.7	
Impinger 5	Final Weight	654.5	
	Initial Weight	654.4	
	Increase	0.1	
Impinger 6	Final Weight	656.0	
	Initial Weight	655.5	
	Increase	0.5	
Impinger 7	Final Weight	674.1	
	Initial Weight	674.1	
	Increase	0.0	

Water Weight Gain

Imp 8 946.7
Final 935.5
Int. 11.2

V_w =
g SO_2 = -
V_w =

Impinger 1	~~32.0~~ 57.0
Impinger 2	14.8
Impinger 3	2.4
Impinger 4	5.7
Impinger 5	0.1
Impinger 6	0.5
Impinger 7	0.0
Imp 8	11.2
Total	91.7 ~~66.7~~ = V_w

P_b =	29.34	%CO_2 =	10.6
V_m =	~~66.107~~ 65.840	%O_2 =	9.2
V_w =	~~66.7~~ 91.7	%CO =	0.0
P_m =	0.462	%N_2 =	80.2
Avg ΔP =	0.904	A_s =	115.172
		D_n =	0.174
Avg$\sqrt{\Delta P}$ =	0.950	T_t =	160
C_p =	0.808		
P_s =	-1.40 "H_2O	29.24 "Hg	
T_m =	70 °F	530 °R	
T_s =	309 °F	769 °R	

Moisture Content: %M = ~~4.64~~ ~~6.27~~ ~~6.20~~ 6.30 M_d = ~~0.9536~~ ~~0.9373~~ 0.9380 0.9370 MW_d = 30.064 MW = ~~29.50~~ ~~29.32~~ 29.30

$$Vm_{std} = 17.65\ Vm\left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times \text{~~66.107~~ 65.840}\left[\frac{29.34 + \frac{0.462}{13.6}}{70 + 460}\right] = \text{~~65.447~~ 64.405 sft}^3$$

~~64.666~~ sft³ ~~0.404~~ scfm ~~0.409~~ 0.403

Vw_{gas} = 0.0472 x Vw = 0.0472 x ~~66.7~~ 91.7 = ~~3.148~~ 4.328 sft³ ~~6.27~~ ~~6.20~~ 6.30

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{3.148}{3.148 + \text{~~64.666~~ 65.447}}$ x 100 = ~~4.64~~ % 2,980,247 ~~2,979,230~~ ~~2,979,734~~

V_s = 5123.8 x 0.808 $\sqrt{\frac{769}{29.24 \times 29.50}}$ x 0.950 = ~~3714~~ ~~3725~~ 3726 fpm

64.405 ~~65.447~~ 29.30

ACFM: ~~2,970,127~~ 1,882,054 ~~1,881,155~~

%I = $\frac{1{,}039 \times \text{~~64.666~~} \times 769}{\text{~~3714~~ 3725 3726} \times 29.24 \times \text{~~0.9536~~ ~~0.9373~~ ~~0.9380~~ 0.9370} \times 160 \times (0.174)^2}$ = ~~104.4~~ ~~103.0~~ ~~105.7~~ 104.1 %

SCFM: ~~1,907,705~~ 1,880,553

%EA: 76.3

Run Number 2

Unit Unit 3 Stack

Date 3-29-00

Hg

FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Heated Line	Remarks
B4	1147	93.922	0.98	0.50	0.50	5.5	310	270	276	56	69	70 300	Leak ✓ @ 7.0 to 93.922	0.071
4	1152	96.01	0.98	0.50	0.50	5.5	310	270	276	56	69	70	300	
3	1157	98.12	0.99	0.50	0.50	5.5	311	270	276	56	68	70	299	
3	1202	100.18	0.99	0.50	0.50	5.5	309	272	272	54	70	72	299	
2	1207	102.27	0.99	0.50	0.50	5.5	309	272	275	54	70	72	298	
2	1212	104.42	0.99	0.50	0.50	5.5	307	273	274	54	70	72	299	
1	1217	106.80	0.99	0.50	0.50	5.5	307	273	274	54	70	72	299	
1	1222	108.55	0.95	0.48	0.48	5.5	307	273	274	54	70	72	298	0.099
End	1227	110.815	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 7.0 to 110.914
A4	1232	110.983	0.90	0.46	0.46	5.0	309	270	274	54	70	73	298	Leak ✓ @ 7.0 to 110.983
4	1237	112.99	0.94	0.48	0.48	5.0	309	272	275	54	71	73	297	0.069
3	1242	114.98	0.95	0.48	0.48	5.5	308	272	275	55	70	73	297	
3	1247	117.02	0.95	0.48	0.48	5.5	309	273	275	55	70	73	298	
2	1252	119.00	0.94	0.48	0.48	5.0	310	274	273	53	70	73	299	
2	1257	120.98	0.94	0.48	0.48	5.0	310	275	271	53	70	73	299	
1	1302	123.99	0.94	0.48	0.48	5.0	310	275	271	53	71	74	300	
1	1307	124.98	0.95	0.48	0.48	5.0	309	276	270	53	71	74	300	
End	1312	126.939	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95GIB3A
Job Name EPRI
Run Number 3
Unit Unit 3 Stack
Date 3-29-00
Operator Todd Lee / Harley
Sample Box No. Hg 2 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 68
Assumed Moisture % 7.5
Probe Length 12
C Factor 2.0 → 1.0 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	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	~~Heated~~ Line	Remarks
A4	1345	128.362	0.93	0.47	0.47	5.0	300	270	271	57	66	68	300	
4	1350	130.16	0.93	0.47	0.47	5.0	303	270	271	58	66	68	300	
3	1355	132.22	0.92	0.46	0.46	5.0	306	273	270	58	66	68	301	
3	1400	134.19	0.92	0.46	0.46	5.0	306	274	275	60	66	68	300	
2	1405	136.14	0.94	0.48	0.48	5.0	307	275	275	60	63	66	300	
2	1410	138.15	0.93	0.47	0.47	5.0	307	275	275	60	63	66	299	
1	1415	140.15	0.93	0.47	0.47	5.0	308	273	277	60	63	65	299	
1	1420	142.14	0.93	0.47	0.47	5.0	308	273	277	60	63	65	299	0.090
End	1425	144.109	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 7.0 to 144.199 0.000
B4	1430	144.284	0.99	0.50	0.50	5.0	306	274	279	59	63	65	300	Leak ✓ @ 7.0 to 144.284 0.000
4	1435	146.10	0.99	0.50	0.50	5.0	306	274	279	59	63	65	298	0.085
3	1440	147.67	0.99	0.50	0.50	5.0	309	274	281	58	63	65	299	
3	1445	149.60	0.99	0.50	0.50	~~5.0~~ 10.0	310	276	281	57	63	65	299	
2	1450	151.63	0.99	0.50	0.50	10.0	310	275	281	56	63	65	298	
2	1455	153.58	0.99	0.50	0.50	10.0	309	275	279	54	63	65	298	
1	1500	155.59	0.99	0.50	0.50	10.0	310	275	279	54	63	65	298	
1	1505	157.58	0.99	0.50	0.50	10.0	310	275	279	54	63	65	298	0.094
End	1510	159.584	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 12 to 159.678 0.000

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m ~~64.559~~ ft^3 64.333
Water Collected V_w 102.0 ml
Time of Test T_t 160 min.
Stack Pressure P_s −1.50 "H_2O

Pitot Tube No. M-4
Baro. Press. P_b 29.28 "Hg
Probe Tip Dia. D_n 0.174 in.
% CO_2 10.8 % CO 0.0
% O_2 8.8 % N_2 80.4
Area Stack A_s 115.172 in^2

Barometer No. 19-1 Probe Tip No. TFE I-6
Total Volume of Leak Checks After Start: ~~0.293~~ ft^3 0.513
V_m = Dry Gas Meter Calibration Factor 1.028 X ~~62.801~~ 62.581

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

Impinger Box No. Hg 2

Impinger 1	Final Weight	819.9	
	Initial Weight	750.5	
	Increase	69.4	
Impinger 2	Final Weight	773.1	
	Initial Weight	760.7	
	Increase	12.4	
Impinger 3	Final Weight	757.0	
	Initial Weight	754.4	
	Increase	2.6	
Impinger 4	Final Weight	758.3	
	Initial Weight	753.1	
	Increase	5.2	
Impinger 5	Final Weight	767.8	
	Initial Weight	767.8	
	Increase	0.0	
Impinger 6	Final Weight	758.3	
	Initial Weight	758.0	
	Increase	0.3	
Impinger 7	Final Weight	647.0	
	Initial Weight	647.0	
	Increase	0.0	

Water Weight Gain

Imp 8
Final 858.7
Int. 846.6
12.1

V_w =
g SO_2 = -
V_w =

Impinger 1	69.4
Impinger 2	12.4
Impinger 3	2.6
Impinger 4	5.2
Impinger 5	0.0
Impinger 6	0.3
Impinger 7	0.0
Imp 8	12.1
Total	102.0 = V_w

P_b = 29.28
V_m = ~~64.559~~ 64.333
V_w = 102.0
P_m = 0.455
Avg ΔP = 0.896
Avg$\sqrt{\Delta P}$ = 0.946
C_p = 0.808
P_s = -1.50 "H_2O
T_m = ~~68~~ 69 °F
T_s = 310 °F

%CO_2 = 10.8
%O_2 = 8.8
%CO = 0.0
%N_2 = 80.4
A_s = 115,172
D_n = 0.174
T_t = 160

29.17 "Hg
~~528~~ 529 °R
770 °R

Moisture Content: %M = ~~7.07~~ 7.11 M_d = ~~0.9293~~ 0.9289 MW_d = 30.080 MW = ~~29.23~~ 29.22

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65\ \cancel{\times 64.559}\ 64.333 \left[\frac{29.28 + \frac{0.455}{13.6}}{\cancel{68}\ 69 + 460}\right] = \cancel{63.261}\ 62.920\ \text{sft}^3 = \cancel{0.395}\ 0.393\ \text{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 102.0 = 4.814 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{4.814}{63.261 + 4.814}$ x 100 = ~~7.07~~ 7.11 %

V_s = 5123.8 x 0.808 $\sqrt{\frac{770}{29.17 \times \cancel{29.25}\ 29.22}}$ x 0.946 = 3722 fpm

ACFM: ~~2,976,746~~ 2,977,256
SCFM: ~~1,856,222~~ 1,855,424

%I = $\frac{1{,}039 \times 770 \times \cancel{63.261}\ 62.920}{3722 \times \cancel{0.9293}\ 0.9289 \times 29.17 \times 160 \times (0.174)^2}$ = ~~103.6~~ 103.0 %

%EA: 70.4

Run Number 3

Unit Unit 3 Stack

Date 3-29-00

Hg / FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
C4	1516	158.796	0.85	0.44	0.44	6.0	315	270	280	55	71	70	300	Leak ✓ @12 to 158.796 0.000
4	1521	160.78	0.80	0.40	0.40	5.0	315	270	280	55	71	70	300	0.118
3	1526	163.95	0.80	0.40	0.40	5.0	313	268	279	55	72	72	299	
3	1531	165.53	0.83	0.42	0.42	5.0	313	268	279	55	72	72	299	
2	1536	167.48	0.80	0.40	0.40	5.0	312	269	278	55	73	72	298	
2	1541	169.44	0.85	0.44	0.44	5.0	312	270	280	52	73	72	298	
1	1546	171.45	0.80	0.40	0.40	5.0	312	270	280	52	73	72	295	
1	1551	173.48	0.80	0.40	0.40	5.0	315	269	281	52	73	72	295	0.036
End	1556	175.490	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @12 to 175.526 0.000
D4	1602	175.1016	0.83	0.42	0.42	5.0	310	273	280	53	73	72	290	Leak ✓ @12 to 175.1016 0.000
4	1607	177.59	0.85	0.44	0.44	5.0	310	273	280	52	73	72	290	0.090
3	1612	179.59	0.85	0.44	0.44	5.0	311	274	282	51	75	75	292	
3	1617	181.60	0.85	0.44	0.44	5.0	313	274	282	51	75	75	292	
2	1622	183.59	0.85	0.44	0.44	5.0	312	272	282	50	75	75	295	
2	1627	185.58	0.85	0.44	0.44	5.0	312	270	281	50	75	75	294	
1	1632	187.61	0.86	0.45	0.45	5.0	312	270	281	50	75	75	294	
1	1637	189.53	0.85	0.44	0.44	5.0	312	270	281	50	75	75	294	
End	1642	191.456	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 GIG 3A
Job Name Epri
Run Number 4
Unit Unit 3 Stack
Date 3-29-00
Operator Herb / Lee / Harley
Sample Box No. Hg5 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 % 7.5
Probe Length 12
C Factor 2.0→1.0 to reference
Initial Leak @ 15.0" "Hg = 0.000 cfm
Final Leak @ 8.0" "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks	
D4	1710	192.863	0.88	0.45	0.45	5.0	310	270	275	55	69	70	295		
4	1715	194.75	0.85	0.44	0.44	5.0	310	270	275	55	69	70	295		
3	1720	196.30	0.85	0.44	0.44	5.0	310	270	277	55	67	70	296	196.643 pump off 1723	
3	~~1725~~ 1822	197.64	0.80	0.40	0.40	5.0	310	270	270	53	62	63	290	pump on 1805	
2	1812	199.60	0.85	0.44	0.44	5.0	305	280	275	53	63	64	290	Δ heated line	0.078
2	1817	201.55	0.85	0.44	0.44	5.0	307	280	278	51	62	63	296	leak ✓ to 196.741	
1	1822	203.50	0.85	0.44	0.44	5.0	309	282	280	51	62	63	296		
1	1827	205.44	0.84	0.43	0.43	5.0	310	282	282	51	62	62	~~298~~ 297		
End	1832	207.374	—	—	—	—	—	—	—	—	—	—	—	leak ✓ @ 7.0 to 207.502 0.000	
C4	1840	207.801	0.84	0.43	0.43	5.0	311	282	284	53	62	62	297	Leak ✓ @ 7.0 to 207.801 0.000	0.427
4	1845	209.48	0.80	0.40	0.40	5.0	313	285	288	53	61	61	296		
3	1850	211.35	0.80	0.40	0.40	5.0	313	285	288	53	61	61	296		
3	1855	213.24	0.80	0.40	0.40	5.0	313	285	288	51	61	61	298		
2	1900	215.08	0.80	0.40	0.40	5.0	311	286	290	51	61	61	297		
2	1905	216.95	0.80	0.40	0.40	5.0	311	286	290	51	61	61	298		
1	1910	218.85	0.80	0.40	0.40	5.0	314	286	289	51	61	61	298		
1	1915	220.76	0.80	0.40	0.40	5.0	314	286	289	51	61	61	298		
End	1920	222.630	—	—	—	—	—	—	—	—	—	—	—	leak ✓ @ 7.0 to 222.745 0.000	0.274

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m ~~63.289~~ 62.899 ft³
Water Collected V_w 82.6 ml
Time of Test T_t 160 min.
Stack Pressure P_s -1.50 "H₂O

Pitot Tube No. MM
Baro. Press. P_b 29.22 "Hg
Probe Tip Dia. D_n 0.174 in.
% CO_2 10.5 % CO 0
% O_2 9.1 % N_2 80.4
Area Stack A_s 115.172 in²

Barometer No. 19-1
Probe Tip No. TFE 1-6
Total Volume of Leak Checks After Start: ~~0.572~~ 0.990 ft³ 61.147
V_m = Dry Gas Meter Calibration Factor 1.028 X ~~61.565~~

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

Impinger Box No. Hg 5

Impinger 1	Final Weight	807.8	
	Initial Weight	756.9	
	Increase		
Impinger 2	Final Weight	763.6	
	Initial Weight	750.0	
	Increase		
Impinger 3	Final Weight	678.5	
	Initial Weight	676.5	
	Increase		
Impinger 4	Final Weight	764.0	
	Initial Weight	759.1	
	Increase		
Impinger 5	Final Weight	767.9	
	Initial Weight	767.9	
	Increase		
Impinger 6	Final Weight	763.6	
	Initial Weight	763.7	
	Increase		
Impinger 7	Final Weight	764.4	
	Initial Weight	764.6	
	Increase		

Water Weight Gain

Imp 8
Final 881.9
Int. 870.4

V_w =
g SO_2 = -
V_w =

Impinger 1	50.9
Impinger 2	13.6
Impinger 3	2.0
Impinger 4	4.9
Impinger 5	0
Impinger 6	-0.1
Impinger 7	-0.2
Imp 8	11.5
Total	82.6 = V_w

P_b = 29.22
V_m = ~~63.289~~ 62.859
V_w = 82.6
P_m = 0.458
Avg ΔP = ~~0.905~~ 0.904
Avg$\sqrt{\Delta P}$ = 0.950
C_p = 0.808
P_s = -1.50 "H_2O 29.11 "Hg
T_m = 62 °F 522 °R
T_s = 314 °F 774 °R

%CO_2 = 10.5
%O_2 = 9.1
%CO = 0
%N_2 = 80.4
A_s = 115.172
D_n = 0.174
T_t = 160

Moisture Content: %M = 5.90 M_d = 0.9410 MW_d = 30.044 MW = 29.33

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 62.859 \left[\frac{29.22 + \frac{0.458}{13.6}}{62 + 460}\right] = 62.176\ \text{sft}^3 = 0.389\ \text{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 82.6 = 3.899 sft^3

$$\%\ \text{Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{3.899}{62.176 + 3.899} \times 100 = 5.90\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{774}{29.11 \times 29.33}} \times 0.950 = 3745\ \text{fpm}$$

ACFM: 2995056

SCFM: 1877564

$$\%I = \frac{1{,}039 \times 774 \times 62.176}{160 \times 0.9410 \times 29.11 \times 3745 \times (0.174)^2} = 100.6\ \%$$

%EA: 74.6

Run Number 4

Unit Unit 3 Stack

Date 3-29-00

Hg

FIELD DATA

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
			ΔP_s		P_m		T_s				T_m			
B4	1926	222.904	0.95	0.48	0.48	5.5	315	270	283	51	61	61	296	Leak ✓ @ 7.0 to 222.904 0.000
4	1931	224.85	0.99	0.50	0.50	6.0	315	270	283	52	61	61	296	
3	1936	226.87	0.99	0.50	0.50	6.0	320	272	287	52	61	61	296	
3	1941	228.87	0.95	0.48	0.48	5.5	320	272	287	52	61	61	297	
2	1946	230.88	0.99	0.50	0.50	6.0	318	274	287	52	61	61	297	
2	1951	232.90	0.99	0.50	0.50	6.0	318	274	287	52	61	61	297	
1	1956	234.87	0.99	0.50	0.50	6.0	319	275	288	52	62	60	298	
1	2001	236.86	0.99	0.50	0.50	6.0	319	275	288	52	62	60	298	
End	2006	238.828	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 8.0 to 238.925 0.000
A4	2012	239.039	0.99	0.50	0.50	6.0	320	270	284	56	61	61	296	Leak ✓ @ 8.0 to 239.039 0.000
4	2017	241.07	0.99	0.50	0.50	6.0	320	270	284	56	61	61	296	
3	2022	243.08	0.99	0.50	0.50	6.0	322	270	285	56	62	61	298	
3	2027	245.09	0.98	0.50	0.50	6.0	320	269	285	56	61	61	297	
2	2032	247.09	0.98	0.50	0.50	6.0	320	269	285	57	61	61	297	
2	2037	249.09	0.98	0.50	0.50	6.0	316	267	286	55	61	61	297	
1	2042	251.10	0.98	0.50	0.50	6.0	315	267	286	55	61	61	296	
1	2047	253.14	0.98	0.50	0.50	6.0	315	265	286	55	61	61	297	
End	2052	255.000	—	—	—	—	—	—	—	—	—	—	~~297~~	

0.211

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-95 GIB 3A

Job Name Epri

Sampling Location Unit 3 Inlet Duct

Date 3-28-00 Time 1330

Stack Height 83 ft.

Sampling Port Height Above Ground 83 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)					125
Port & Wall Thickness (in.)					29
Inside Stack Diameter (in.)					96 X 456 x2

Sampling Ports are ~~25~~ 24 ft. 11 in. (1.88 eq. duct ~~stack~~ diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are ~~22~~ 21 ft. 7 in. (1.63 eq. duct 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.)	BG Port ~~A~~ $\Delta P/T_s/\alpha$	BE Port ~~B~~ $\Delta P/T_s/\alpha$	BH Port ~~C~~ $\Delta P/T_s/\alpha$	BK Port ~~D~~ $\Delta P/T_s/\alpha$
1			12	.92245	.93329	1.20349	1.20346
2			36	.85306	.97329	.87344	.82359
3			60	1.10243	.92316	.71345	.86359
4			34	1.10274	.60308	.57329	.95335
5				/ /	/ /	/ /	/ /
6				PORT 1 AB	Port AE	Port 1 AH	Port 1 AK
7				1.00339	.84323	.90 3001	.72291
8				.91 335	.79324	.90 2971	.70 2869
9				.95 333	.70 324	.80 2981	.69 2811
10				.81 339	.45 309	.48 2924	.99 2701
11				/ /	/ /	/ /	/ /
12				/ /	/ /	/ /	/ /
13				/ /	/ /	/ /	/ /
14				/ /	/ /	/ /	/ /
15				/ /	/ /	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. 1112

C_p = 0.810

P_b = 29.20 "Hg

P_s = -16.0 "H_2O 28.02 "Hg

A_s = 43776 in.^{2} (87,552)

Average ΔP ~~0.856~~ 0.857

Average $\Delta P^{1/2}$ 0.920

Average T_x 316 °F 776

Average α — degrees

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-956IB39

Job Name EPRI

Sampling Location Unit 3 Stack

Date 3-28-00 Time 1545

Stack Height 504' 11 1/2" ft.

Sampling Port Height Above Ground 252' 6 1/2" ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)					
Port & Wall Thickness (in.)	43"	47	43	49	45 1/2
Inside Stack Diameter (in.)					382 15/16

Sampling Ports are 155 ft. 8 in. (4.88 stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 252 ft. 5 in. (7.91 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	~~2.6~~ 3.2	12.254	12 1/4"	0.77 / 255 /	0.79 / 260 /	0.79 / 265 /	0.80 / 260 /
2	~~8.2~~ 10.5	40.208	40 3/16"	0.90 / 270 /	0.90 / 270 /	0.92 / 280 /	0.90 / 275 /
3	~~14.6~~ 19.4	74.290	74 5/16"	0.93 / 292 /	0.93 / 290 /	0.90 / 280 /	0.92 / 270 /
4	~~22.6~~ 32.3	123.689	123. 11/16	0.93 / 290 /	0.92 / 280 /	0.89 / 289 /	0.92 / 291 /
5	~~34~~			/ /	/ /	/ /	/ /
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
10	* calculated as an 1/8"			/ /	/ /	/ /	/ /
11	of an 8-point			/ /	/ /	/ /	/ /
12	Traverse			/ /	/ /	/ /	/ /
13				/ /	/ /	/ /	/ /
14				/ /	/ /	/ /	/ /
15				/ /	/ /	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M-4

C_p = 0.808

P_b = 29.00 "Hg

P_s = -1.50 "H_2O 28.89 "Hg

A_s = 115,172 in.^{2}

Average ΔP 0.882

Average $\Delta P^{1/2}$ 0.939

Average T_x 279 °F

Average α — degrees

METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-95GI33A Sample Location: Unit 3 Precipitator Inlet

Job Name: EPRI - Cinergy Analytical Method: 3B

Location: Owensville, IN Sample Type: Single point or Multi point; Grab or Integrated

Date: 3-28-00 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~~ 2 Run Time 1015-1307	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.4	13.4	13.4	13.4
O_2 - % Vol.	6.0	6.0	6.0	6.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.6	80.6	80.6	80.6

Fo = 1.112

Run Number ~~2~~ 3 Run Time 1345-1646	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.4	13.4	13.4	13.4
O_2 - % Vol.	6.2	6.2	6.2	6.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

Fo = 1.097

Run Number ~~3~~ 4 Run Time 1710-2046	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.4	13.4	13.4	13.4
O_2 - % Vol.	6.2	6.2	6.2	6.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

Fo = 1.097

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METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-95GIB3A Sample Location: Unit 3 Stack

Job Name: EPRI - Cinergy Analytical Method: 3B

Location: Owensville, In Sample Type: Single point ~~or Multi point~~ Grab or ~~Integrated~~

Date: 3-28-00 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

BH

Run Number ~~X~~2 Run Time 1015-1312	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	~~8.8~~ 10.6	~~8.8~~ 10.6	~~8.8~~ 10.6	~~8.8~~ 10.6
O_2 - % Vol.	~~11.0~~ 9.2	~~11.0~~ 9.2	~~11.0~~ 9.2	~~11.0~~ 9.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

F_o = 1.104

Run Number ~~X~~3 Run Time 1345-1642	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	10.8	10.8	10.8	10.8
O_2 - % Vol.	8.8	8.8	8.8	8.8
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

F_o = 1.120

Run Number ~~X~~4 Run Time 1710-2052	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	10.4	10.5	10.5	10.5
O_2 - % Vol.	9.2	9.1	9.1	9.1
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

F_o = 1.124

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APPENDIX C

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-2	0.810	01/31/00
Pitot Tube #M-3	0.808	01/31/00
Pitot Tube #M-4	0.808	01/31/00
Probe Tip #TFE-1-6	0.174	01/31/00
Probe Tip #TFE-1-6a	0.177	03/28/00
Dry Gas Meter #27-2	1.028	03/09/00
Stack Unit Orifice #27-2		03/09/00
Digital Temperature Indicator #27-2		03/09/00
Dry Gas Meter #29-1	0.998	03/10/00
Stack Unit Orifice #29-1		03/16/00
Digital Temperature Indicator #29-1		03/10/00
Barometer #19-1		01/31/00

APPENDIX C

Post Test

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-2	0.807	04/06/00
Pitot Tube #M-3	0.808	04/06/00
Pitot Tube #M-4	0.807	04/06/00
Probe Tip #TFE-1-6	0.174	04/05/00
Probe Tip #TFE-1-6a	0.177	04/05/00
Dry Gas Meter #27-2	1.015	04/07/00
Stack Unit Orifice #27-2		04/07/00
Digital Temperature Indicator #27-2		04/07/00
Dry Gas Meter #29-1	0.994	04/04/00
Stack Unit Orifice #29-1		04/04/00
Digital Temperature Indicator #29-1		04/04/00
Barometer #19-1		04/05/00

PITOT TUBE CALIBRATION

Date: 01-31-00

Time: 1000

Pitot No.: M2

T_s: 65 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808
20	40	0.34	0.34	0.583	0.51	0.714	0.808	0.51	0.714	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.45	1.204	0.822	1.45	1.204	0.822
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 + 1.48%

variation - 0.25%

Normal low side calibration factor 0.810

variation + 1.48%

variation - 0.25%

Calibrator: Sean Green 274

Checked By: Scott Hart #368

PITOT TUBE CALIBRATION

Date: 01-31-00

Time: 1030

Pitot No.: M3

T_s: 65 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	$\sqrt{\text{Standard Average}}$	High	$\sqrt{\text{High}}$	Cal. Factor	Low	$\sqrt{\text{Low}}$	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%

variation - 0%

Normal low side calibration factor 0.808

variation + 0%

variation - 0%

Calibrator: Brian Baton 274

Checked By: Scott Hart 268

PITOT TUBE CALIBRATION

Date: 01-31-00

Time: 1100

Pitot No.: M4

T_s: 65 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808 ✓	0.15	0.387	0.808 ✓
14	30	0.22	0.22	0.469	0.33	0.574	0.808 ✓	0.33	0.574	0.808 ✓
20	40	0.34	0.34	0.583	0.51	0.714	0.808 ✓	0.51	0.714	0.808 ✓
28	50	0.54	0.54	0.735	0.81	0.900	0.808 ✓	0.81	0.900	0.808 ✓
35	60	0.80	0.80	0.894	1.20	1.095	0.808 ✓	1.20	1.095	0.808 ✓
41	70	1.00	1.00	1.000	1.50	1.225	0.808 ✓	1.55	1.245	0.795 ✓
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 ✓			0.806 ✓

Summary of Results:

Normal high side calibration factor 0.808 ✓

variation + 0% ✓

variation - 0% ✓

Normal low side calibration factor 0.806 ✓

variation + 0.25% ✓

variation - 1.36% ✓

Calibrator: Jam Bzom 274

Checked By: Scott Hart 268

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE-1 checked by Scott Hart 2608

Date 01-31-00 Calibrator: Brian Brown 274

	4	6	7	8	10	12
Reading 1	0.116	0.175	0.200	0.235	0.307	0.360
Reading 2	0.114	0.175	0.199	0.236	0.309	0.359
Reading 3	0.118	0.176	0.199	0.235	0.310	0.360
Reading 4	0.118	0.174	0.198	0.235	0.308	0.361
Reading 5	0.117	0.173	0.198	0.234	0.308	0.359
Reading 6	0.118	0.173	0.200	0.234	0.308	0.359
Reading 7	0.116	0.175	0.199	0.234	0.307	0.361
Reading 8	0.116	0.173	0.199	0.236	0.307	0.362
Reading 9	0.116	0.174	0.199	0.236	0.308	0.360
Reading 10	0.117	0.174	0.199	0.235	0.308	0.361
Average	0.117 ✓	0.174 ✓	0.199 ✓	0.235 ✓	0.308 ✓	0.360 ✓

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

NOZZLE CALIBRATION

Nozzle Set No. TFE1

Date 3-28-00 Calibrator: Mike Bass

	6a	8a.				
Reading 1	0.177	0.234				
Reading 2	0.177	0.234				
Reading 3	0.178	0.234				
Reading 4	0.177	0.235				
Reading 5	0.177	0.234				
Reading 6	0.177	0.234				
Reading 7	0.177	0.233				
Reading 8	0.178	0.234				
Reading 9	0.177	0.234				
Reading 10	0.177	0.234				
Average	0.177	0.234				

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: 3-09-00

ΔH ("H_2O)	C_{DG}
0.5	1.031 ✓
1.0	1.032 ✓
1.5	1.031 ✓
2.0	1.028 ✓
3.0	1.022 ✓
4.0	1.021
Average	1.028

Variation: + 0.39 %

- 0.68 %

Calibrator: Mike Bass

Checked By: [signature]

C_{DG} @ 2 liters/min. = 0.963

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 0.5" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 5.5 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1029	5.244 cf	70 °F	-0.85 "H_2O
Start	1016	0.000 cf	70 °F	-0.85 "H_2O
Avg.	13	5.244 cf	70 °F	-0.85 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	853.599 cf	75 °F	73 °F	0.50 "H_2O
Start	848.501 cf	74 °F	72 °F	0.50 "H_2O
Avg.	5.098 cf	74 °F		0.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.244 \left[\frac{29.41 + \frac{-0.850}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 5.115 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.098 \left[\frac{29.41 + \frac{0.500}{13.6}}{74 + 460}\right] = 4.962 \text{ dcsf}$$

$$C_{DG} = \frac{5.115}{4.962} = \boxed{1.031}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 1.0" H_2O

P_b: 29.41 "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	1040	5.362 cf	70 °F	-1.35 "H_2O	859.101 cf	75 °F	73 °F	1.00 "H_2O
Start	1031	0.000 cf	70 °F	-1.35 "H_2O	853.906 cf	75 °F	73 °F	1.00 "H_2O
Avg.	9	5.362 cf	70 °F	-1.35 "H_2O	5.195 cf	74 °F		1.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.362 \left[\frac{29.41 + \frac{-1.350}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 5.223 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.195 \left[\frac{29.41 + \frac{1.000}{13.6}}{74 + 460}\right] = 5.063 \text{ dcsf}$$

$$C_{DG} = \frac{5.223}{5.063} = \boxed{1.032}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 1.5" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 6.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1057	10.625 cf	70 °F	-1.80 "H_2O
Start	1042	0.000 cf	70 °F	-1.80 "H_2O
Avg.	15	10.625 cf	70 °F	-1.80 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	869.702 cf	77 °F	75 °F	1.50 "H_2O
Start	859.402 cf	75 °F	74 °F	1.50 "H_2O
Avg.	10.300 cf	75 °F		1.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.625 \left[\frac{29.41 + \frac{-1.800}{13.6}}{70 + 460} \right] \times 0.998\ (C_f) = 10.339 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.300 \left[\frac{29.41 + \frac{1.500}{13.6}}{75 + 460} \right] = 10.031 \text{ dcsf}$$

$$C_{DG} = \frac{10.339}{10.031} = \boxed{1.031}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27.2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 2.0" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 6.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1013	10.738 cf	70 °F	-2.10 "H_2O
Start	1059	0.000 cf	70 °F	-2.10 "H_2O
Avg.	14	10.738 cf	70 °F	-2.100 "H_2O

Dry Gas Meter

Meter Reading	Temp. In	Temp. Out	P_m
880.444 cf	77 °F	75 °F	2.00 "H_2O
870.007 cf	76 °F	75 °F	2.00 "H_2O
10.437 cf	76 °F		2.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.738 \left[\frac{29.41 + \frac{-2.100}{13.6}}{70 + 460} \right] \times 0.998 \ (C_f) = 10.441 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.437 \left[\frac{29.41 + \frac{2.000}{13.6}}{76 + 460} \right] = 10.158 \text{ dcsf}$$

$$C_{DG} = \frac{10.441}{10.158} = \boxed{1.028}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: Z7-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 3.0" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1134	10.635 cf	70 °F	-2.90 "H_2O
Start	1123	0.000 cf	70 °F	-2.90 "H_2O
Avg.	11	10.635 cf	70 °F	-2.900 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	893.404 cf	79 °F	76 °F	3.00 "H_2O
Start	883.037 cf	77 °F	75 °F	3.00 "H_2O
Avg.	10.367 cf	77 °F		3.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.635 \left[\frac{29.41 + \frac{-2.900}{13.6}}{70 + 460}\right] \times 0.998 \quad (C_f) = 10.320 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.367 \left[\frac{29.41 + \frac{3.000}{13.6}}{77 + 460}\right] = 10.096 \text{ dcsf}$$

$$C_{DG} = \frac{10.320}{10.096} = \boxed{1.022}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 3.75" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 2.5 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1150	10.682 cf	70 °F	-3.50 "H_2O
Start	1140	0.000 cf	70 °F	-3.50 "H_2O
Avg.	10	10.682 cf	70 °F	-3.500 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	904.404 cf	81 °F	77 °F	3.750 "H_2O
Start	893.991 cf	77 °F	76 °F	3.750 "H_2O
Avg.	10.413 cf	78 °F		3.750 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.682 \left[\frac{29.41 + \frac{-3.500}{13.6}}{70 + 460}\right] \times 0.998\,(C_f) = 10.350 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.413 \left[\frac{29.41 + \frac{3.750}{13.6}}{78 + 460}\right] = 10.141 \text{ dcsf}$$

$$C_{DG} = \frac{10.370}{10.141} = \boxed{1.021}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 3-09-00

Calibrator: Mike Bass

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

Run No.: 1 @ 2.0 L/min

P_b: 29.40 "Hg

Control Module Vacuum: < 2 "Hg

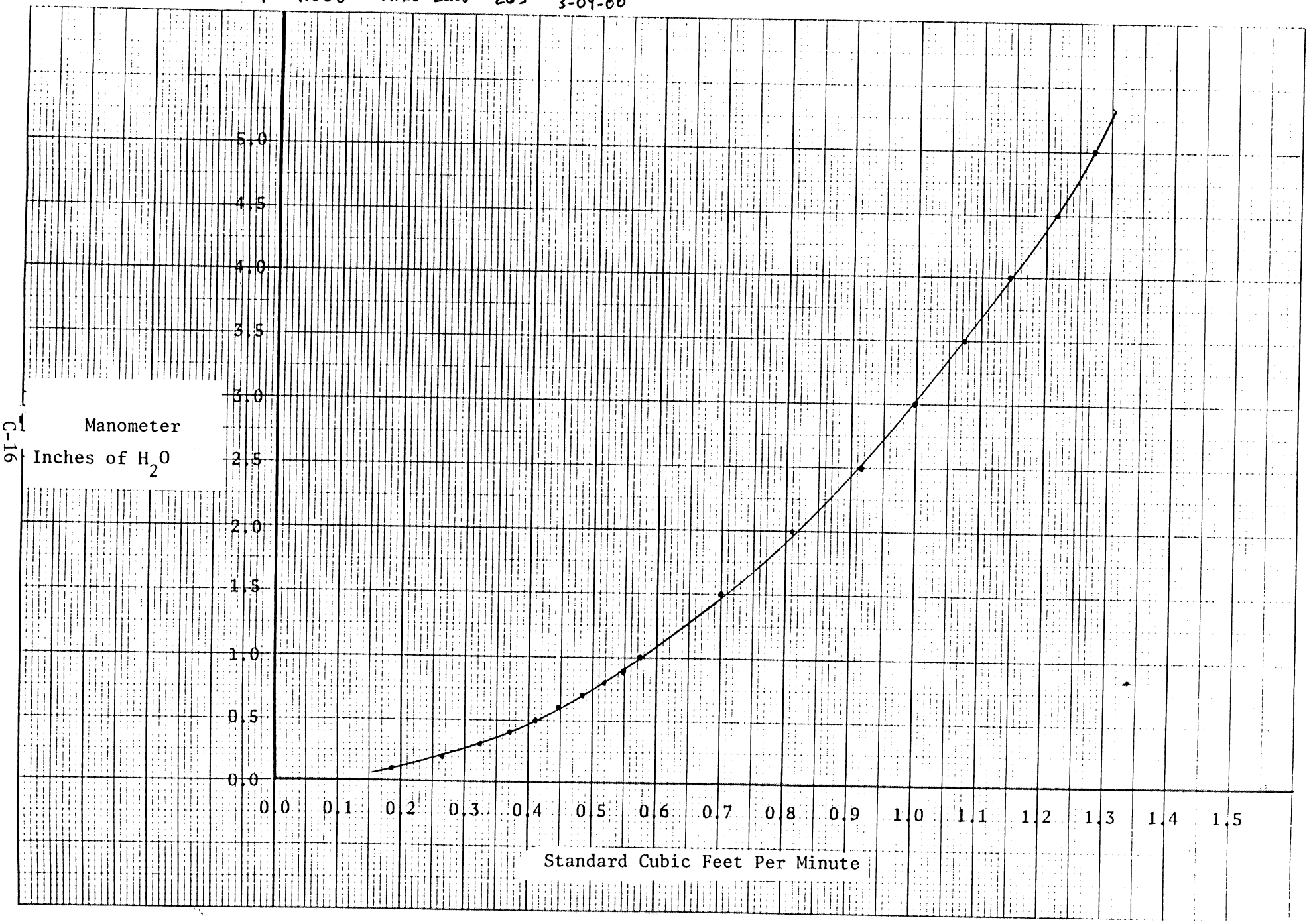
Wet Test Meter (No. 1)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1353	2.102 cf	69 °F	-0.30 "H_2O	909.861 cf	76 °F	76 °F	0.015 "H_2O
Start	1320	0.000 cf	69 °F	-0.30 "H_2O	907.673 cf	76 °F	76 °F	0.015 "H_2O
Avg.	33	2.102 cf	69 °F	-0.30 "H_2O	2.188 cf	76 °F		0.015 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.102 \left[\frac{29.40 + \frac{-0.300}{13.6}}{69 + 460}\right] \times 0.990\ (C_f) = 2.040 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.188 \left[\frac{29.40 + \frac{0.015}{13.6}}{76 + 460}\right] = 2.118 \text{ dcsf}$$

$$C_{DG} = \frac{2.040}{2.118} = \boxed{0.963}$$

CM 27-2 CF: 1.028 Mike Bass #263 3-09-00



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

Date: 3-09-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1003	72	72
Ice Bath	1005	35	36
Boiling Water	1007	212	213
Oven	1018	250	250
Oven	1025	297	297
Oven	1029	351	351
Oven	1031	374	374

Meter Adjusted? Yes _____ No X

Calibrator: Mike Bass

Checked By: [illegible] 236

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 3-10-00

ΔH ("H_2O)	C_{DG}
0.5	1.000 ✓
1.0	1.006 ✓
1.5	1.004 ✓
2.0	1.000 ✓
3.0	0.995 ✓
4.0	0.985 ✓
Average	0.998 ✓

Variation: + 0.80% ✓

- 1.30% ✓

Calibrator: Mike Bass

Checked By: James Moore 236

C_{DG} @ 2 liters/min. = 1.010 ✓

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 3-10-00

Calibrator: Mike Bass

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

Run No.: 1 @ 0.5" H_2O

P_b: 29.33 "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	0930	5.305 cf	69 °F	-0.85 "H_2O	933.377 cf	67 °F	72 °F	0.50 "H_2O
Start	0918	0.000 cf	69 °F	-0.85 "H_2O	928.108 cf	64 °F	68 °F	0.50 "H_2O
Avg.	12	5.305 cf	69 °F	-0.850 "H_2O	5.269 cf	68 °F		0.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.305 \left[\frac{29.33 + \frac{-0.850}{13.6}}{69 + 460}\right] \times 0.998 \quad (C_f) = 5.170 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.269 \left[\frac{29.33 + \frac{0.500}{13.6}}{68 + 460}\right] = 5.172 \text{ dcsf}$$

$$C_{DG} = \frac{5.170}{5.172} = \boxed{1.000}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 3-10-00

Calibrator: Mike Bass

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

Run No.: 1 @ 1.0" H_2O

P_b: 29.33 "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	0942	5.302 cf	69 °F	-1.35 "H_2O	939.313 cf	66 °F	73 °F	1.00 "H_2O
Start	0933	0.000 cf	69 °F	-1.35 "H_2O	934.076 cf	68 °F	73 °F	1.00 "H_2O
Avg.	9	5.302 cf	69 °F	-1.350 "H_2O	5.237 cf	70 °F		1.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.302 \left[\frac{29.33 + \frac{-1.350}{13.6}}{69 + 460}\right] \times 0.998\ (C_f) = 5.161 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.237 \left[\frac{29.33 + \frac{1.000}{13.6}}{70 + 460}\right] = 5.128 \text{ dcsf}$$

$$C_{DG} = \frac{5.161}{5.128} = \boxed{1.006}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 3-10-00

Calibrator: Mike Bass

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

Run No.: 1 @ 1.5" H_2O

P_b: 29.33 "Hg

Control Module Vacuum: 5.5 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	0958	10.301 cf	69 °F	-1.80 "H_2O
Start	0944	0.000 cf	69 °F	-1.80 "H_2O
Avg.	14	10.301 cf	69 °F	-1.800 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	949.792 cf	63 °F	74 °F	1.50 "H_2O
Start	939.619 cf	67 °F	74 °F	1.50 "H_2O
Avg.	10.173 cf	70 °F		1.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.301 \left[\frac{29.33 + \frac{-1.800}{13.6}}{69 + 460}\right] \times 0.998\ (C_f) = 10.015 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.173 \left[\frac{29.33 + \frac{1.500}{13.6}}{70 + 460}\right] = 9.974 \text{ dcsf}$$

$$C_{DG} = \frac{10.015}{9.974} = \boxed{1.004}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 3-10-00

Calibrator: Mike Bass

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

Run No.: 1 @ 2.0 " H_2O

P_b: 29.33 "Hg

Control Module Vacuum: ~~6.0~~ 5.5 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1012	10.427 cf	69 °F	-2.30 "H_2O
Start	0959	0.000 cf	69 °F	-2.30 "H_2O
Avg.	13	10.427 cf	69 °F	-2.300 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	960.503 cf	62 °F	74 °F	2.00 "H_2O
Start	950.213 cf	65 °F	74 °F	2.00 "H_2O
Avg.	10.290 cf	69 °F		2.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.427 \left[\frac{29.33 + \frac{-2.300}{13.6}}{69 + 460}\right] \times 0.998\ (C_f) = 10.125 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.290 \left[\frac{29.33 + \frac{2.000}{13.6}}{69 + 460}\right] = 10.120 \text{ dcsf}$$

$$C_{DG} = \frac{10.125}{10.120} = \boxed{1.000}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 3-10-00

Calibrator: Mike Bass

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

Run No.: 1 @ 3.0" H_2O

P_b: 29.33 "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	1024	10.503 cf	69 °F	-3.20 "H_2O	971.172 cf	59 °F	73 °F	3.00 "H_2O
Start	1013	0.000 cf	69 °F	-3.20 "H_2O	960.821 cf	64 °F	74 °F	3.00 "H_2O
Avg.	11	10.503 cf	69 °F	-3.200 "H_2O	10.351 cf	68 °F		3.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.503 \left[\frac{29.33 + \frac{-3.200}{13.6}}{69 + 460}\right] \times 0.998\,(C_f) = 10.175 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.351 \left[\frac{29.33 + \frac{3.000}{13.6}}{68 + 460}\right] = 10.225 \text{ dcsf}$$

$$C_{DG} = \frac{10.175}{10.225} = \boxed{0.995}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Mike Bass

Date: 3-10-00

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

Run No.: 1 @ 4.0" H_2O

P_b: 29.33 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1034	10.511 cf	69 °F	-4.15 "H_2O
Start	1025	0.000 cf	69 °F	-4.15 "H_2O
Avg.	9	10.511 cf	69 °F	-4.150 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	982.264 cf	59 °F	73 °F	4.00 "H_2O
Start	971.867 cf	62 °F	73 °F	4.00 "H_2O
Avg.	10.397 cf	67 °F		4.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.511 \left[\frac{29.33 + \frac{-4.150}{13.6}}{69 + 460}\right] \times 0.998\ (C_f) = 10.159 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.397 \left[\frac{29.33 + \frac{4.000}{13.6}}{67 + 460}\right] = 10.315 \text{ dcsf}$$

$$C_{DG} = \frac{10.159}{10.315} = \boxed{0.985}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Mike Basc

Date: 3-10-00

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

Run No.: 1 @ 2.0 L/min

P_b: 29.35 "Hg

Control Module Vacuum: < 2.0 "Hg

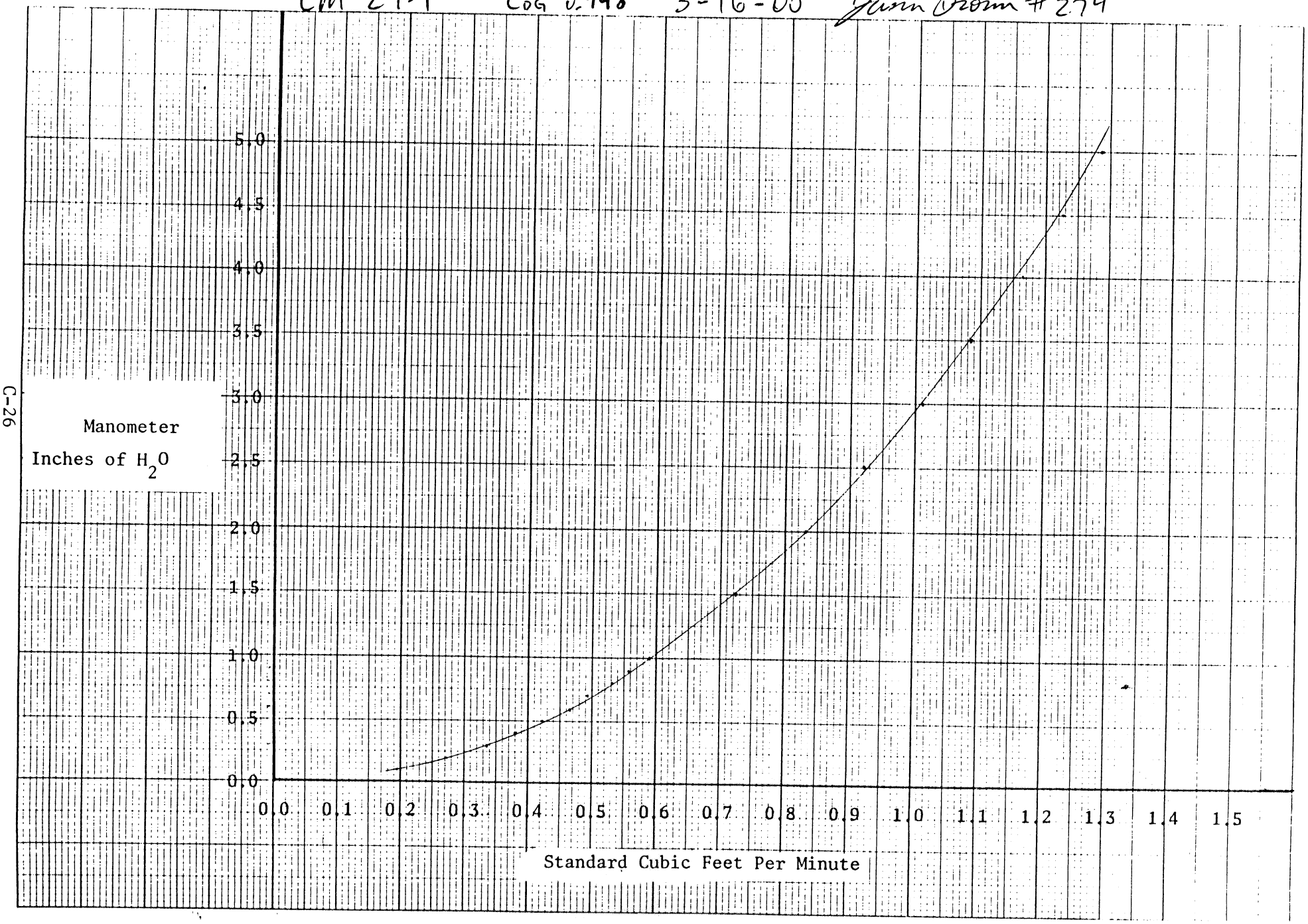
Wet Test Meter (No. 1)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1152	2.141 cf	68 °F	-0.250 "H_2O	8.127 cf	75 °F	75 °F	0.010 "H_2O
Start	1119	0.000 cf	68 °F	-0.250 "H_2O	6.013 cf	68 °F	71 °F	0.010 "H_2O
Avg.	33	2.141 cf	68 °F	-0.250 "H_2O	2.114 cf	72 °F		0.010 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.141 \left[\frac{29.35 + \frac{-0.250}{13.6}}{68 + 460}\right] \times 0.990\ (C_f) = 2.078 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.114 \left[\frac{29.35 + \frac{0.010}{13.6}}{72 + 460}\right] = 2.059 \text{ dcsf}$$

$$C_{DG} = \frac{2.078}{2.059} = \boxed{1.010}$$

checked by M Bass 263 CM 29-1 Cog 0.998 3-16-00 Jann Broom #274



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 3-10-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	0903	68	68
Ice Bath	0905	32	32
Boiling Water	0915	212	211
Oven	0919	255	255
Oven	0921	300	301
Oven	0924	350	349
Oven	0927	376	374

Meter Adjusted? Yes _____ No X

Calibrator: Mike Bass

Checked By: [illegible] 236

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 01-31-00

Time: 1600

Barometric Pressure @ Addison Airport @ 719 ft.	=	30.17
	-	0.719
Absolute Pressure @ Addison Airport	=	29.451 ✓
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.534 ✓
Barometer Reading	=	29.61
Variation	=	~~0.269~~ -0.08 ✓

Barometer Adjusted? Yes ✓ No _____

Tom Brown 274

Signature of Calibrator

PITOT TUBE CALIBRATION

Date: 4-6-00

Time: 1030

Pitot No.: M2

T_s: 70 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808 ✓
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808 ✓
20	40	0.34	0.34	0.583	0.50	0.707	0.816	0.50	0.707	0.816 ✓
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808 ✓
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808 ✓
41	70	1.00	1.00	1.000	1.55	1.245	0.795	1.55	1.245	0.795 ✓
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 + 1.12% ✓

variation - 1.49% ✓

Normal low side calibration factor 0.807 ✓

variation + 1.12% ✓

variation - 1.49% ✓

Calibrator: Jann Brown #274

Checked By: Jann Urschler #275

PITOT TUBE CALIBRATION

Date: 04-06-00

Time: 0930

Pitot No.: M3

T_s: 70 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

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

Summary of Results:

Normal high side calibration factor 0.808 ✓

variation + 0.0% ✓

variation - 0.0% ✓

Normal low side calibration factor 0.808 ✓

variation + 0.0% ✓

variation - 0.0% ✓

Calibrator: Jam Brown #274

Checked By: Jason Chunter #275

PITOT TUBE CALIBRATION

Date: 4-6-00

Pitot No.: M4

Pitot Dimensions: 3/8" tip

Time: 1100

T_s: 70 °F

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	2.45	1.565	0.800	2.45	1.565	0.800 ✓
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 - 0.87% ✓

Normal low side calibration factor 0.807 ✓

variation + 0.12% ✓

variation - 0.87% ✓

Calibrator: Jason Brown #274

Checked By: Jason Chunha #275

METCO ENVIRONMENTAL

NOZZLE CALIBRATION

Nozzle Set No. TFE1

Date 04-05-00 Calibrator: JASON BROWN #274 JB

	4	6	*6a	*8a	10	12
Reading 1	0.118	0.172	0.179	0.234	0.310	0.359
Reading 2	0.118	0.173	0.177	0.235	0.308	0.360
Reading 3	0.116	0.175	0.175	0.234	0.308	0.361
Reading 4	0.117	0.175	0.175	0.234	0.308	0.360
Reading 5	0.119	0.173	0.177	0.233	0.309	0.362
Reading 6	0.117	0.172	0.177	0.233	0.307	0.361
Reading 7	0.116	0.174	0.177	0.234	0.308	0.359
Reading 8	0.118	0.175	0.178	0.234	0.307	0.361
Reading 9	0.117	0.174	0.177	0.234	0.307	0.359
Reading 10	0.116	0.174	0.177	0.234	0.308	0.361
Average	0.117	0.174	0.177	0.234	0.308	0.360

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

* New Nozzles

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 4-7-00

ΔH ("H_2O)	C_{DG}
0.5	0.997 ✓
1.0	1.007 ✓
1.5	1.016 ✓
2.0	1.024 ✓
3.0	1.027 ✓
4.0	1.017 ✓
Average	1.015 ✓

Variation: + 1.18%

- 1.77%

Calibrator: John Betz

Checked By: Jaime Brown #274

C_{DG} @ 2 liters/min. = 1.065 ✓

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 0.50 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	0932	5.203 cf	73 °F	-0.70 "H_2O
Start	0920	0.000 cf	73 °F	-0.70 "H_2O
Avg.	12	5.203 cf	73 °F	-0.70 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	262.777 cf	78 °F	77 °F	0.50 "H_2O
Start	257.544 cf	76 °F	76 °F	0.50 "H_2O
Avg.	5.233 cf	77 °F		0.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.203 \left[\frac{28.95 + \frac{-0.70}{13.6}}{73 + 460}\right] \times 0.998\ (C_f) = 4.969 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.233 \left[\frac{28.95 + \frac{0.50}{13.6}}{77 + 460}\right] = 4.986 \text{ dcsf}$$

$$C_{DG} = \frac{4.969}{4.986} = \boxed{0.997}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 1.00 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	0947	5.213 cf	73 °F	-1.10 "H_2O
Start	0938	0.000 cf	73 °F	-1.10 "H_2O
Avg.	9	5.213 cf	73 °F	-1.10 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	268.481 cf	78 °F	77 °F	1.00 "H_2O
Start	263.292 cf	78 °F	77 °F	1.00 "H_2O
Avg.	5.189 cf	78 °F	78 °F	1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.213 \left[\frac{28.95 + \frac{-1.10}{13.6}}{73 + 460}\right] \times 0.998 \quad (C_f) = 4.974 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.189 \left[\frac{28.95 + \frac{1.00}{13.6}}{78 + 460}\right] = 4.941 \text{ dcsf}$$

$$C_{DG} = \frac{4.974}{4.941} = \boxed{1.007}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 1.50 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1007	10.682 cf	73 °F	-1.60 "H_2O
Start	0952	0.000 cf	73 °F	-1.60 "H_2O
Avg.	15	10.682 cf	73 °F	-1.60 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	279.951 cf	79 °F	78 °F	1.50 "H_2O
Start	269.445 cf	78 °F	77 °F	1.50 "H_2O
Avg.	10.506 cf	78 °F		1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.682 \left[\frac{28.95 + \frac{-1.60}{13.6}}{73 + 460}\right] \times 0.998 \quad (C_f) = 10.178 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.506 \left[\frac{28.95 + \frac{1.50}{13.6}}{78 + 460}\right] = 10.016 \text{ dcsf}$$

$$C_{DG} = \frac{10.178}{10.016} = \boxed{1.016}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 2.00 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1033	10.582 cf	73 °F	-2.10 "H_2O
Start	1020	0.000 cf	73 °F	-2.10 "H_2O
Avg.	13	10.582 cf	73 °F	-2.10 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	292.067 cf	80 °F	79 °F	2.00 "H_2O
Start	281.746 cf	79 °F	78 °F	2.00 "H_2O
Avg.	10.321 cf	79 °F		2.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.582 \left[\frac{28.95 + \frac{-2.10}{13.6}}{73 + 460}\right] \times 0.998 \quad (C_f) = 10.070 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.321 \left[\frac{28.95 + \frac{2.00}{13.6}}{79 + 460}\right] = 9.834 \text{ dcsf}$$

$$C_{DG} = \frac{10.070}{9.834} = \boxed{1.024}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 3.00 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1048	10.869 cf	73 °F	-2.90 "H_2O
Start	1037	0.000 cf	73 °F	-2.90 "H_2O
Avg.	11	10.869 cf	73 °F	-2.90 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	303.464 cf	81 °F	79 °F	3.00 "H_2O
Start	292.931 cf	80 °F	79 °F	3.00 "H_2O
Avg.	10.543 cf	80 °F		3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.869 \left[\frac{28.95 + \frac{-2.90}{13.6}}{73 + 460}\right] \times 0.998 \quad (C_f) = 10.322 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.543 \left[\frac{28.95 + \frac{3.00}{13.6}}{80 + 460}\right] = 10.052 \text{ dcsf}$$

$$C_{DG} = \frac{10.322}{10.052} = \boxed{1.027}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 4.00 "H2O

P_b: 28.95 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1110	10.788 cf	73 °F	-4.00 "H_2O
Start	1100	0.000 cf	73 °F	-4.00 "H_2O
Avg.	10	10.788 cf	73 °F	-4.00 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	323.370 cf	82 °F	80 °F	4.00 "H_2O
Start	312.861 cf	80 °F	79 °F	4.00 "H_2O
Avg.	10.509 cf	80 °F		4.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.788 \left[\frac{28.95 + \frac{-4.00}{13.6}}{73 + 460}\right] \times 0.998 \quad (C_f) = 10.217 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.509 \left[\frac{28.95 + \frac{4.00}{13.6}}{80 + 460}\right] = 10.045 \text{ dcsf}$$

$$C_{DG} = \frac{10.217}{10.045} = \boxed{1.017}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 4-7-00

Calibrator: John Betz

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

Run No.: 1 @ 2L

P_b: 28.95 "Hg

Control Module Vacuum: 2.0 "Hg

Wet Test Meter (No. 1)

	Time	Meter Reading	Temp.	P_m
End	1305	5.103 cf	73 °F	-0.50 "H_2O
Start	1200	0.000 cf	73 °F	-0.50 "H_2O
Avg.	105	5.103 cf	73 °F	-0.50 "H_2O

Dry Gas Meter

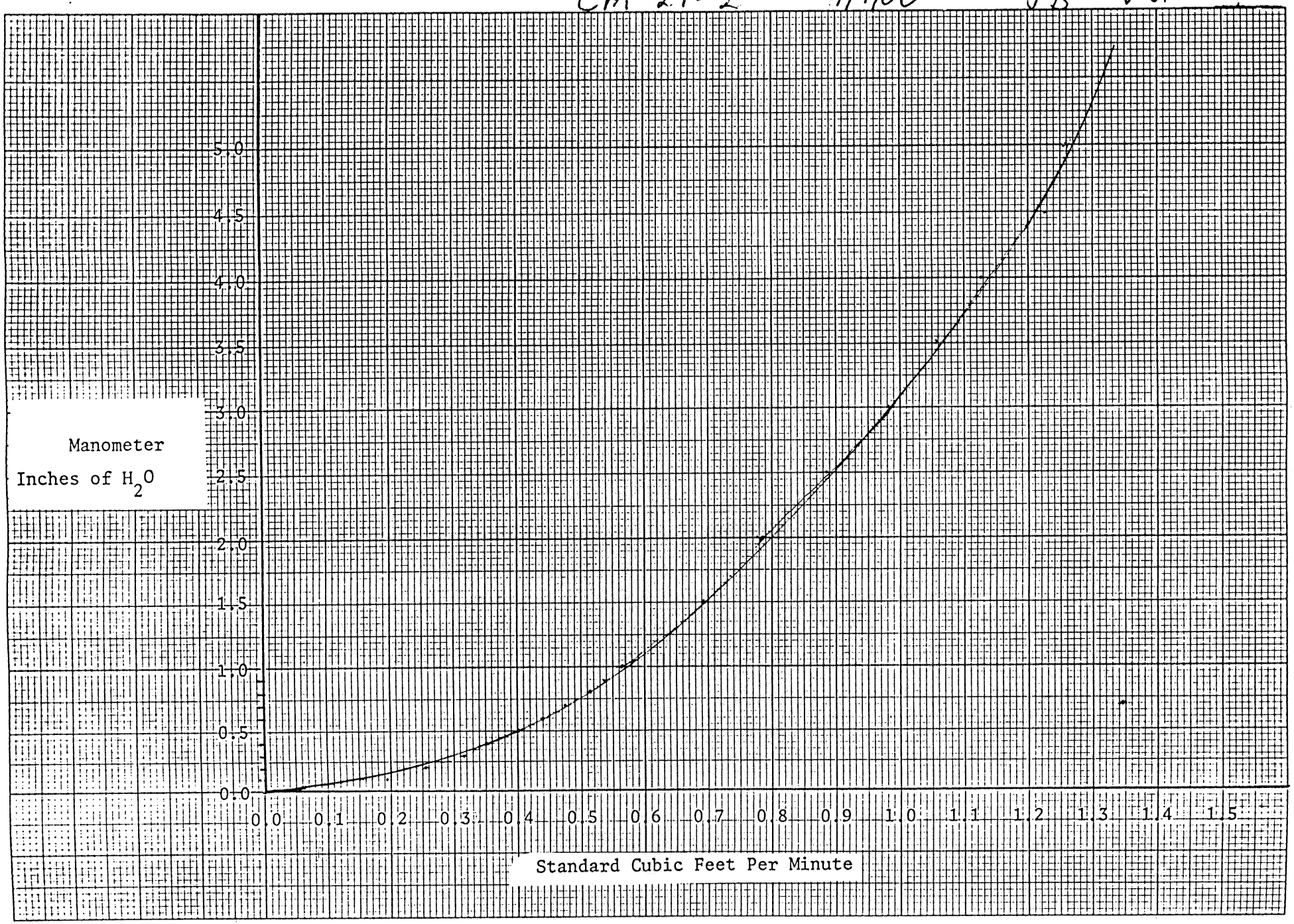
	Meter Reading	Temp. In	Temp. Out	P_m
End	329.100 cf	80 °F	79 °F	0.010 "H_2O
Start	324.310 cf	78 °F	77 °F	0.010 "H_2O
Avg.	4.790 cf	79 °F		0.01 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.103 \left[\frac{28.95 + \frac{-0.50}{13.6}}{73 + 460}\right] \times 0.990 \quad (C_f) = 4.837 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 4.790 \left[\frac{28.95 + \frac{0.01}{13.6}}{79 + 460}\right] = 4.541 \text{ dcsf}$$

$$C_{DG} = \frac{4.837}{4.541} = \boxed{1.065}$$

CM 27-2 4/7/00 JB ✓JM



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

Date: 4-7-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	0915	74	75
Ice Bath	0918	35	36
Boiling Water	0922	212	213
Oven	0930	250	252
Oven	0935	300	303
Oven	0940	350	354
Oven	0945	375	378

Meter Adjusted? Yes _____ No ✓

Calibrator: John Betz

Checked By: John Brown #274

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 04-04-00

ΔH ("H_2O)	C_{DG}
0.5	0.995
1.0	01.005
1.5	1.001
2.0	0.998
3.0	0.984
4.0	0.981
Average	0.994

Variation: + 1.11%

- 1.31%

Calibrator: Jim Brown #274

Checked By: [illegible] #215

C_{DG} @ 2 liters/min. = 1.001

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: Jim Brown

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

Run No.: 1 @ 0.50" H_2O

P_b: 29.35 "Hg

Control Module Vacuum: 5.50 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1024	5.158 cf	67 °F	-0.90 "H_2O	385.844 cf	64 °F	71 °F	0.50 "H_2O
Start	1012	0.0 cf	67 °F	-0.90 "H_2O	380.686 cf	64 °F	68 °F	0.50 "H_2O
Avg.	12	5.158 cf	67 °F	-0.90 "H_2O	5.158 cf	67 °F		0.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.158 \left[\frac{29.35 + \frac{-0.90}{13.6}}{67 + 460}\right] \times 0.998 (C_f) = 5.049 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.158 \left[\frac{29.35 + \frac{0.50}{13.6}}{67 + 460}\right] = 5.077 \text{ dcsf}$$

$$C_{DG} = \frac{5.049}{5.077} = \boxed{0.995}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: Jim Brown

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

Run No.: 1 @ 1.00 "H_2O

P_b: 29.35 "Hg

Control Module Vacuum: 5.50 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1037	5.412 cf	67 °F	-1.40 "H_2O	391.761 cf	62 °F	74 °F	1.00 "H_2O
Start	1028	0.0 cf	67 °F	-1.40 "H_2O	386.400 cf	68 °F	73 °F	1.00 "H_2O
Avg.	9	5.412 cf	67 °F	-1.40 "H_2O	5.361 cf	69 °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.412 \left[\frac{29.35 + \frac{-1.40}{13.6}}{67 + 460}\right] \times 0.998\,(C_1) = 5.291 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.361 \left[\frac{29.35 + \frac{1.00}{13.6}}{69 + 460}\right] = 5.263 \text{ dcsf}$$

$$C_{DG} = \frac{5.291}{5.263} = \boxed{1.005}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: Jim Brown

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

Run No.: 1 @ 1.50" H_2O

P_b: 29.35 "Hg

Control Module Vacuum: 5.00 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1056	10.170 cf	67 °F	-1.70 "H_2O	403.452 cf	57 °F	75 °F	1.50 "H_2O
Start	1042	0.0 cf	67 °F	-1.70 "H_2O	393.376 cf	65 °F	75 °F	1.50 "H_2O
Avg.	14	10.170 cf	67 °F	-1.70 "H_2O	10.076 cf	68 °F		1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.170 \left[\frac{29.35 + \frac{-1.70}{13.6}}{67 + 460}\right] \times 0.998 (C_f) = 9.934 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.076 \left[\frac{29.35 + \frac{1.50}{13.6}}{68 + 460}\right] = 9.923 \text{ dcsf}$$

$$C_{DG} = \frac{9.934}{9.923} = \boxed{1.001}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

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: 29.35 "Hg

Control Module Vacuum: 5.50 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	11 11	10.013 cf	67 °F	-2.30 "H_2O	413.775 cf	55 °F	76 °F	2.00 "H_2O
Start	1059	0.0 cf	67 °F	-2.30 "H_2O	403.855 cf	64 °F	76 °F	2.00 "H_2O
Avg.	12	10.013 cf	67 °F	-2.30 "H_2O	9.920 cf	68 °F		2.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.013 \left[\frac{29.35 + \frac{-2.30}{13.6}}{67 + 460}\right] \times 0.998\ (C_f) = 9.766 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.920 \left[\frac{29.35 + \frac{2.00}{13.6}}{68 + 460}\right] = 9.781 \text{ dcsf}$$

$$C_{DG} = \frac{9.766}{9.781} = \boxed{0.998}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: Jason Brown

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

Run No.: 1 @ 3.00" H_2O

P_b: 29.35 "Hg

Control Module Vacuum: 5.50 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1124	10.185 cf	67 °F	-3.20 "H_2O	424.553 cf	52 °F	76 °F	3.00 "H_2O
Start	1114	0.0 cf	67 °F	-3.20 "H_2O	414.399 cf	60 °F	76 °F	3.00 "H_2O
Avg.	10	10.185 cf	67 °F	-3.20 "H_2O	10.154 cf	66 °F		3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.185 \left[\frac{29.35 + \frac{-3.20}{13.6}}{67 + 460}\right] \times 0.998\,(C_f) = 9.911 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.154 \left[\frac{29.35 + \frac{3.00}{13.6}}{66 + 460}\right] = 10.075 \text{ dcsf}$$

$$C_{DG} = \frac{9.911}{10.075} = \boxed{0.984}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: [signature]

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

Run No.: 1 @ 4.00 "H_2O

P_b: 29.35 "Hg

Control Module Vacuum: 5.50 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1136	10.542 cf	67 °F	-4.00 "H_2O	435.526 cf	54 °F	79 °F	4.00 "H_2O
Start	1127	0.0 cf	67 °F	-4.10 "H_2O	425.019 cf	59 °F	75 °F	4.00 "H_2O
Avg.	9	10.542 cf	67 °F	-4.05 "H_2O	10.507 cf	67 °F		4.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.542 \left[\frac{29.35 + \frac{-4.05}{13.6}}{67 + 460}\right] \times 0.998 (C_f) = 10.237 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.507 \left[\frac{29.35 + \frac{4.00}{13.6}}{67 + 460}\right] = 10.432 \text{ dcsf}$$

$$C_{DG} = \frac{10.237}{10.432} = \boxed{0.981}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 4-4-00

Calibrator: Jim Brown

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

Run No.: 1 @ 2.0 L/min

P_b: ~~29.35~~ 29.27 "Hg

Control Module Vacuum: 5.50 "Hg

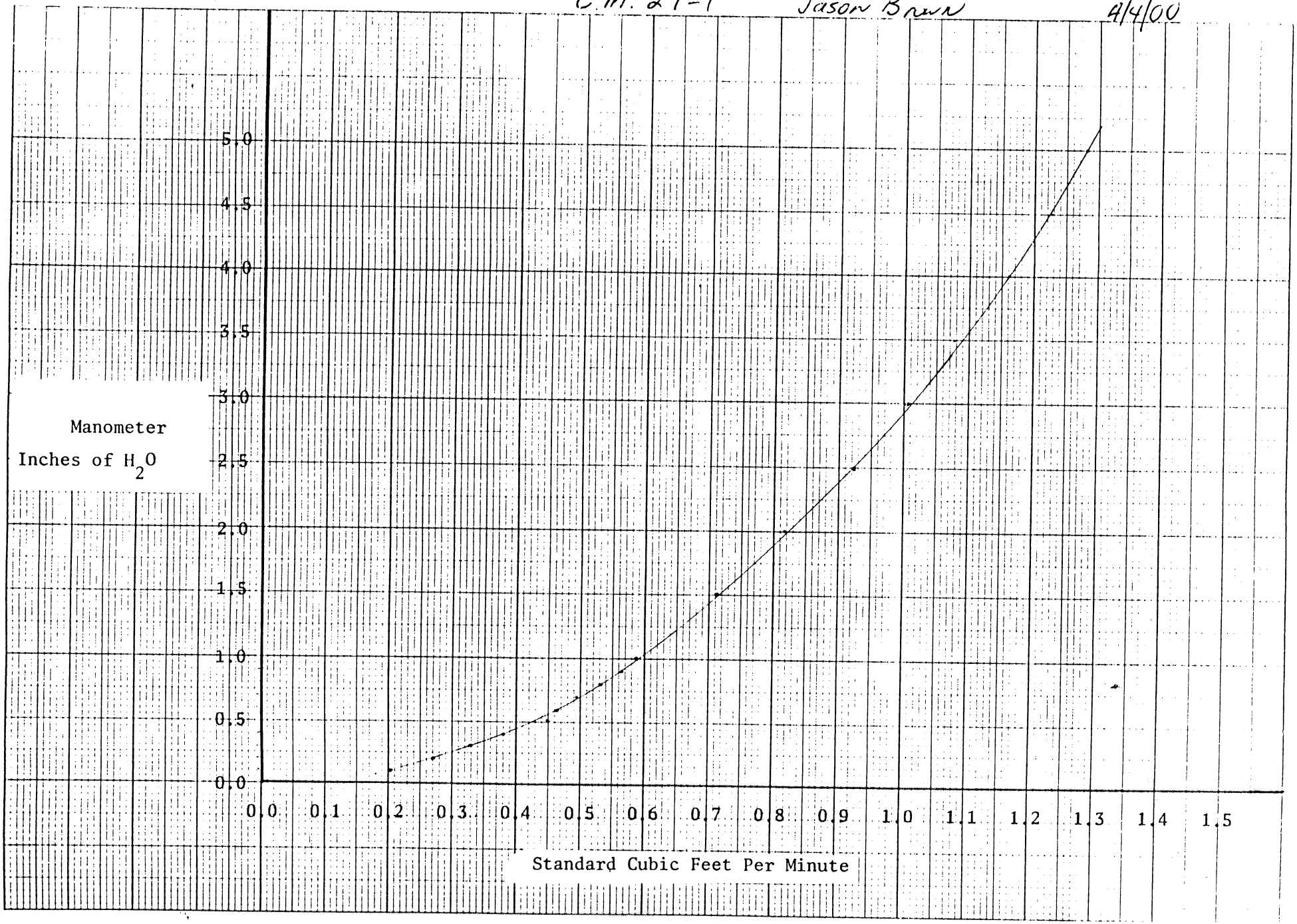
Wet Test Meter (No. 1)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1402	1.997 cf	66 °F	-0.5 "H_2O	438.214 cf	69 °F	70 °F	0.01 "H_2O
Start	1332	0.0 cf	66 °F	-0.5 "H_2O	436.238 cf	65 °F	65 °F	0.01 "H_2O
Avg.	30	1.997 cf	66 °F	-0.5 "H_2O	1.976 cf	67 °F		0.01 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 1.997 \left[\frac{29.27 + \frac{-0.5}{13.6}}{66 + 460}\right] \times 0.990\ (C_f) = 1.939 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 1.976 \left[\frac{29.27 + \frac{0.01}{13.6}}{67 + 460}\right] = 1.937 \text{ dcsf}$$

$$C_{DG} = \frac{1.939}{1.937} = \boxed{1.001}$$

C.M. 29-1 Jason Brown 4/4/00



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 4-4-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	0920	62	61
Ice Bath	0922	32	31
Boiling Water	0929	212	212
Oven	0946	250	252
Oven	0956	299	300
Oven	1003	350	351
Oven	1010	376	376

Meter Adjusted? Yes _____ No ✓

Calibrator: Sam Brown #274

Checked By: John Chisholm #375

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 04-05-00

Time: 1620

Barometric Pressure @ Addison Airport @ 719 ft.	=	29.92
	-	0.719
Absolute Pressure @ Addison Airport	=	29.201
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.28
Barometer Reading	=	29.28
Variation	=	0.0

Barometer Adjusted? Yes _____ No ✓

Jam Brown #274

Signature of Calibrator

✓ J.P.

APPENDIX D

Analytical Data

TestAmerica
INCORPORATED

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

March 28, 2000

Dear Doug,

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

Case Narrative

TestAmerica received the samples for analysis by the Ontario Hydro Method on April 7, 2000. The coal samples were received April 21, 2000. No Chain of Custody was provided with the coal samples. All samples were intact when received. Please note the following:

- The Container #8 Reagent Blank had a Hg detection (4.47 ug). All Container #3 samples were blank corrected based upon the initial container volume.
- The Container #10 Reagent Blank had a Hg detection (0.071 ug). All Container #5 samples were blank corrected based upon the initial container volume.
- The filter IDs on the chain of custody did not match the ID on the samples provided for the Precipitator Inlet Run #2. The chain identifies the filters as Q129 and 47Q190. The samples provided for analysis were Q126 and 47Q193.
- No # ID was assigned to the filter from Stack Run #4. The filter is identified only as "Filter".
- There was one sample that was received that was labeled as Container #5 Stack but did not list the Run #. It is assumed that it is for Run #4 as all other Container #5 samples are accounted for.
- All Duplicate and Triplicate sample results had a Relative Percent Difference of <10 %.
- 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

James A. Davis
QA Coordinator

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

TestAmerica
INCORPORATED

Sample ID: EPRI-Cinergy
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Summary Report

	Unit 3 Stack Run 2	Unit 3 Stack Run 3	Unit 3 Stack Run 4	Unit 3 Precipitator Inlet Run 2	Unit 3 Precipitator Inlet Run 3	Unit 3 Precipitator Inlet Run 4
Particle Bound Hg (ug)	0.006	0.008	0.011	2.86	1.95	2.76
Oxidized Hg (ug)	38.3	38.9	49.9	46.8	59.2	69.8
Elemental Hg (ug)	8.98	7.01	4.86	6.48	4.55	2.59
Total Hg (ug)	47.3	45.9	54.8	56.1	65.7	75.2

	Unit 3 Stack Blank Train	Unit 3 Precipitator Inlet Blank Train
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	4.52	0.000
Elemental Hg (ug)	0.182	0.000
Total Hg (ug)	4.70	0.000

	Reagent Blanks
Container # 7 (ug/L)	<0.050
Container # 8 (ug/L)	6.23
Container # 9 (ug/L)	<0.128
Container # 10 (ug/L)	0.071
Container # 11 (ug/L)	<0.050
Container # 12 (47 mm) (ug)	<0.0025

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

TestAmerica
INCORPORATED

Sample ID: EPRI-Cinergy
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Duplicate Summary Report

	Unit 3 Stack Run 2	Unit 3 Stack Run 3	Unit 3 Stack Run 4	Unit 3 Precipitator Inlet Run 2	Unit 3 Precipitator Inlet Run 3	Unit 3 Precipitator Inlet Run 4
Particle Bound Hg (ug)	0.006	0.008	0.011	2.86	1.95	2.75
Oxidized Hg (ug)	39.0	38.7	51.3	47.3	60.6	68.9
Elemental Hg (ug)	8.88	7.02	4.83	6.55	4.55	2.59
Total Hg (ug)	47.9	45.7	56.1	56.7	67.1	74.2

	Unit 3 Stack Blank Train	Unit 3 Precipitator Inlet Blank Train
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	4.52	0.000
Elemental Hg (ug)	0.180	0.000
Total Hg (ug)	4.70	0.000

	Reagent Blanks
Container # 7 (ug/L)	<0.050
Container # 8 (ug/L)	6.33
Container # 9 (ug/L)	<0.128
Container # 10 (ug/L)	0.069
Container # 11 (ug/L)	<0.050
Container # 12 (47 mm) (ug)	<0.0025

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

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Spike Summary Report

TestAmerica ID	Sample ID	Sample Result	Spike Result	Spike Amount	% Recovery
I2-3	Unit 3 Precipitator Inlet Run 2, Cont. #3	46.8 ug	93.8 ug	44.2 ug	106
IRB-8	Reagent Blank, Cont. #8	6.23	20.3 ug/L	14 ug/L	100
I2-5	Unit 3 Precipitator Inlet Run 2, Cont. #5	6.19 ug	8.99 ug	2.35 ug	119
I2-4	Unit 3 Precipitator Inlet Run 2, Cont. #4	0.287 ug	0.869 ug	0.564 ug	103
47Q194	Unit 3 Precipitator Inlet Run 3, Cont. #1	0.0039 ug	0.0555 ug	0.0500 ug	103
47Q195	Reagent Blank, Cont. #12	<0.0025	0.053 ug	0.050 ug	106

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

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Unit 3 Precipitator Inlet Run 2

Collected On: 3/29/00
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	Q126	04/20/00	04/20/00	epk	2.83	2.83	<1.0	---	---	ug		*2
Container # 1B	47Q193	04/20/00	04/20/00	epk	0.0062	0.0060	4.1	0.0065	4.7	ug		*3
Container # 2	I2-2	04/17/00	04/18/00	sah	0.025	0.026	1.3	0.024	5.0	ug		
Container # 3	I2-3	04/17/00	04/18/00	sah	46.8	47.3	<1.0	---	---	ug		*1
Container # 4	I2-4	04/18/00	04/19/00	sah	0.287	0.284	1.1	---	---	ug		
Container # 5	I2-5	04/17/00	04/18/00	sah	6.19	6.27	1.1	---	---	ug		*1

Particle Bound Hg (ug) **2.86**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **46.80**
(Containers 3)

Elemental Hg (ug) **6.48**
(Containers 4 and 5)

Total Hg (ug) **56.14**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **2.86**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **47.30**
(Containers 3)

Dup. Elemental Hg (ug) **6.55**
(Containers 4 and 5)

Dup. Total Hg (ug) **56.72**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:
*1 Reagent Blank Corrected
*2 Chain Identified the filter as Q129
*3 Chain Identified the filter as 47Q190

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Unit 3 Precipitator Inlet Run 3

Collected On: 3/29/00
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	Q127	04/20/00	04/20/00	epk	1.95	1.95	<1.0	---	---	ug		
Container # 1B	47Q194	04/20/00	04/20/00	epk	0.0039	0.0042	8.7	---	---	ug		
Container # 2	I3-2	04/17/00	04/18/00	sah	<0.0055	<0.0055	<1.0	---	---	ug		
Container # 3	I3-3	04/17/00	04/18/00	sah	59.2	60.6	2.0	57.5	2.8	ug		*1
Container # 4	I3-4	04/18/00	04/19/00	sah	0.190	0.194	2.0	0.179	6.4	ug		
Container # 5	I3-5	04/17/00	04/18/00	sah	4.36	4.36	<1.0	4.26	2.3	ug		*1

Particle Bound Hg (ug) **1.95**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **59.20**
(Containers 3)

Elemental Hg (ug) **4.55**
(Containers 4 and 5)

Total Hg (ug) **65.70**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **1.95**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **60.60**
(Containers 3)

Dup. Elemental Hg (ug) **4.55**
(Containers 4 and 5)

Dup. Total Hg (ug) **67.11**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 Reagent Blank Corrected

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Unit 3 Precipitator Inlet Run 4

Collected On: 3/29/00
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	Q128	04/20/00	04/20/00	epk	2.74	2.73	<1.0	---	---	ug		
Container # 1B	47Q198	04/20/00	04/20/00	epk	0.0042	0.0045	5.8	---	---	ug		
Container # 2	I4-2	04/17/00	04/18/00	sah	0.019	0.020	4.8	---	---	ug		
Container # 3	I4-3	04/17/00	04/18/00	sah	69.8	68.9	1.1	---	---	ug		*1
Container # 4	I4-4	04/18/00	04/19/00	sah	0.102	0.095	7.1	---	---	ug		
Container # 5	I4-5	04/17/00	04/18/00	sah	2.49	2.49	<1.0	---	---	ug		*1

Particle Bound Hg (ug) **2.76**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **69.80**
(Containers 3)

Elemental Hg (ug) **2.59**
(Containers 4 and 5)

Total Hg (ug) **75.16**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **2.75**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **68.90**
(Containers 3)

Dup. Elemental Hg (ug) **2.59**
(Containers 4 and 5)

Dup. Total Hg (ug) **74.24**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 Reagent Blank Corrected

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Unit 3 Precipitator Inlet Blank Train

Collected On: 3/29/00
Collected By: METCO

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

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided			---	---	---	---	---	ug		
Container # 1B		Not Provided			---	---	---	---	---	ug		
Container # 2		Not Provided			---	---	---	---	---	ug		
Container # 3	IBT-3	04/17/00	04/18/00	sah	ND	ND	1.0	---	---	ug	*1, *2	
Container # 4	IBT-4	04/18/00	04/19/00	sah	<0.019	<0.019	<1.0	---	---	ug		
Container # 5	IBT-5	04/17/00	04/18/00	sah	<0.025	<0.025	<1.0	---	---	ug	*1	

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

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

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

Total Hg (ug) **0.00**
(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) **0.00**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:
*1 Reagent Blank Corrected
*2 The Reagent Blank result was slightly higher than the Stack Blank Train Result. This would calculate out to be a negative value.

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Unit 3 Stack Run 2

Hg Analysis
Ontario Hydro Method

Collected On: 3/29/00
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	47Q190	04/20/00	04/20/00	epk	0.0062	0.0059	5.0	---	---	ug		
Container # 1B		Did Not Provided			---	---	---	---	---	ug		
Container # 2	S2-2	04/17/00	04/18/00	sah	<0.0086	<0.0086	<1.0	---	---	ug		
Container # 3	S2-3	04/17/00	04/18/00	sah	38.3	39.0	1.5	---	---	ug		*1
Container # 4	S2-4	04/18/00	04/19/00	sah	0.322	0.314	2.6	---	---	ug		
Container # 5	S2-5	04/17/00	04/18/00	sah	8.66	8.57	1.1	---	---	ug		*1

Particle Bound Hg (ug) **0.006**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **38.30**
(Containers 3)

Elemental Hg (ug) **8.98**
(Containers 4 and 5)

Total Hg (ug) **47.29**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.006**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **39.00**
(Containers 3)

Dup. Elemental Hg (ug) **8.88**
(Containers 4 and 5)

Dup. Total Hg (ug) **47.89**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 Reagent Blank Corrected

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Unit 3 Stack Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 3/29/00
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	47Q191	04/20/00	04/20/00	epk	0.0076	0.0077	1.3	---	---	ug		
Container # 1B		Did Not Provided			---	---	---	---	---	ug		
Container # 2	S3-2	04/17/00	04/18/00	sah	<0.0095	<0.0095	<1.0	---	---	ug		
Container # 3	S3-3	04/17/00	04/18/00	sah	38.9	38.7	<1.0	---	---	ug		*1
Container # 4	S3-4	04/18/00	04/19/00	sah	0.178	0.171	4.0	---	---	ug		
Container # 5	S3-5	04/17/00	04/18/00	sah	6.83	6.85	<1.0	---	---	ug		*1

Particle Bound Hg (ug) **0.008**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **38.90**
(Containers 3)

Elemental Hg (ug) **7.01**
(Containers 4 and 5)

Total Hg (ug) **45.92**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.008**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **38.70**
(Containers 3)

Dup. Elemental Hg (ug) **7.02**
(Containers 4 and 5)

Dup. Total Hg (ug) **45.73**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 Reagent Blank Corrected

TestAmerica
INCORPORATED

Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Unit 3 Stack Run 4

Hg Analysis
Ontario Hydro Method

Collected On: 3/29/00
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	Filter	04/20/00	04/20/00	epk	0.0089	0.0086	4.0	---	---	ug		*2
Container # 1B		Not Provided			---	---	---	---	---	ug		
Container # 2	S4-2	04/17/00	04/18/00	sah	0.0023	0.0023	1.7	---	---	ug		
Container # 3	S4-3	04/17/00	04/18/00	sah	49.9	51.3	2.4	---	---	ug		*1
Container # 4	S4-4	04/18/00	04/19/00	sah	0.075	0.069	7.9	---	---	ug		
Container # 5	S4-5	04/17/00	04/18/00	sah	4.78	4.76	<1.0	---	---	ug		*1, *3

Particle Bound Hg (ug) **0.011**
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) **49.90**
(Containers 3)

Elemental Hg (ug) **4.86**
(Containers 4 and 5)

Total Hg (ug) **54.77**
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) **0.011**
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) **51.30**
(Containers 3)

Dup. Elemental Hg (ug) **4.83**
(Containers 4 and 5)

Dup. Total Hg (ug) **56.14**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:
*1 Reagent Blank Corrected
*2 No ID number was assigned to filter
*3 No run number was listed on bottle. All other Run numbers were accounted for.

TestAmerica
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Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Unit 3 Stack Blank Train

Collected On: 3/29/00
Collected By: METCO

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

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided			---	---	---	---	---	ug		
Container # 1B		Not Provided			---	---	---	---	---	ug		
Container # 2		Not Provided			---	---	---	---	---	ug		
Container # 3	SBT-3	04/17/00	04/18/00	sah	4.52	4.52	<1.0	---	---	ug	*1	
Container # 4	SBT-4	04/18/00	04/19/00	sah	0.030	0.029	4.1	---	---	ug		
Container # 5	SBT-5	04/17/00	04/18/00	sah	0.152	0.151	<1.0	---	---	ug	*1	

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

Oxidized Hg (ug) **4.52**
(Containers 3)

Elemental Hg (ug) **0.18**
(Containers 4 and 5)

Total Hg (ug) **4.70**
(Containers 1A, 1B, 2, 3, 4, and 5)

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

Dup. Oxidized Hg (ug) **4.52**
(Containers 3)

Dup. Elemental Hg (ug) **0.18**
(Containers 4 and 5)

Dup. Total Hg (ug) **4.70**
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: *1 Reagent Blank Corrected

TestAmerica
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Sample ID: **EPRI-Cinergy**
Owensville, Indiana

Hg Analysis
Ontario Hydro Method

Reagent Blanks

Collected On: 3/29/00
Collected By: METCO

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

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 7	IRB-7	---	04/18/00	sah	<0.050	<0.050	<1.0	---	---	ug/L		
Container # 8	IRB-8	04/17/00	04/18/00	sah	6.23	6.33	1.1	---	---	ug/L		
Container # 9	IRB-9	04/18/00	04/19/00	sah	<0.128	<0.128	<1.0	---	---	ug/L		
Container # 10	IRB-10	04/17/00	04/18/00	sah	0.071	0.069	2.9	---	---	ug/L		
Container # 11	IRB-11	---	04/18/00	sah	<0.050	<0.050	<1.0	---	---	ug/L		
Container # 12	47Q195	04/20/00	04/20/00	epk	<0.0025	<0.0025	<1.0	---	---	ug		*1

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

ASTM D6414-99 Results

TestAmerica
INCORPORATED

Sample ID: EPRI-Cinergy
Owensville, Indiana

Coal Samples

Collected On: 3/29/00
Collected By: METCO

Hg Analysis
ASTM D6414-99

	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Units	Dry Weight (%)	Flags	Notes
Run 2 Composite	4/25/00	4/26/00	epk	0.117	0.116	<1.0	ug/g	90.1		*1
Run 3 Composite	4/25/00	4/26/00	epk	0.115	0.115	<1.0	ug/g	90.7		*1, *2
Run 4 Composite	4/25/00	4/26/00	epk	0.123	0.125	2.1	ug/g	92.2		*1, *3

Notes:

* 1 No Chain of Custody was provided. Sample identified as "Test 1" is assumed to be Run 2 Composite. Sample identified as "Test 2" is assumed to be Run 3 Composite. Sample identified as "Test 3" is assumed to be Run 4 Composite.

*2 Sample was analyzed in triplicate. The triplicate result was 0.115 ug/g with an RPD of <1.0 %.

*3 Sample was spiked. The spike recovery was 112 %.

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

Sample Batch Preparation Records

Metco Coal Samples

Metals Batch Record Sheet

Prep Analyst: EPK Prep Code Number: — Date/Time: 4/25/00

Batch Number: — Batch Reference: — Batch Type: —

Standard Reference #:

A.S. #	Sample Number/Client		Prep Info
	~~MB~~		
	~~LCS~~		
	~~MS~~		
	~~MSD~~		
Bottle #	MB		
1	16302a	Trace Mercury	1.0019 g
2	1399815	Test 1	1.0053 g
4	1399816	Test 2	1.0044 g
5	1399817	Test 3	1.0030 g

	MB	LCS	MS	MSD	RPD	FL
Al						
Sb						
As						
Ba						
Be						
B						
Cd						
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Mo						
Ni						
K						
Se						
Si						
Ag						
Na						
Sr						
Tl						
Sn						
Ti						
V						
Zn						

HCl 67-39-4

HNO_3 67-35-11

$KMnO_4$ 67-38-19

$NH_2OH \cdot HCl$

NaCl

67-38-18

Comments: Hg STD 67-41-2

ICV STD 67-41-5

Mercury in Flue Gas

Aqueous Preparation Batch Log

Analyst(s) EPK Preparation Date 4/18/00 → 4/19/00

Reagent Reference #'s

HCl	67-35-17	$SnCl_2$	67-39-21
$NH_2OH*HCl$	67-18-18	Calibration Standards	67-29-15
$KMnO_4$	67-38-19	ICV Standard	67-29-17
HNO_3	N/A		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	9	IRB	50	15	38.25						
	4	SBT	180	15	34.25						
	4	S4	170	15	41.75						
	4	S3	170	15	44.25						
	4	S2	160	15	45.25						
	4	IBT	165	15	31.25						
	4	I4	150	15	47.25						
	4	I3	165	15	48.75						
	4	I2	185	15	25.75						
		Prep BLANK	—	15	16.75						

NOTES

Mercury in Flue Gas

Aqueous Preparation Batch Log

Analyst(s) EPK Preparation Date 4/17/00

Reagent Reference #'s

HCl	N/A	$SnCl_2$	67-38-22
$NH_2OH*HCl$	67-27-7	Calibration Standards	67-29-15
$KMnO_4$	N/A	ICV Standard	67-29-17
HNO_3	N/A		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	~~5~~	~~SB~~ EPK 4/17/00									
	10	IRB	46								
	5	SBT	490								
	5	S4	510								
	5	S3	490								
	5	S2	460								
	5	IBT	490								
	5	I4	490								
	5	I3	505								
	5	I2	470								
	7	IRB	49								
	11	IRB	99								

NOTES 99-95GIB3A ; Owensville, IN
Unit 3 Stack and Unit 3 Precipitation Inlet Duct

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) EPK Preparation Date 4/17/00

Reagent Reference #'s

HCl	N/A	$SnCl_2$	67-38-22
$NH_2OH*HCl$	67-18-18	Calibration Standards	67-29-15
$KMnO_4$	67-34-11	ICV Standard	67-29-17
HNO_3	67-38-7	$K_2S_2O_8$	67-37-13
H_2SO_4	67-31-7		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	3	SBT	485	20	~~24~~ 28
	3	S4	790	20	JAD 5/7
	3	S3	810	20	
	3	S2	770	20	
	3	IBT	490	20	
	3	I4	770	20	
	3	I3	790	20	
	3	I2	790	20	

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	2	S4	27	20	~~24~~ 28
	2	S3	136	20	JAD 5/7
	2	S2	123	20	
	2	I4	97	20	
	2	I3	79	20	
	2	I2	80	20	
	8	IRB	49	20	

NOTES 99-95 GIB3A, Owensville, IN
Unit 3 Stack and Unit 3 Precipitation Inlet Duct

Mercury in Flue Gas
Filter Preparation Batch Log

Analyst(s) EPK Preparation Date 4/20/00

Reagent Reference #'s

HCl	67-35-17	$SnCl_2$	67-40-13
$NH_2OH*HCl$	N/A	Calibration Standards	67-29-15
$KMnO_4$	N/A	ICV Standard	67-29-17
HNO_3	67-38-7	HF	67-21-14
Boric Acid	67-40-10		

Lab ID	Filter ID	Sample Description	Final Vol (mL)	Lab ID	Filter ID	Sample Description	Final Vol (mL)
	—	~~BLANK~~ EPK 4/20/00					
1	47Q190		50mL				
2	47Q191						
3	Filter						
4	47Q193						
5	47Q194						
6	47Q198						
7	Q126	0.5005g					
8	Q127	0.5123g					
9	Q128	0.5547g					
10	1633b	0.5397g					
11	47Q195						
12	—	BLANK					

NOTES Cinergy Owensville, IN
Job # 99-95 GIB3A

TestAmerica

4/18/2000 Analytical Data

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 13:06:04  18 Apr 2000
Folder: 18APR00A   Seq: 31                     Print: On
User:              Batch:
                                Id: Ck2        Cup:      Gas:    0.23 LPM
State: Idle                                    Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 041800A

Cup Id          Extended Id          Weight Volume Macro Check Help
 1 ICB                                1.0000 1.0000
 2 IRB 10                             1.0000 1.0000
 3 IRB 10 DUP                         1.0000 1.0000
 4 SBT-5                              1.0000 1.0000
 5 SBT-5 DUP                          1.0000 1.0000
 6 S4-5          1:5                  1.0000 1.0000
 7 S4-5 DUP      1:5                  1.0000 1.0000
 8 S3-5          1:5                  1.0000 1.0000
 9 S3-5 DUP      1:5                  1.0000 1.0000
10 S2-5          1:10                 1.0000 1.0000
11 S2-5 DUP      1:10                 1.0000 1.0000
12 IBT-5         1                    1.0000 1.0000
13 IBT-5 DUP                          1.0000 1.0000
14 I4-5         1:5                   1.0000 1.0000
15 I4-5 DUP     1:5                   1.0000 1.0000
                                                                    PgDn

Cup 1  ID: ICB                                Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 13:06:49  18 Apr 2000
Folder: 18APR00A   Seq: 31                     Print: On
User:              Batch:          Id: Ck2        Cup:     Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 041800A                                  PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 I3-5         1:5                  1.00000 1.00000
17 I3-5 DUP     1:5                  1.00000 1.00000
18 I3-5 TRP     1:5                  1.00000 1.00000
19 I2-5         1:5                  1.00000 1.00000
20 I2-5 DUP     1:5                  1.00000 1.00000
21 I2-5 SPK     1:5 → 1:2            1.00000 1.00000
22 CCB                               1.00000 1.00000
23 CCV                               1.00000 1.00000
24                                   1.00000 1.00000
25                                   1.00000 1.00000
26                                   1.00000 1.00000
27                                   1.00000 1.00000
28                                   1.00000 1.00000
29                                   1.00000 1.00000
30                                   1.00000 1.00000
                                                                           PgDn

Cup 16 ID: I3-5                                   Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 16:20:16  18 Apr 2000
Folder: 18APR00A   Seq: 74                     Print: On
User:              Batch:        Id: Ck2        Cup: 1 23 Gas:    0.23 LPM
State: Idle                                     Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 0418008
Cup Id        Extended id          Weight Volume Macro check Help
 1 ICB                             1.0000 1.0000
 2 PREP BLK                        1.0000 1.0000
 3 PREPSL DUP                      1.0000 1.0000
 4 SBT3      1/10                  1.0000 1.0000
 5 SBT3 DUP  1/10                  1.0000 1.0000
 6 S4 3      1/20                  1.0000 1.0000
 7 S4 3 DUP  1/20                  1.0000 1.0000
 8 S3 3      1/20                  1.0000 1.0000
 9 S3 3 DUP  1/20                  1.0000 1.0000
10 S2 3      1/20                  1.0000 1.0000
11 S2 3 DUP  1/20                  1.0000 1.0000
12 IBT 3     1/5                   1.0000 1.0000
13 IBT 3 DUP 1/5                   1.0000 1.0000
14 I4 3      1/40  1/40            1.0000 1.0000
15 I4 3 DUP  1/40  1/40            1.0000 1.0000
                                                                  PgDn

Cup 1  ID: ICB                          Cell entry, Ins to switch
```

Protocol: SYSTEST labsys2
Rev: 3.001 Time: 16:20:20 18 Apr 2000
Folder: 18APR00A Seq: 74 Print: On
User: Batch: Id: Ck2 Cup: 1 23 Gas: 0.23 LPM
State: Idle Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 0418000B PgUp

Cup Id	Extended id	Weight	Volume	Macro check	Help
16 I3 3	1/20	1.00000	1.00000		
17 I3 3 DUP	1/20	1.00000	1.00000		
18 I3 3 TRIP	1/20	1.00000	1.00000		
19 I2 3	1/20 1/4	1.00000	1.00000		
20 I2 3 DUP	1/20 1/4	1.00000	1.00000		
21 I2 3 SPIKE	1/2, 1/4	1.00000	1.00000		
22 CCV		1.00000	1.00000		
23 CCB		1.00000	1.00000		
24 IRB 7		1.00000	1.00000		
25 IRB 7 DUP		1.00000	1.00000		
26 IRB 11		1.00000	1.00000		
27 IRB 11 DUP		1.00000	1.00000		
28 S4 2		1.00000	1.00000		
29 S4 2 DUP		1.00000	1.00000		
30 S3 2		1.00000	1.00000		

PgDn

Cup 16 ID: I3 3 Cell entry, Ins to switch

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 16:20:21  18 Apr 2000
Folder: 18APR00A   Seq: 74
User:                           Print: On
State: Idle        Batch:       Id: Ck2        Cup: 1 23 Gas:    0.23 LPM
                                               Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 041800B                                PgUp
cup Id        Extended id          Weight Volume Macro check Help
31 S3 2 DUP                        1.0000 1.0000
32 S2 2                            1.0000 1.0000
33 S2 2 DUP                        1.0000 1.0000
34 I4 2                            1.0000 1.0000
35 I4 2 DUP                        1.0000 1.0000
36 I3 2                            1.0000 1.0000
37 I3 2 DUP                        1.0000 1.0000
38 I2 2                            1.0000 1.0000
39 I2 2 DUP                        1.0000 1.0000
40 I2 2 TRIP                       1.0000 1.0000
41 IRB 8                           1.0000 1.0000
42 IRB 8 DUP                       1.0000 1.0000
43 IRB 8 SPIK                      1.0000 1.0000
44 CCV                             1.0000 1.0000
                                                                       PgDn
Cup 31 ID: S3 2 DUP                          Call entry, Ins to switch
```

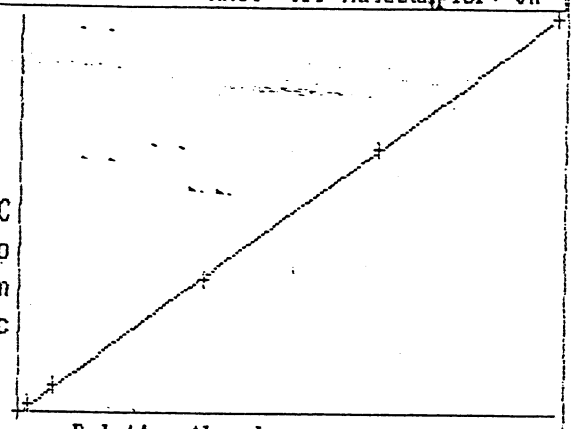
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 12:53:39 18 Apr 2000
Folder: 18APR00A Seq: 30 Print: On
User: Batch: Id: Std6Rep1 Cup: Gas: 8.23 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear
S1	.000	-.008	-.008	Quadratic
S2	.050	.045	-.005	WtdLinear
S3	.200	.195	-.005	C
S4	1.00	1.03	.031	Accept o
S5	2.00	1.99	-.008	n
S6	3.00	2.99	-.005	StdAdd c

A .0000000 r .999922
B 9.79138e-6 C -1.27298e-2



	Mean	%RSD	
S1	531	0	531
S2	5870	0	5870
S3	21177	0	21177
S4	106610	0	106610
S5	204750	0	204750
S6	307179	0	307179

New calibration coefficients stored

12:58:17 18 Apr 2000 Folder: 18APR00A Page 4
Protocol: SYSTEST labsys2

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

*** Check Standard: 2 Ck2 Seq: 30 12:58:17 18 Apr 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		91.1	.547	.600	ug/L	.000

DATA = BLANK CORRECTED

13:12:44 18 Apr 2000 Folder: 18APR00A Protocol: SYSTEST labsys2 Page 5

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ICB					Seq: 31	13:12:44 18 Apr 2000 HG		
Hg	-.021	ug/L	.000	-.021				<0.050 ug/L
*** Sample ID: CCV					Seq: 32	13:17:54 18 Apr 2000 HG		
Hg	2.03	ug/L	.000	2.03				102 %
*** Sample ID: IRB 10					Seq: 33	13:20:18 18 Apr 2000 HG		
Hg	.077	ug/L	.000	.077				REPEAT
*** Sample ID: IRB 10 DUP					Seq: 34	13:22:31 18 Apr 2000 HG		
Hg	.065	ug/L	.000	.065				
*** Sample ID: IRB 10					Seq: 35	13:24:46 18 Apr 2000 HG		
Hg	.058	ug/L	.000	.058				
*** Sample ID: IRB 10 DUP					Seq: 36	13:26:59 18 Apr 2000 HG		
Hg	.043	ug/L	.000	.043				
*** Sample ID: CCB					Seq: 37	13:32:50 18 Apr 2000 HG		
Hg	-.020	ug/L	.000	-.020				<0.050 ug/L
*** Sample ID: CCV					Seq: 38	13:35:04 18 Apr 2000 HG		
Hg	2.00	ug/L	.000	2.00				100 %
*** Sample ID: IRB 10					Seq: 39	13:41:24 18 Apr 2000 HG		
Hg	.048	ug/L	.000	.048				REPEAT
*** Sample ID: IRB 10 DUP					Seq: 40	13:43:37 18 Apr 2000 HG		
Hg	.069	ug/L	.000	.069				
*** Sample ID: IRB 10					Seq: 41	13:49:34 18 Apr 2000 HG		
Hg	.088	ug/L	.000	.088				
*** Sample ID: IRB 10					Seq: 42	14:04:40 18 Apr 2000 HG		
Hg	.060	ug/L	.000	.060				

DATA = BLANK CORRECTED

14:06:53 18 Apr 2000 Folder: 18APR00A Protocol: SYSTEST labsys2 Page 6

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: IRB 10 DUP					Seq: 43	14:06:53 18 Apr 2000 HG		
Hg	.068	ug/L	.000	.068				
*** Sample ID: SBT-5					Seq: 44	14:10:39 18 Apr 2000 HG		
Hg	.381	ug/L	.000	.381				
*** Sample ID: SBT-5 DUP					Seq: 45	14:12:52 18 Apr 2000 HG		
Hg	.380	ug/L	.000	.380				
*** Sample ID: S4-5					Seq: 46	14:15:05 18 Apr 2000 HG		
Hg	1.89	ug/L	.000	1.89				
*** Sample ID: S4-5 DUP					Seq: 47	14:17:23 18 Apr 2000 HG		
Hg	1.88	ug/L	.000	1.88				
*** Sample ID: S3-5					Seq: 48	14:19:48 18 Apr 2000 HG		
Hg	2.80	ug/L	.000	2.80				
*** Sample ID: S3-5 DUP					Seq: 49	14:22:17 18 Apr 2000 HG		
Hg	2.81	ug/L	.000	2.81				
*** Sample ID: S2-5					Seq: 50	14:24:43 18 Apr 2000 HG		
Hg	3.70	ug/L	.000	3.70				
*** Sample ID: S2-5 DUP					Seq: 51	14:27:13 18 Apr 2000 HG		
Hg	3.71	ug/L	.000	3.71				
*** Sample ID: IBT-5					Seq: 52	14:29:38 18 Apr 2000 HG		
Hg	.041	ug/L	.000	.041				
*** Sample ID: IBT-5 DUP					Seq: 53	14:31:51 18 Apr 2000 HG		
Hg	.051	ug/L	.000	.051				
*** Sample ID: I4-5					Seq: 54	14:34:04 18 Apr 2000 HG		
Hg	1.03	ug/L	.000	1.03				

REPEAT

0.152 ug

RPD - <1.0

0.151 ug

4.78 ug

RPD - <1.0

4.76 ug

6.83 ug

RPD - <1.0

6.85 ug

REPEAT

REPEAT

REPEAT

2.49 ug

DATA = BLANK CORRECTED

14:36:20 18 Apr 2000 Folder: 18APR00A Protocol: SYSTEST labsys2 Page 7

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: I4-5 DUP					Seq: 55	14:36:20 18 Apr 2000 HG RPD - <1.0		
Hg	1.03	ug/L	.000	1.03		2.49 ug		
*** Sample ID: I3-5					Seq: 56	14:38:36 18 Apr 2000 HG		
Hg	1.74	ug/L	.000	1.74		4.36 ug		
*** Sample ID: I3-5 DUP					Seq: 57	14:40:54 18 Apr 2000 HG RPD - <1.0		
Hg	1.74	ug/L	.000	1.74		4.36 ug		
*** Sample ID: I3-5 TRP					Seq: 58	14:43:12 18 Apr 2000 HG RPD - ~~<1.0~~ JAN 4/23		
Hg	1.70	ug/L	.000	1.70		4.26 ug		
*** Sample ID: I2-5					Seq: 59	14:45:32 18 Apr 2000 HG		
Hg	2.65	ug/L	.000	2.65		6.19 ug		
*** Sample ID: I2-5 DUP					Seq: 60	14:47:56 18 Apr 2000 HG RPD: 1.1		
Hg	2.68	ug/L	.000	2.68		6.27 ug		
*** Sample ID: I2-5 SPK					Seq: 61	14:50:22 18 Apr 2000 HG		
Hg	3.73	ug/L	.000	3.73		REPEAT		
*** Sample ID: CCB					Seq: 62	14:52:51 18 Apr 2000 HG		
Hg	-.026	ug/L	.000	-.026		<0.050 ug/L		
*** Sample ID: CCV					Seq: 63	14:55:05 18 Apr 2000 HG		
Hg	2.03	ug/L	.000	2.03		102%		
*** Sample ID: IRB 10					Seq: 64	14:59:59 18 Apr 2000 HG		
Hg	.071	ug/L	.000	.071		0.071 ug/L		
*** Sample ID: IRB 10 DUP					Seq: 65	15:02:12 18 Apr 2000 HG		
Hg	.069	ug/L	.000	.069		0.069 ug/L ~~0.071 ug/L~~ JAN 4/23		
*** Sample ID: S2-5					Seq: 66	15:06:19 18 Apr 2000 HG		
Hg	1.89	ug/L	.000	1.89		~~0.069 ug/L~~ JAN 4/23		

8.66 ug

DATA = BLANK CORRECTED

15:08:38 18 Apr 2000 Folder: 18APR00A Protocol: SYSTEST labsys2 Page 8

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: S2-5 DUP					Seq: 67	15:08:38 18 Apr 2000 HG		
Hg	1.87	ug/L	.000	1.87				
*** Sample ID: IBT-5					Seq: 68	15:11:00 18 Apr 2000 HG		
Hg	.040	ug/L	.000	.040				
*** Sample ID: IBT-5 DUP					Seq: 69	15:13:13 18 Apr 2000 HG		
Hg	.032	ug/L	.000	.032				
*** Sample ID: I2-5 SPK					Seq: 70	15:17:37 18 Apr 2000 HG		
Hg	1.92	ug/L	.000	1.92				
*** Sample ID: CCB					Seq: 71	15:20:07 18 Apr 2000 HG		
Hg	-.030	ug/L	.000	-.030				
*** Sample ID: CCV					Seq: 72	15:22:21 18 Apr 2000 HG		
Hg	2.02	ug/L	.000	2.02				

8.57 ug

<0.025 ug

<0.025 ug

SPK - 2.35
RESULT - 8.99

119%

<0.050 ug/L

101%

DATA = BLANK CORRECTED

16:21:47 18 Apr 2000 Folder: 18APR00A Page 9
Protocol: SYSTEST labsys2

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

*** Check Standard: 2 CK2 Seq: 74 16:21:47 18 Apr 2000 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 94.8 .569 .600 ug/L .000

*** Sample ID: ICB Seq: 75 16:32:55 18 Apr 2000 HG
Hg -.018 ug/L .000 -.018 <0.050 ug/L

*** Sample ID: PREP BLK Seq: 76 16:35:08 18 Apr 2000 HG
Hg -.004 ug/L .000 -.004 <0.050 ug/L

*** Sample ID: PREPBL DUP Seq: 77 16:37:21 18 Apr 2000 HG
Hg -.005 ug/L .000 -.005 <0.050 ug/L

*** Sample ID: SBT3 Seq: 78 16:39:34 18 Apr 2000 HG
Hg 10.6 ug/L .000 10.6 REPEAT

*** Sample ID: SBT3 (10x) Seq: 79 16:43:46 18 Apr 2000 HG
Hg 1.11 ug/L .000 1.11 JAD 5/7 4.52 ug ~~5.37~~ ug

*** Sample ID: SBT3 DUP (10x) Seq: 80 16:46:02 18 Apr 2000 HG
Hg 1.11 ug/L .000 1.11 RPD - <1.0 4.52 ~~5.37~~ ug JAD 5/7

*** Sample ID: S4 3 ~~(20x)~~ JAD 4/24 Seq: 81 16:48:25 18 Apr 2000 HG
Hg 36.4 ug/L .000 36.4 REPEAT

*** Sample ID: S4 3 (20x) Seq: 82 16:51:45 18 Apr 2000 HG
Hg 2.48 ug/L .000 2.48 JAD 5/7 49.9 ~~51.3~~ ug

*** Sample ID: S4 3 DUP (20x) Seq: 83 16:54:100180Qpr020000xwxw000=>0270000
uw?\0000000>00000000=>027

*** Sample ID: S4 3 DUP Seq: 84 16:56:31 18 A
pr 2000 HG SMD 4/24
RPD - <1.0 % 2.4
Hg 2.54 ug/L .000 2.54 51.3 ~~52.7~~ ug

*** Sample ID: S3 3 Seq: 85 16:58:57 18 Apr 2000 HG SMD 5/7
Hg 30.1 ug/L .000 30.1 REPEAT

DATA = BLANK CORRECTED

17:02:13 18 Apr 2000 Folder: 18APR00A Page 10
Protocol: SYSTEST labsys2

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: S3 3 (20x)				Seq: 86		17:02:13 18 Apr 2000 HG		
Hg	1.94	ug/L	.000	1.94		38.9 ~~40.4~~ ug JAO 5/7		
*** Sample ID: S3 3 DUP (20x)				Seq: 87		17:04:42 18 Apr 2000 HG		RPD <1.0%
Hg	1.93	ug/L	.000	1.93		38.7 ~~40.2~~ ug JAO 5/7		
*** Sample ID: S2 3 ~~(20x)~~ JAO 4/24				Seq: 88		17:07:06 18 Apr 2000 HG		
Hg	30.7	ug/L	.000	30.7				REPEAT
*** Sample ID: S2 3 (20x)				Seq: 89		17:10:17 18 Apr 2000 HG		
Hg	2.00	ug/L	.000	2.00		38.3 ~~39.7~~ ug JAO 5/7		
*** Sample ID: S2 3 DUP (20x)				Seq: 90		17:12:41 18 Apr 2000 HG		RPD 1.5%
Hg	2.03	ug/L	.000	2.03		39.0 ~~40.3~~ ug JAO 5/7		
*** Sample ID: IBT 3 ~~(5x)~~ JAO 4/24				Seq: 91		17:28:19 18 Apr 2000 HG		
Hg	3.83	ug/L	.000	3.83				REPEAT
*** Sample ID: IBT 3 (5x)				Seq: 92		17:31:15 18 Apr 2000 HG		
Hg	.793	ug/L	.000	.793		0.53 ug		
*** Sample ID: IBT 3 DUP (5x)				Seq: 93		17:33:28 18 Apr 2000 HG		RPD <4.0% JAO 1.0 4/24
Hg	.785	ug/L	.000	.785		0.50 ug		
*** Sample ID: I4 3 ~~(40x)~~ JAO 4/24				Seq: 94		17:35:46 18 Apr 2000 HG		
Hg	45.8	ug/L	.000	45.8				REPEAT
*** Sample ID: I4 3 ~~(40x)~~ 20x JAO 4/24				Seq: 95		17:49:37 18 Apr 2000 HG		
Hg	3.27	ug/L	.000	3.27				REPEAT
*** Sample ID: I4 3 DUP No Data Empty tube				Seq: 96		17:52:11 18 Apr 2000 HG		
Hg	-.038	ug/L	.000	-.038				REPEAT
*** Sample ID: I4 3 DUP ~~(40x)~~ 20x JAO 4/24				Seq: 97		17:54:35 18 Apr 2000 HG		
Hg	3.43	ug/L	.000	3.43				REPEAT

DATA = BLANK CORRECTED

17:57:02 18 Apr 2000 Folder: 18APR00A Protocol: SYSTEST labsys2 Page 11

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: I3 3 ~~(20x)~~ JAD 4/24					Seq: 98	17:57:02 18 Apr 2000 HG		
Hg	41.2	ug/L	.000	41.2				
*** Sample ID: I3 3 (20x)					Seq: 99	18:00:36 18 Apr 2000 HG		
Hg	2.90	ug/L	.000	2.90				
*** Sample ID: I3 3 DUP (20x)					Seq: 100	18:02:54 18 Apr 2000 HG		
Hg	2.96	ug/L	.000	2.96				
*** Sample ID: I3 3 TRIP (20x)					Seq: 101	18:05:18 18 Apr 2000 HG		
Hg	2.82	ug/L	.000	2.82				
*** Sample ID: I4 3 (40x)					Seq: 102	19:00:35 18 Apr 2000 HG		
Hg	1.73	ug/L	.000	1.73				
*** Sample ID: I4 3 DUP (40x)					Seq: 103	19:03:00 18 Apr 2000 HG		
Hg	1.71	ug/L	.000	1.71				
*** Sample ID: I2 3					Seq: 104	19:05:23 18 Apr 2000 HG		
Hg	34.7	ug/L	.000	34.7				
*** Sample ID: I2 3 ~~(40x)~~ 20x JAD 4/24					Seq: 105	19:08:42 18 Apr 2000 HG		
Hg	1.93	ug/L	.000	1.93				
*** Sample ID: I2 3 DUP ~~(40x)~~ 20x JAD 4/24					Seq: 106	19:12:18 18 Apr 2000 HG		
Hg	1.90	ug/L	.000	1.90				
*** Sample ID: I2 3 SPIKE					Seq: 107	19:16:16 18 Apr 2000 HG		
Hg	3.35	ug/L	.000	3.35				
*** Sample ID: I2 3 (40x)					Seq: 108	20:00:14 18 Apr 2000 HG		
Hg	1.17	ug/L	.000	1.17				
*** Sample ID: I2 3 DUP (40x)					Seq: 109	20:02:33 18 Apr 2000 HG		
Hg	1.18	ug/L	.000	1.18				

REPEAT

59.2 ~~60.6~~ ug JAD 5/7 RPD - 2.0%

60.6 ~~61.9~~ ug JAD 5/7 RPD 2.8%

57.5 ~~58.8~~ ug JAD 5/7

69.8 ~~71.2~~ ug JAD 5/7 RPD 1.1%

68.9 ~~70.3~~ ug JAD 5/7

REPEAT

REPEAT

REPEAT

REPEAT

46.8 ~~48.2~~ ug JAD 5/7 RPD <1.0

JAD 4/24 ~~48.2 ug~~ 47.3 ug

DATA = BLANK CORRECTED

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: I2-3 SPIKE (40x)				Seq: 110	20:05:25 18 Apr 2000 HG			
Hg	2.23	ug/L	.000	2.23				
*** Sample ID: CCV				Seq: 111	20:08:22 18 Apr 2000 HG			
Hg	2.01	ug/L	.000	2.01				
*** Sample ID: CCB				Seq: 112	20:10:51 18 Apr 2000 HG			
Hg	-.020	ug/L	.000	-.020				
*** Sample ID: IRB 7				Seq: 113	20:13:13 18 Apr 2000 HG			
Hg	-.009	ug/L	.000	-.009				
*** Sample ID: IRB 7 DUP				Seq: 114	20:15:58 18 Apr 2000 HG			
Hg	-.017	ug/L	.000	-.017				
*** Sample ID: IRB 11				Seq: 115	20:18:12 18 Apr 2000 HG			
Hg	-.021	ug/L	.000	-.021				
*** Sample ID: IRB 11 DUP				Seq: 116	20:22:00 18 Apr 2000 HG			
Hg	-.026	ug/L	.000	-.026				
*** Sample ID: S4 2				Seq: 117	20:26:15 18 Apr 2000 HG			
Hg	.060	ug/L	.000	.060				
*** Sample ID: S4 2 DUP				Seq: 118	20:28:29 18 Apr 2000 HG			
Hg	.061	ug/L	.000	.061				
*** Sample ID: S3 2				Seq: 119	20:30:43 18 Apr 2000 HG			
Hg	.006	ug/L	.000	.006				
*** Sample ID: S3 2 DUP				Seq: 120	20:36:16 18 Apr 2000 HG			
Hg	.008	ug/L	.000	.008				
*** Sample ID: S2 2				Seq: 121	20:38:30 18 Apr 2000 HG			
Hg	.045	ug/L	.000	.045				

JAD 4/24

~~RPD - <1.0~~

SPIKE - 44.2

RESULT ~~98.7~~ 93.8

~~46.7 ug~~ 106%

101%

<0.050 ug/L

<0.050 ug/L RPD - <1.0%

<0.050 ug/L

<0.050 ug/L

<0.050 ug/L RPD - <1.0%

<0.050 ug/L

0.0023 ug RPD - 1.7%

0.0023 ug

<0.0095 ug RPD - <1.0%

<0.0095 ug

<0.0086 ug

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: S2 2 DUP					Seq: 122	20:44:44 18 Apr 2000 HG RPD - <1.0%		
Hg	.044	ug/L	.000	.044		<0.0086 ug		
*** Sample ID: I4 2					Seq: 123	20:48:42 18 Apr 2000 HG		
Hg	.075	ug/L	.000	.075		REPEAT		
*** Sample ID: I4 2 DUP					Seq: 124	20:50:58 18 Apr 2000 HG		
Hg	-.018	ug/L	.000	-.018		REPEAT		
*** Sample ID: I3 2					Seq: 125	20:53:13 18 Apr 2000 HG		
Hg	-.010	ug/L	.000	-.010		<0.0055 ug		
*** Sample ID: I3 2 DUP					Seq: 126	20:57:32 18 Apr 2000 HG RPD - <1.0%		
Hg	-.010	ug/L	.000	-.010		<0.0055 ug		
*** Sample ID: I4 2					Seq: 127	21:12:43 18 Apr 2000 HG		
Hg	.141	ug/L	.000	.141		0.019 ug		
*** Sample ID: I4 2 DUP					Seq: 128	21:14:58 18 Apr 2000 HG RPD - 4.0%		
Hg	.148	ug/L	.000	.148		0.020 ug		
*** Sample ID: I2 2					Seq: 129	21:18:14 18 Apr 2000 HG		
Hg	.226	ug/L	.000	.226		0.025 ug		
*** Sample ID: I2 2 DUP					Seq: 130	21:20:30 18 Apr 2000 HG RPD - 1.3%		
Hg	.229	ug/L	.000	.229		0.026 ug		
*** Sample ID: I2 2 TRIP					Seq: 131	21:23:01 18 Apr 2000 HG RPD - 5.0%		
Hg	.215	ug/L	.000	.215		0.024 ug		
*** Sample ID: IRB 8					Seq: 132	21:25:38 18 Apr 2000 HG		
Hg	4.41	ug/L	.000	4.41		REPEAT		
*** Sample ID: IRB 8					Seq: 133	21:28:28 18 Apr 2000 HG		
Hg	.447	ug/L (10X)	.000	.447		6.23 ~~4.47~~ ug/L SAD 5/7		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: IRB 8 DUP				Seq: 134	21:35:43 18 Apr 2000 HG			
Hg	.452	ug/L	.000 (10X)	.452				
*** Sample ID: IRB 8 SPIK				Seq: 135	21:38:00 18 Apr 2000 HG			
Hg	1.45	ug/L	.000 (10X)	1.45				
*** Sample ID: CCV				Seq: 136	21:40:21 18 Apr 2000 HG			
Hg	1.93	ug/L	.000	1.93				
*** Sample ID: CCB				Seq: 137	21:42:47 18 Apr 2000 HG			
Hg	-.025	ug/L	.000	-.025				

~~4.52~~ 6.33 ~~4.47~~ ug/L
JAD 4/24

14

SPK - ~~10~~ 20 ug/L
JAD 5/7

RESULT ~~14.5~~ 20.3 ug/L

100 %

96 %

<0.050 ug/L

4/19/2000 Analytical Data

Protocol: SYSTEST labsys2

Folder: 19APR00C
User:
State: Idle

Rev: 3.001 Time: 17:10:45 19 Apr 2000
Seq: 61 Print: On
Batch: Id: Ck2 Cup: 1 11 Gas: 0.23 LP
Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack 041900M Pg

Cup	Id	Extended id	Weight	Volume	Macro	check	Help
16	I4 4		1.0000	1.0000			
17	I4 4 DUP		1.0000	1.0000			
18	I3 4		1.0000	1.0000			
19	I3 4 DUP		1.0000	1.0000			
20	I3 4 TRIP		1.0000	1.0000			
21	I2 4		1.0000	1.0000			
22	I2 4 DUP		1.0000	1.0000			
23	I2 4 SPIK		1.0000	1.0000			
24	DIV		1.0000	1.0000			
25	DDB		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			

Pg2

Cup 26 ID: Call entry, Ins to switch

*** Standard: 1 Rep: 1 Seq: 55 16:42:49 19 Apr 2000 HG

Hg .000 ug/L -12

Ave. Int. = -12 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 56 16:45:06 19 Apr 2000 HG

Hg .050 ug/L 5283

Ave. Int. = 5283 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 57 16:47:23 19 Apr 2000 HG

Hg .200 ug/L 20773

Ave. Int. = 20773 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 58 16:49:41 19 Apr 2000 HG

Hg 1.00 ug/L 97005

Ave. Int. = 97005 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 59 16:52:01 19 Apr 2000 HG

Hg 2.00 ug/L 187250

Ave. Int. = 187250 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 60 16:55:54 19 Apr 2000 HG

Hg 3.00 ug/L 278634

Ave. Int. = 278634 S. D. = 0

Protocol: SYSTEST labsys2

Rev: 3.001 Time: 17:03:59 19 Apr 2000

Folder: 19APR00C Seq: 61 Print: On

User: Batch: Id: Std6Rep1 Cup: 1 11 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

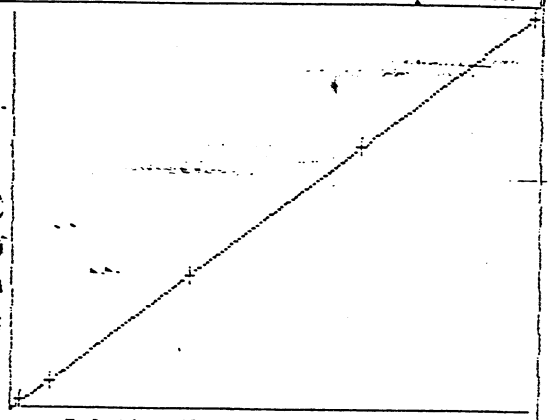
Line: Hg

	Conc.	Calc.	Dev.	Accepted
S1	.000	-.017	-.017	LiNear
S2	.050	.048	-.010	Quadratic
S3	.200	.207	.007	WtdLinear
S4	1.00	1.03	.029	Accept
S5	2.00	2.00	.002	
S6	3.00	2.99	-.012	StdAdd

Conc

A .0000000 r .999984

B 1.07834e-5 C -1.67847e-2



Relative Absorbance

	Mean	%RSD	
S1	-12	0	-12
S2	5283	0	5283
S3	28773	0	28773
S4	97005	0	97005
S5	187250	0	187250
S6	278634	0	278634

New calibration coefficients stored

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

*** Check Standard: 2 Ck2 Seq: 61 17:14:11 19 Apr 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	.607	.600	ug/L	.000

*** Sample ID: ICB Seq: 62 17:16:26 19 Apr 2000 HG

Hg -.020 ug/L .000 -.020 <0.050 ug/L

*** Sample ID: PREP BLK Seq: 63 17:18:39 19 Apr 2000 HG

Hg -.015 ug/L .000 -.015 <0.050 ug/L

*** Sample ID: P BLK DUP Seq: 64 17:20:52 19 Apr 2000 HG RPD - <

Hg -.027 ug/L .000 -.027 <0.050 ug/L

*** Sample ID: IRB 9 Seq: 65 17:23:58 19 Apr 2000 HG

Hg -.011 ug/L .000 -.011 <0.128 ug/L

*** Sample ID: IRB 9 DUP Seq: 66 17:26:11 19 Apr 2000 HG RPD - <1

Hg .000 ug/L .000 .000 <0.128 ug/L

*** Sample ID: SBT 4 Seq: 67 17:28:24 19 Apr 2000 HG

Hg .081 ug/L .000 .081 REPEAT

*** Sample ID: SBT 4 DUP Seq: 68 17:32:54 19 Apr 2000 HG

Hg .073 ug/L .000 .073 REPEAT

*** Sample ID: SBT 4 Seq: 69 17:35:26 19 Apr 2000 HG

Hg .074 ug/L .000 .074 0.030 ug

*** Sample ID: SBT 4 DUP Seq: 70 17:37:40 19 Apr 2000 HG RPD - 4.1

Hg .071 ug/L .000 .071 0.029 ug

*** Sample ID: S4 4 Seq: 71 17:39:53 19 Apr 2000 HG

Hg .158 ug/L .000 .158 0.075 ug

*** Sample ID: S4 4 DUP Seq: 72 17:42:06 19 Apr 2000 HG RPD- 7.9

Hg .146 ug/L .000 .146 0.069 ug

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: S3 4					Seq: 73	17:44:19 19 Apr 2000 HG		
Hg	.355	ug/L	.000	.355		0.178 ug		
*** Sample ID: S3 4 DUP					Seq: 74	17:46:35 19 Apr 2000 HG RPD - 4.		
Hg	.341	ug/L	.000	.341		0.171 ug		
*** Sample ID: S2 4					Seq: 75	17:48:53 19 Apr 2000 HG		
Hg	.626	ug/L	.000	.626		0.322 ug		
*** Sample ID: S2 4 DUP					Seq: 76	17:51:11 19 Apr 2000 HG RPD - 2.		
Hg	.610	ug/L	.000	.610		0.314 ug		
*** Sample ID: IBT 4					Seq: 77	17:53:34 19 Apr 2000 HG		
Hg	.019	ug/L	.000	.019		<0.019 ug		
*** Sample ID: IBT 4 DUP					Seq: 78	17:58:35 19 Apr 2000 HG RPD - <1.		
Hg	.030	ug/L	.000	.030		<0.019 ug		
*** Sample ID: I4 4					Seq: 79	18:00:49 19 Apr 2000 HG		
Hg	.216	ug/L	.000	.216		0.102 ug		
*** Sample ID: I4 4 DUP					Seq: 80	18:03:02 19 Apr 2000 HG RPD - 7.1		
Hg	.201	ug/L	.000	.201		0.095 ug		
*** Sample ID: I3 4					Seq: 81	18:05:15 19 Apr 2000 HG		
Hg	.355	ug/L	.000	.355		0.190 ug		
*** Sample ID: I3 4 DUP					Seq: 82	18:10:30 19 Apr 2000 HG RPD - 2.0		
Hg	.362	ug/L	.000	.362		0.194 ug		
*** Sample ID: I3 4 TRIP					Seq: 83	18:12:44 19 Apr 2000 HG		
Hg	-.031	ug/L	.000	-.031		REPEAT		
*** Sample ID: I3 4 TRIP					Seq: 84	18:15:41 19 Apr 2000 HG RPD - 6.		
Hg	.333	ug/L	.000	.333		0.179 ug		

IJ: Data Missed MP

18:23:14 19 Apr 2000 - Folder: 19APR00C
Protocol: SYSTEST labsys2 Page 30

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: I2 4								
Hg	.509	ug/L	.000	.509				
*** Sample ID: I2 4 DUP								
Hg	.503	ug/L	.000	.503				
*** Sample ID: I2 4 SPIK								
Hg	1.54	ug/L	.000	1.54				
*** Sample ID: CCV								
Hg	2.01	ug/L	.000	2.01				
*** Sample ID: CCB								
Hg	-.034	ug/L	.000	-.034				

Seq: 85 18:23:14 19 Apr 2000 HG
0.287 ug

Seq: 86 18:25:33 19 Apr 2000 HG RPD - 1.1%
0.284 ug

Seq: 87 18:30:08 19 Apr 2000 HG
SPK - 0.564 ug
RESULT 0.869 ug
103 %

Seq: 88 18:32:26 19 Apr 2000 HG
<0.050 ug/L

Seq: 89 18:35:02 19 Apr 2000 HG
101 %

4/20/2000 Analytical Data

```
Protocol: SYSTEST   labsys2
                    Rev: 3.001    Time: 17:21:37  20 Apr 2000
Folder: 20APR00B    Seq: 59                     Print: On
User:               Batch:              Id: StdSRepl   Cup: 1 29 Gas:    0.23 LPM
State: Idle                                            Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 042000M
Cup Id          Extended id.          Weight Volume Macro check Help
16 47Q198                             1.0000 1.0000
17 47Q198 DUP                         1.0000 1.0000
18 Q126                               1.0000 1.0000
19 Q126 DUP                           1.0000 1.0000
20 Q127                               1.0000 1.0000
21 Q127 DUP                           1.0000 1.0000
22 Q128                               1.0000 1.0000
23 Q128 DUP                           1.0000 1.0000
24 1633B                              1.0000 1.0000
25 1633B DUP                          1.0000 1.0000
26 1633B TRIP                         1.0000 1.0000
27 47Q195                             1.0000 1.0000
28 47Q195 DUP                         1.0000 1.0000
29 47Q195 SPI                         1.0000 1.0000
30 CCV                                1.0000 1.0000
                                                                          PgDn
```

```
Cup 16 ID: 47Q198                                   Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 17:21:33  20 Apr 2000
Folder: 20APR00B   Seq: 59                      Print: On
User:              Batch:              Id: StdSRep1   Cup: 1.29 Gas:   0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 042000M
cup Id        Extended id.        Weight Volume Macro check Help
31 CCB                            1.0000 1.0000
32                                1.0000 1.0000
33                                1.0000 1.0000
34                                1.0000 1.0000
35                                1.0000 1.0000
36                                1.0000 1.0000
37                                1.0000 1.0000
38                                1.0000 1.0000
39                                1.0000 1.0000
40                                1.0000 1.0000
41                                1.0000 1.0000
42                                1.0000 1.0000
43                                1.0000 1.0000
44                                1.0000 1.0000
                                                                          PgDn

Cup 32 ID:                                   Cell entry, Ins to switch
```

*** Standard: 6 Rep: 1 Seq: 53 16:55:27 20 Apr 2000 HG

Hg 3.00 ug/L 300399

Ave. Int. = 300399 S. D. = 0

*** Standard: 1 Rep: 1 Seq: 54 16:58:07 20 Apr 2000 HG

Hg .000 ug/L -2013

Ave. Int. = -2013 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 55 17:00:24 20 Apr 2000 HG

Hg .050 ug/L 3378

Ave. Int. = 3378 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 56 17:02:41 20 Apr 2000 HG

Hg .200 ug/L 18030

Ave. Int. = 18030 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 57 17:05:00 20 Apr 2000 HG

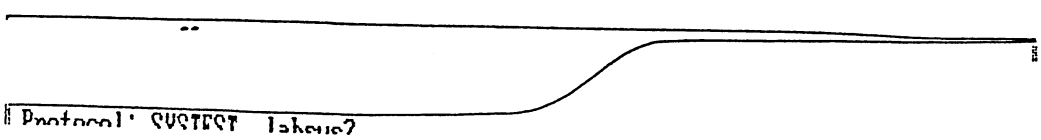
Hg 1.00 ug/L 102498

Ave. Int. = 102498 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 58 17:07:22 20 Apr 2000 HG

Hg 2.00 ug/L 200531

Ave. Int. = 200531 S. D. = 0



Rev: 3.001 Time: 17:11:39 20 Apr 2000

Folder: 20APR00B Seq: 59 Print: On

User: Batch: Id: Std5Rep1 Cup: 1 29 Gas: 0.23 LPM

State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

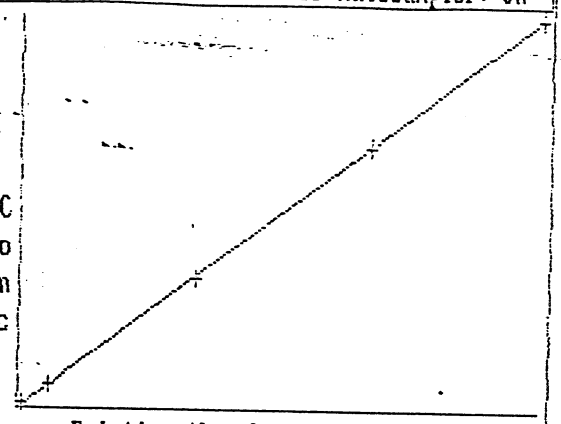
	Conc.	Calc.	Dev.	Accepted LiNear
S1	.000	-.007	-.007	Quadratic
S2	.050	.046	-.004	WtdLinear
S3	.200	.191	-.009	
S4	1.00	1.03	.029	Accept
S5	2.00	2.00	.000	
S6	3.00	2.99	-.010	StdAdd

Conc

A .0000000 r .999930

B 9.91240e-6 C 1.27214e-2

	Mean	%RSD	
S1	-2013	0	-2013
S2	3378	0	3378
S3	18830	0	18830
S4	102498	0	102498
S5	200531	0	200531
S6	300399	0	300399



Relative Absorbance

New calibration coefficients stored

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

*** Check Standard: 2 Ck2 Seq: 59 20:52:50 20 Apr 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	.603	.600	ug/L	.000

*** Sample ID: ICB Seq: 60 20:55:08 20 Apr 2000 HG

Hg .010 ug/L .000 .010 <0.050 ug/L

*** Sample ID: BLANK Seq: 61 20:57:21 20 Apr 2000 HG

Hg .028 ug/L .000 .028 <0.050 ug/L

*** Sample ID: BLANK DUP Seq: 62 20:59:34 20 Apr 2000 HG

Hg .034 ug/L .000 .034 <0.050 ug/L

*** Sample ID: 47Q190 Seq: 63 21:01:47 20 Apr 2000 HG

Hg .124 ug/L .000 .124 0.0062 ug

*** Sample ID: 47Q190 DUP Seq: 64 21:07:17 20 Apr 2000 HG RPD - 4.5

Hg .118 ug/L .000 .118 0.0059 ug

*** Sample ID: 47Q191 Seq: 65 21:09:30 20 Apr 2000 HG

Hg .151 ug/L .000 .151 0.0076 ug

*** Sample ID: 47Q191 DUP Seq: 66 21:12:08 20 Apr 2000 HG RPD 1.3

Hg .153 ug/L .000 .153 0.0077 ug

*** Sample ID: FILTER Seq: 67 21:14:21 20 Apr 2000 HG

Hg .178 ug/L .000 .178 0.0089 ug

*** Sample ID: FILT DUP Seq: 68 21:17:29 20 Apr 2000 HG RPD 4.0

Hg .171 ug/L .000 .171 0.0086 ug

*** Sample ID: 47Q193 Seq: 69 21:19:42 20 Apr 2000 HG

Hg .124 ug/L .000 .124 0.0062 ug

*** Sample ID: 47Q193 DUP Seq: 70 21:22:27 20 Apr 2000 HG RPD 4.1

Hg .119 ug/L .000 .119 0.0060 ug

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 47Q193 TRI					Seq: 71	21:25:07 20 Apr 2000 HG RPD - 4		
Hg	.130	ug/L	.000	.130		0.0065 ug		
*** Sample ID: 47Q194					Seq: 72	21:27:20 20 Apr 2000 HG		
Hg	.077	ug/L	.000	.077		0.0039 ug		
*** Sample ID: 47Q194 DUP					Seq: 73	21:29:33 20 Apr 2000 HG RPD 8		
Hg	.084	ug/L	.000	.084		0.0042 ug		
*** Sample ID: 47Q194 SPI					Seq: 74	21:31:46 20 Apr 2000 HG		
Hg	1.11	ug/L	.000	1.11	SPK 0.0500 REC 0.0555	103 %		
*** Sample ID: 47Q198					Seq: 75	21:34:04 20 Apr 2000 HG		
Hg	.078	ug/L	.000	.078		REPEAT		
*** Sample ID: 47Q198 DUP					Seq: 76	21:42:38 20 Apr 2000 HG		
Hg	.087	ug/L	.000	.087				
*** Sample ID: 47Q198					Seq: 77	21:46:29 20 Apr 2000 HG		
Hg	.084	ug/L	.000	.084		0.0042 ug		
*** Sample ID: 47Q198 DUP					Seq: 78	21:48:42 20 Apr 2000 HG RPD 5		
Hg	.089	ug/L	.000	.089		0.0045 ug		
*** Sample ID: Q126					Seq: 79	21:50:55 20 Apr 2000 HG		
Hg	1.44	ug/L	.000	1.44		2.38 ~~28.3~~ ug		
*** Sample ID: Q126 DUP					Seq: 80	21:57:55 20 Apr 2000 HG RPD <1.0		
Hg	1.44	ug/L	.000	1.44		2.38 ~~28.3~~ ug		
*** Sample ID: CCV					Seq: 81	22:03:36 20 Apr 2000 HG		
Hg	1.94	ug/L	.000	1.94		97 %		
*** Sample ID: CCB					Seq: 82	22:06:04 20 Apr 2000 HG		
Hg	.003	ug/L	.000	.003		<0.050 ug/L		

22:08:18 20 Apr 2000 Folder: 20APR00B Page 44
Protocol: SYSTEST labsys2

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Q127					Seq: 83	22:08:18 20 Apr 2000 HG		
Hg	1.17	ug/L	.000	1.17		1.95 ug		
*** Sample ID: Q127 DUP					Seq: 84	22:10:41 20 Apr 2000 HG RPD - <		
Hg	1.17	ug/L	.000	1.17		1.95 ug		
*** Sample ID: Q128					Seq: 85	22:13:00 20 Apr 2000 HG		
Hg	2.16	ug/L	.000	2.16		2.74 ug		
*** Sample ID: Q128 DUP					Seq: 86	22:15:25 20 Apr 2000 HG RPD - <		
Hg	2.15	ug/L	.000	2.15		2.73 ug		
*** Sample ID: 1633B					Seq: 87	22:17:50 20 Apr 2000 HG		
Hg	1.52	ug/L	.000	1.52	TV = 0.141 ug/g ± 0.014 ug/g	0.141 ug/g		
*** Sample ID: 1633B DUP					Seq: 88	22:20:12 20 Apr 2000 HG RPD - <		
Hg	1.51	ug/L	.000	1.51		0.140 ug/g		
*** Sample ID: 1633B TRIP					Seq: 89	22:22:39 20 Apr 2000 HG RPD - 2.9		
Hg	1.48	ug/L	.000	1.48		0.137 ug/g		
*** Sample ID: 47Q195					Seq: 90	22:25:06 20 Apr 2000 HG		
Hg	.023	ug/L	.000	.023		REPEAT		
*** Sample ID: 47Q195 DUP					Seq: 91	22:27:20 20 Apr 2000 HG		
Hg	.033	ug/L	.000	.033				
*** Sample ID: 47Q195 SPI					Seq: 92	22:29:34 20 Apr 2000 HG		
Hg	1.15	ug/L	.000	1.15				
*** Sample ID: 47Q195					Seq: 93	22:31:59 20 Apr 2000 HG		
Hg	.033	ug/L	.000	.033		<0.0025 ug		
*** Sample ID: 47Q195 DUP					Seq: 94	22:34:13 20 Apr 2000 HG RPD - <		
Hg	.012	ug/L	.000	.012		<0.0025 ug		

22:36:27 20 Apr 2000 Folder: 20APR00B Page 4

Protocol: SYSTEST labsys2

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 47Q195 SPI					Seq: 95	22:36:27 20 Apr 2000 HG		
Hg	1.06	ug/L	.000	1.06	SPIKE 0.053 ug RES. 0.050 ug			106%
*** Sample ID: CCV					Seq: 96	22:38:51 20 Apr 2000 HG		
Hg	1.95	ug/L	.000	1.95				98%
*** Sample ID: CCB					Seq: 97	22:41:24 20 Apr 2000 HG		
Hg	.003	ug/L	.000	.003				<0.050 ug/L

4/26/2000 Analytical Data

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 08:54:25  26 Apr 2000
Folder: 25APR00B   Seq: 71                      Print: On
User:              Batch:                 Id: Std&Rep1   Cup: 1 27 Gas:    0.30 LPM
State: Idle                                               Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry    Rack 042600A
Cup Id          Extended id          Weight Volume Macro check Help
 1 ICB                                1.0000 1.0000
 2 BLANK                              1.0000 1.0000
 3 BLANK DUP                          1.0000 1.0000
 4 1630a                              1.0000 1.0000
 5 1630a DUP                          1.0000 1.0000
 6 1399815                            1.0000 1.0000
 7 1399815DUP                         1.0000 1.0000
 8 1399816                            1.0000 1.0000
 9 1399816DUP                         1.0000 1.0000
10 1399816TRP                         1.0000 1.0000
11 1399817                            1.0000 1.0000
12 1399817DUP                         1.0000 1.0000
13 1399817SPK   1:2                   1.0000 1.0000
14 CCB                                1.0000 1.0000
15 CCV                                1.0000 1.0000
                                                                          PgDn
Cup 1   ID: ICB                                   Cell entry, Ins to switch
```

*** Standard: 1 Rep: 1 Seq: 65 08:25:07 26 Apr 2000 HG

Hg .000 ppb -828

Ave. Int. = -828 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 66 08:27:24 26 Apr 2000 HG

Hg .200 ppb 12022

Ave. Int. = 12022 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 67 08:29:42 26 Apr 2000 HG

Hg .500 ppb 25792

Ave. Int. = 25792 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 68 08:32:00 26 Apr 2000 HG

Hg 1.00 ppb 66410

Ave. Int. = 66410 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 69 08:34:18 26 Apr 2000 HG

Hg 2.00 ppb 130711

Ave. Int. = 130711 S. D. = 0

08:36:38 26 Apr 2000 Folder: 25APR00B Page 56

Protocol: SYSTEST labsys2

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

*** Standard: 6 Rep: 1 Seq: 70 08:36:38 26 Apr 2000 HG

Hg 3.00 ppb 196512

Ave. Int. = 196512 S. D. = 0

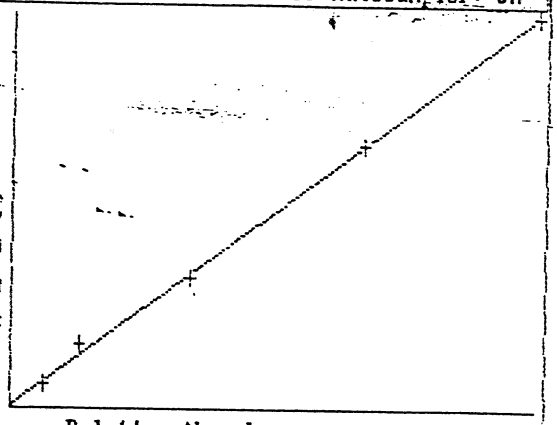
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 08:47:45 26 Apr 2000
Folder: 25APR00B Seq: 71 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 27 Gas: 0.30 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted
S1	.000	.024	.024	LiNear
S2	.200	.217	.017	Quadratic
S3	.500	.425	-.075	WtdLinear
S4	1.00	1.04	.036	Accept
S5	2.00	2.00	.004	
S6	3.00	2.99	-.006	StdAdd

A .0000000 r .999420
m 1.58515e-5 C 3.64218e-2



	Mean	%RSD	
S1	-828	0	-828
S2	12022	0	12022
S3	25792	0	25792
S4	66410	0	66410
S5	130711	0	130711
S6	196512	0	196512

New calibration coefficients stored

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

*** Check Standard: 2 Ck2 Seq: 71 08:56:05 26 Apr 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		104.	.624	.600	ppb	.000

*** Sample ID: ICB Seq: 72 09:02:06 26 Apr 2000 HG

Hg .034 ppb .000 .034 <0.20 ug/L

*** Sample ID: BLANK Seq: 73 09:04:19 26 Apr 2000 HG

Hg .144 ppb .000 .144 <0.20 ug/L

*** Sample ID: BLANK DUP Seq: 74 09:06:32 26 Apr 2000 HG

Hg .155 ppb .000 .155 <0.20 ug/L

*** Sample ID: 1630a Seq: 75 09:08:45 26 Apr 2000 HG

Hg 2.21 ppb .000 2.21 REPEAT

*** Sample ID: ICB Seq: 76 09:41:33 26 Apr 2000 HG

Hg .030 ppb .000 .030 <0.20 ug/L

*** Sample ID: BLANK Seq: 77 09:43:46 26 Apr 2000 HG

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

*** Sample ID: BLANK DUP Seq: 78 09:45:59 26 Apr 2000 HG

Hg .090 ppb .000 .090 <0.20 ug/L

*** Sample ID: 1630a Seq: 79 09:48:12 26 Apr 2000 HG

Hg 1.51 ppb .000 1.51 TV: 0.106 ug/g 0.138 ug/g 0.075 ug/g
LIMITS 0.074 ug/g - ~~1.38~~ ug/g - INVALID

*** Sample ID: 1630a DUP Seq: 80 09:50:27 26 Apr 2000 HG RPD <1.0

Hg 1.51 ppb .000 1.51 0.075 ug/g

*** Sample ID: 1399815 Seq: 81 09:58:55 26 Apr 2000 HG

Hg 2.12 ppb .000 2.12 0.117 ug/g

*** Sample ID: 1399815DUP Seq: 82 10:01:08 26 Apr 2000 HG RPD <1.0

Hg 2.10 ppb .000 2.10 0.116 ug/g

10:03:31 26 Apr 2000 Folder: 25APR00B Page 52
Protocol: SYSTEST labsys2

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1399816					Seq: 83	10:03:31 26 Apr 2000 HG		
Hg	2.09	ppb	.000	2.09				
*** Sample ID: 1399816DUP					Seq: 84	10:05:44 26 Apr 2000 HG		
Hg	2.09	ppb	.000	2.09				
*** Sample ID: 1399816TRP					Seq: 85	10:07:59 26 Apr 2000 HG		
Hg	2.10	ppb	.000	2.10				
*** Sample ID: 1399817					Seq: 86	10:10:14 26 Apr 2000 HG		
Hg	2.28	ppb	.000	2.28				
*** Sample ID: 1399817DUP					Seq: 87	10:12:32 26 Apr 2000 HG		
Hg	2.31	ppb	.000	2.31				
*** Sample ID: 1399817SPK					Seq: 88	10:14:47 26 Apr 2000 HG		
Hg	3.40	ppb	.000	3.40				
*** Sample ID: 1399817SPK					Seq: 89	10:23:25 26 Apr 2000 HG		
Hg	1.79	ppb	.000	1.79				
*** Sample ID: CCB					Seq: 90	10:25:38 26 Apr 2000 HG		
Hg	.031	ppb	.000	.031				
*** Sample ID: CCV					Seq: 91	10:27:51 26 Apr 2000 HG		
Hg	2.05	ppb	.000	2.05				

0.115 ug/g

0.115 ug/g RPD <1.0

0.115 ug/g

0.123 ug/g

RPD 2.1%

0.125 ug/g

REPEAT.

SPK 0.050 ug/g
RESULT 0.179 ug/g
112%

<0.20 ug/L

103%

ry Weight/Total Volatile Solids (TVS) Notebook # 2000-033

ımple Number	139815	139816	139817			
lient/Pan #	A TEST 1	B TEST 2	C TEST 3			
Vt of Pan + ample	18.1890	18.4510	15.0636			
Vt after Drying (1)	16.4797	16.8343	13.9622			
Vt after Drying (2)	16.4846	16.8402	13.9671			
Vt after Drying (3)	16.4910	16.8458	13.9703			
Wt of Pan or Wt After Ignition	0.9862	0.9887	0.9924			
Difference	15.4935	15.8456	12.9698			
Sample amount g	17.2028	17.4623	14.0712			
Result	90.1 %	90.7 %	92.2 %			

Sample Number						
Client/Pan #						
Wt of Pan + Sample						
Wt after Drying (1)						
Wt after Drying (2)						
Wt after Drying (3)						
Wt of Pan or Wt After Ignition						
Difference						
Sample amount g						
Result						

Sample Number					Batch Number:
Client/Pan #					Notes: METALS METOD ENV.
Wt of Pan + Sample					
Wt after Drying (1)					
Wt after Drying (2)					
Wt after Drying (3)					
Wt of Pan or Wt After Ignition					*The sample should be weighed at least twice to a constant weight. If necessary weigh a third time. Use final weighing for calculation. Criteria 0.5mg or 4%. Each additional weighing is 1 hour.*
Difference					
Sample amount g					
Result					

PC 1.5

Analyst: PXP Date: 4/25/00

TestAmerica INCORPORATED

Sample Train Receipt Records

Mercury Sample Train Receipt Record

Client ID
Cinergy - Gibson Station
Owensville, IN

99-95-GIB3A

Location ID/Run #
Unit 3 Stack
RUN 4

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	27 + — + — = 27.	S4-2	
3 (2)	430 + 360 + — = 790.	S4-3 A&B	
4 (1)	170 + — + — = 170.	S4-4	
5 (1)	510 + — + — = 510.	S4-5	**
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A ( )	"Filter"	S4-1A	*
1B ( )			
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: * No filter number ~~was~~ was given.
** No run number listed on bottle. All other container 5's accounted for, so assumption was made that it belonged to Run 4.

Checked By: EPK
Date: 4/13/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
Cinergy - Gibson Station
Owensville, IN

99-95GIB3A

Location ID/Run #
Unit 3 Stack
RUN 3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	136 + — + — = 136.	S3-2	
3 (2)	460 + 350 + — = 810.	S3-3 A&B	
4 (1)	170 + — + — = 170.	S3-4	
5 (1)	495 + — + — = 490.	S3-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	#47Q191	S3-1A	
1B ( )			
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EDK
Date: 4/13/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - Cinergy
Owensville, IN

99-95 GIB3A

Location ID/Run #
Unit 3 Stack
RUN 2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	123 + — + — = 123.	S2-2	
3 (2)	420 + 350 + — = 770.	S2-3 A+B	
4 (1)	160 + — + — = 160.	S2-4	
5 (1)	460 + — + — = 460.	S2-5	
7 ( )	— + — + — = —.		
8 ( )	— + — + — = —.		
9 ( )	— + — + — = —.		
10 ( )	— + — + — = —.		
11 ( )	— + — + — = —.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)		S2-1A	
1B ( )			
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica

Mercury Sample Train Receipt Record

Client ID
EPRI - Cinergy
Owensville, IN

99-95 GIB3A

Location ID/Run #
Unit 3 Precipitation Inlet Duct
BLANK TRAIN

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 ( )	___ + ___ + ___ = ___.		
3 (1)	490 + — + — = 490.	IBT-3	
4 (1)	165 + — + — = 165.	IBT-4	
5 (1)	490 + — + — = 490.	IBT-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

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

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
Cinergy - Gibson Station
Owensville, IN

99-95 GIB3A

Location ID/Run #
Unit 3 Precipitation Inlet Duct
RUN 4

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	97 + — + — = 97.	I4-2	
3 (2)	400 + 370 + — = 770.	I4-3 A&B	
4 (1)	150 + — + — = 150.	I4-4	
5 (1)	490 + — + — = 490.	I4-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q 128	I4-1A	
1B (1)	47Q198	I4-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica

Mercury Sample Train Receipt Record

Client ID
Cinergy-Gibson Station
Owensville, IN

99-95 GIB3A

Location ID/Run #
Unit 3 Precipitation Inlet Duct
RUN 3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	79 + — + — = 79.	I3-2	
3 (2)	410 + 380 + — = 790.	I3-3 A&B	
4 (1)	165 + — + — = 165.	I3-4	
5 (1)	505 + — + — = 505.	I3-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)	TestAmerica ID(s)	Comments
1A (1)	Q127	I3-1A	
1B (1)	47Q194	I3-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica

Mercury Sample Train Receipt Record

Client ID
EPRI - Cinergy
Owensville, IN

99-95 GIB3A

Location ID/Run #
Unit 3 Precipitation Inlet Duct
RUN 2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	80 + — + — = 80.	I2-2	
3 (2)	410 + 380 + — = 790.	I2-3 A+B	
4 (1)	185 + — + — = 185.	I2-4	
5 (1)	470 + — + — = 470.	I2-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)	TestAmerica ID(s)	Comments
1A (1)		I2-1A	
1B (1)		I2-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica

Mercury Sample Train Receipt Record

Client ID
EPRI - ~~G~~ Cinergy
Owensville, IN

99-95GIB3A

Location ID/Run #
Unit 3 Precipitation Inlet Duct
REAGENT BLANKS

Solutions:

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

Filters:

Cont. ID/(#)	Filter ID(s)		
1A ( )			
1B ( )			
12	47Q 195, 196, 197 (47 mm)		
	(88 mm)		
	Q 111, 115, 119 (Thimble)		

Notes:

Checked By: EPK
Date: 4/13/00

TestAmerica

Dry Weight Analysis Records

ry Weight/Total Volatile Solids (TVS) Notebook # 2000-033

ample Number	139815	139816	139817			
lient/Pan #	A TEST 1	B TEST 2	C TEST 3			
Vt of Pan + ample	18.1890	18.4510	15.0636			
Vt after Drying (1)	16.4797	16.8343	13.9622			
Vt after Drying (2)	16.4846	16.8402	13.9671			
Vt after Drying (3)	16.4910	16.8458	13.9703			
Wt of Pan or Wt After Ignition	0.9862	0.9887	0.9924			
Difference	15.4935	15.8456	12.9698			
Sample amount g	17.2028	17.4623	14.0712			
Result	90.1 %	90.7 %	92.2 %			

Sample Number						
Client/Pan #						
Wt of Pan + Sample						
Wt after Drying (1)						
Wt after Drying (2)						
Wt after Drying (3)						
Wt of Pan or Wt After Ignition						
Difference						
Sample amount g						
Result						

Sample Number					Batch Number:
Client/Pan #					Notes: METALS METOD ENV.
Wt of Pan + Sample					
Wt after Drying (1)					
Wt after Drying (2)					
Wt after Drying (3)					
Wt of Pan or Wt After Ignition					
Difference					
Sample amount g					
Result					

The sample should be weighed at least twice to a constant weight. If necessary weigh a third time. Use final weighing for calculation. Criteria 0.5mg or 4%. Each additional weighing is 1 hour.

PC 1.5

Analyst: PXP Date: 4/25/00

TestAmerica INCORPORATED

METCO Particulate Analysis

METCO Environmental

Particulate Analysis EPA Method 17

Thimbles and Backup Filters

Job Number 99-95 G1B3A

Job Name Cincrgy

Location Clebourne, Ia.

Unit Tested Unit 3 Stack

Desiccator Time In	1630 3/31				
Desiccator Time Out	900 - 4/3	1105 4/4			

Run No. 1 Thimble No. 1 Filter No. 470190

Thimble Final Weight (g)					
Thimble Initial Weight (g)					
Particulate (g)					
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1613	0.1609	✓		

Filter and Particulate Average (g) 0.1611

Initial Filter Weight (g) 0.1154

Filter Particulate Average (mg) 45.7

Thimble Particulate Average (mg)

Total Particulate (mg) 45.7

Run No. Thimble No. Filter No. 470191

Thimble Final Weight (g)					
Thimble Initial Weight (g)					
Particulate (g)					
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1656	0.1651	✓		

Filter and Particulate Average (g) 0.1654

Initial Filter Weight (g) 0.1166

Filter Particulate Average (mg) 48.8

Thimble Particulate Average (mg)

Total Particulate (mg) 48.8

Run No. 4 Thimble No. Filter No. 470199

Thimble Final Weight (g)					
Thimble Initial Weight (g)					
Particulate (g)					
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1634	0.1629	✓		

Filter and Particulate Average (g) 0.1632

Initial Filter Weight (g) 0.1170

Filter Particulate Average (mg) 46.2

Thimble Particulate Average (mg)

Total Particulate (mg) 46.2

Analyst

METCO Environmental

Particulate Analysis EPA Method 17

Thimbles and Backup Filters

Job Number 99-95 GIE 3A

Job Name Cinergy

Location Owensville, Ind.

Unit Tested #3 Precip. Outlet

Desiccator Time In	1630 3/31					
Desiccator Time Out	847 4/3	1100 4/4				

Run No. 2 Thimble No. Q126 Filter No. 47Q193

Thimble Final Weight (g)	22.7059	22.7968	✓		
Thimble Initial Weight (g)	3.1378	3.1378			
Particulate (g)	19.6581	19.6590			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1130	0.1129	✓		

Filter and Particulate Average (g) 0.1130

Initial Filter Weight (g) 0.1162

Filter Particulate Average (mg) 0

Thimble Particulate Average (mg) 19,658.6

Total Particulate (mg) 19,658.6

Run No. 3 Thimble No. Q127 Filter No. 47Q194

Thimble Final Weight (g)	20.2475	20.2480	✓		
Thimble Initial Weight (g)	3.1610	3.1610			
Particulate (g)	17.0865	17.0870			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1116	0.1115	✓		

Filter and Particulate Average (g) 0.1116

Initial Filter Weight (g) 0.1157

Filter Particulate Average (mg) 0

Thimble Particulate Average (mg) 17,086.8

Total Particulate (mg) 17,086.8

Run No. 4 Thimble No. Q128 Filter No. 47Q198

Thimble Final Weight (g)	17.2243	17.2267	✓		
Thimble Initial Weight (g)	3.1203	3.1203			
Particulate (g)	14.1040	14.1064			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1116	0.1114	✓		

Filter and Particulate Average (g) 0.1115

Initial Filter Weight (g) 0.1155

Filter Particulate Average (mg) 0

Thimble Particulate Average (mg) 14,105.2

Total Particulate (mg) 14,105.2

Analyst

 26APR00_1836_04_N1089_RFR

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

ANALYTICAL REPORT

Client: METCO Environmental

Report to: Bill Hefley
METCO Environmental
P. O. Box 598
Addison TX 75001

Project: 192204
Received: 14-APR-00
Reported: 26-APR-00

Project Description: Coal Composite and Analysis

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Test 1						
Lab Sample: 1399815						
Moisture, Total	7.38		%	D 3302	18-APR-00	GLB
Chlorine, Total	0.15	0.17	%	EPA 300.0	24-APR-00	DRK
SHORT PROX - COAL						
Ash	11.3	12.2	%	D 3174	20-APR-00	VJO
Sulfur	1.34	1.45	%	D 4239	24-APR-00	VJO
Heating Value	10780	11640	BTU/lb	D 3286	24-APR-00	GLB
Test 2						
Lab Sample: 1399816						
Moisture, Total	7.81		%	D 3302	18-APR-00	GLB
Chlorine, Total	0.15	0.17	%	EPA 300.0	24-APR-00	DRK
SHORT PROX - COAL						
Ash	11.9	12.9	%	D 3174	20-APR-00	VJO
Sulfur	1.34	1.45	%	D 4239	24-APR-00	VJO
Heating Value	10720	11630	BTU/lb	D 3286	24-APR-00	GLB
Test 3						
Lab Sample: 1399817						
Moisture, Total	8.19		%	D 3302	18-APR-00	GLB
Chlorine, Total	0.20	0.22	%	EPA 300.0	24-APR-00	DRK
SHORT PROX - COAL						
Ash	12.8	13.9	%	D 3174	20-APR-00	VJO
Sulfur	1.44	1.57	%	D 4239	24-APR-00	VJO

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-6833 FAX 610-921-9667

PHILIP ANALYTICAL SERVICES

 26APR00_1836_D4_N1089_RFR

INDUSTRIAL HYGIENE

• EPA/NVLAP 101262-0
• AIHA ACCREDITATION NO. 100439

ENVIRONMENTAL TESTING

• NY DOH 10903
• PA DEH 06-353
• NJ DEP 77678

Client: METCO Environmental
Project: 192204

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Test 3						
Lab Sample: 1399817 - continued						
Heating Value	10610	11550	BTU/lb	D 3286	24-APR-00	VJO

< Indicates less than the limit of quantitation.

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-6833 FAX 610-921-9667

APPENDIX E

Unit Operational Data

Gibson Station - Unit 3						
	Mercury Flue Gas Sampling					
				Date:	3/29/00	
Process Data						
Time	Load (Mw)	Steam Flow (klb/h)	Mills in Service	Coal Flow (klb/h)	Coal Flow (tph)	Furnace Exit Gas Temp (F)
Run 1						
1015	662	4552.2	6	596.1	298.05	784.2
1030	661	4499.2	6	595.7	297.85	781.9
1045	661	4545.2	6	590.3	295.15	782
1100	659	4535.5	6	581.8	290.9	781.3
1115	659	4594.6	6	594	297	783.4
1130	664	4624.1	6	595.1	297.55	785.6
1145	663	4622.4	6	590.6	295.3	787.4
1200	663	4583.9	6	593.9	296.95	787.8
1215	660	4617.8	6	596.4	298.2	790.6
1230	663	4568.6	6	589.9	294.95	787.2
1245	662	4564.3	6	582.4	291.2	786.1
1300	663	4559.5	6	581.2	290.6	784
Average	661.6667	4572.275	6	590.6167	295.3083	785.125
Run 2					0	
1345	664	4567.1	6	582.2	291.1	782.8
1400	659	4555.6	6	590.1	295.05	785
1415	660	4565.5	6	591.7	295.85	786.8
1430	663	4571.6	6	586	293	784.6
1445	662	4588.7	6	583.9	291.95	783
1500	660	4605.9	6	562.6	281.3	784.7
1515	662	4600.7	6	589.4	294.7	786.9
1530	660	4600.7	5	582.4	291.2	787.4
1545	660	4536.7	5	566.5	283.25	787
1600	653	4482.8	5	565	282.5	786.5
1615	648	4427.4	5	565	282.5	785.5
1630	648	4426.9	5	542.6	271.3	784.2
					0	
					0	
Average	658.25	4544.133	5.583333	575.6167	246.6929	785.3667
Run 3					0	
1710	651	4418.4	5	559.2	279.6	783.4
1725	642	4450.2	5	561.7	280.85	783.9
1810	633	4368.3	5	542.9	271.45	781.9
1825	638	4378	5	550.6	275.3	781.7
1840	636	4335.8	5	556.6	278.3	781.9
1855	633	4404.2	5	544.7	272.35	783.5
1910	636	4404	5	549.9	274.95	781.9
1925	637	4393.9	5	567	283.5	781.1
1940	636	4391.7	5	556.3	278.15	779.8
1955	639	4371.3	5	562.9	281.45	779.2
2010	639	4427.3	5	540.4	270.2	780.8
2025	634	4369.7	5	556.7	278.35	782.3
Average	637.8333	4392.733	5	554.075	255.7269	781.7833
					0	
					0	

Gibson Station - Unit 3						
	Mercury Flue Gas Sampling					
				Date:	3/29/00	
Precipitator Data						
Time	Power Input (kVA)	Fields Out of Service	Duct Opacity (%)	Gas Inlet Temp. A (F)	Gas Inlet Temp. B (F)	Gas Outlet Temp (F)
Run 1						
1015			18.9	329	305	270.5
1030			18.8	329	305	271.8
1045			20.6	334	307	272.6
1100			20.8	334	307	276.2
1115			19.6	333	307	276.2
1130			20.4	331	305	276.6
1145			17.8	332	305	276.3
1200			18.5	329	305	274.6
1215			17	330	304	274.1
1230			16.6	330	306	273.1
1245			16.2	331	307	273.6
1300			16.3	331	306	274.2
Average			18.45833	331.0833	305.75	274.15
Run 2						
1345			16.3	332	307	274.8
1400			16.9	331	308	275.1
1415			17.1	331	307	275.9
1430			17.2	332	312	277.6
1445			18	336	312	280
1500			22.1	337	311	282
1515			19	332	306	281.3
1530			18.3	331	305	280.1
1545			18	331	306	278.6
1600			18	331	306	278.5
1615			17	331	305	277.3
1630			16.5	330	306	278.3
			17.86667	332.0833	307.5833	278.2917
Run 3						
1710			16.6	330	304	277.3
1725			16.3	331	304	277.3
1810			16	328	303	275.3
1825			15.1	329	304	275.3
1840			14.9	329	305	275.8
1855			15.8	329	304	276.1
1910			14.9	329	303	276.4
1925			15.3	329	303	276.3
1940			14.7	327	302	273.7
1955			13.9	325	301	273.7
2010			14	326	301	273.1
2025			13.4	326	301	273
Average			15.075	328.1667	302.9167	275.275

Gibson Station - Unit 3					
	Mercury Flue Gas Sampling				
				Date:	3/29/00
CEM Data					
Time	CO2 (wet)	SO2 (lb/mmBtu)	NOx (lb/mmBtu)	Opacity (%)	Flow (scf/h)
Run 1					
1015	9.6	2.34	0.533	19.7	126564039
1030	9.6	2.35	0.52	19.3	127984180
1045	9.5	2.38	0.508	20.9	126339287
1100	9.4	2.4	0.512	20.6	127351866
1115	9.5	2.37	0.511	19.4	127030006
1130	9.5	2.35	0.52	20.3	128010209
1145	9.5	2.38	0.519	18.5	125479191
1200	9.3	2.39	0.517	18.4	126443855
1215	9.2	2.3	0.511	17.5	126909997
1230	9.4	2.28	0.513	16.9	124763271
1245	9.4	2.31	0.523	16.4	125913178
1300	9.4	2.32	0.52	17.1	125474001
Aveage	9.4416667	2.3475	0.51725	18.75	126521923
Run 2					
1345	9.4	2.37	0.506	16.8	124950213
1400	9.5	2.34	0.49	17	123825400
1415	9.5	2.34	0.499	17.1	125784752
1430	9.5	2.37	0.507	17.1	127006851
1445	9.4	2.38	0.53	17.5	126623824
1500	9.4	2.36	0.497	21.2	127788215
1515	9.4	2.37	0.461	18.4	127752566
1530	9.4	2.37	0.458	17.7	127787270
1545	9.4	2.37	0.46	17.4	126109156
1600	9.2	2.37	0.464	17.6	126437775
1615	9	2.29	0.464	16.6	124606031
1630	9.2	2.25	0.461	16.9	125101429
Average	9.3583333	2.3483333	0.4830833	17.60833	126147790
Run 3					
1710	9.3	2.22	0.477	19.4	127683213
1725	9.3	2.23	0.48	18.2	124754413
1810	9.2	2.21	0.47	17.1	124192824
1825	9.3	2.19	0.47	15.4	125261101
1840	9.3	2.2	0.474	15.7	125306721
1855	9.3	2.2	0.47	15.8	125094586
1910	9.3	2.2	0.474	15.4	125603205
1925	9.2	2.21	0.476	14.8	125069063
1940	9.2	2.21	0.476	15.9	125069063
1955	9.3	2.19	0.479	14.8	124117725
2010	9	2.15	0.467	14.9	123149955
2025	9.2	2.12	0.468	14.4	122986639
Average	9.2416667	2.1941667	0.4734167	15.98333	124857376

Date:
Unit:

Gibson Precipitator Data

Run #	1 - 1015																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	11	52	60	103	27	99	36	136	58	167	90	143	102	156	117	128
	Pri Volts	96	247	390	300	232	355	314	403	336	405	326	355	352	372	326	343
	Prec mAmps	35	294	413	518	105	560	210	777	308	889	588	1060	721	1080	637	833
	Sparks	S						S	S							S	
	N/S GND																
B	Pri Amps	120	20	138	125	144	79	108		115	118	166	112	167	164	167	149
	Pri Volts	316	93	348	333	400	343	369		393	357	350	312	360	400	367	348
	Prec mAmps	742	133	875	784	910	420	595		336	735	1070	588	1070	1080	1140	1020
	Sparks	S	S	A	S										CL	U	FC
	N/S GND								GND								

Run #	1 - 1045																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	8	18	90	13	62	77	31	74	54	99	73	140	71	162	98	128
	Pri Volts	98	148	340	139	333	331	288	321	336	324	292	355	292	374	309	340
	Prec mAmps	35	70	427	56	301	539	175	581	308	770	420	1020	651	1080	707	861
	Sparks						A			S							
	N/S GND																
B	Pri Amps	164	29	158	103	160	83	106		114	118	167	141	168	167	166	152
	Pri Volts	355	120	362	307	333	348	374		396	352	348	350	360	393	367	345
	Prec mAmps	826	133	987	707	616	434	889		707	742	1060	1070	1090	1100	1140	1040
	Sparks		s	CL	S	S											
	N/S GND								GND								

Run #	1 - 1115																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	4	481	86	81	54	90	39	119	59	150	96	142	99	144	124	128
	Pri Volts	69	240	343	272	326	333	304	379	340	381	340	355	333	355	338	343
	Prec mAmps	14	294	525	616	315	742	182	108	322	749	721	1060	756	1100	686	854
	Sparks					S	A		S		S	S	VL		S		
	N/S GND																
B	Pri Amps	120	20	109	87	130	76	115		135	118	167	99	167	166	167	147
	Pri Volts	304	110	302	290	379	345	374		432	355	350	312	357	405	364	345
	Prec mAmps	651	105	686	686	861	406	882		819	742	1070	714	1070	1100	1140	1010
	Sparks		S								CL		S				
	N/S GND								GND								

Run #	1 - 1145																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	9	101	90	93	58	81	45	114	45	145	88	145	106	164	111	129
	Pri Volts	96	326	350	280	326	309	321	336	300	340	326	357	348	374	316	343
	Prec mAmps	28	753	441	581	322	672	203	707	273	882	637	1050	490	1000	840	826
	Sparks		S	S		S		S	S	S							
	N/S GND																
B	Pri Amps	75	25	144	117	144	76	115		113	118	166	117	168	167	165	148
	Pri Volts	252	105	355	328	403	338	369		396	357	352	350	360	396	364	345
	Prec mAmps	490	126	777	812	875	399	882		714	742	1080	665	1070	1090	1130	1020
	Sparks				S	S	VL	S			CL		S				
	N/S GND								GND								

Run #	1 - 1215																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	9	39	70	41	42	94	36	99	55	149	72	144	111	166	120	128
	Pri Volts	100	213	314	211	307	343	200	355	331	376	295	355	340	379	343	345
	Prec mAmps	35	70	504	217	203	644	140	714	315	910	490	1060	735	1080	777	854
	Sparks						A							S			
	N/S GND																
B	Pri Amps	31	23	111	130	99	75	110		134	118	162	106	167	165	168	151
	Pri Volts	175	110	326	324	338	340	367		427	357	345	304	357	391	367	348
	Prec mAmps	161	133	868	686	665	420	868		749	742	1070	749	1070	1110	1130	1050
	Sparks		S	S									S	CL		CL	
	N/S GND								GND								

Run #	1 - 1245																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	6	23	70	91	65	94	30	92	43	152	89	144	101	141	101	127
	Pri Volts	86	182	319	300	302	101	276	362	319	309	324	355	304	360	300	343
	Prec mAmps	21	126	399	462	224	693	112	805	259	882	434	1050	539	1120	728	840
	Sparks			S	S	S	A	S		S				A		S	
	N/S GND																
B	Pri Amps	158	26	144	132	136	81	114		91	117	166	72	167	168	167	151
	Pri Volts	338	108	331	343	386	345	374		343	355	355	280	357	388	367	345
	Prec mAmps	1010	147	812	973	840	406	903		504	742	1070	525	1070	1100	1140	1030
	Sparks	S			S			VL		P							
	N/S GND								GND								

Run #	1 - 1315																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	8	86	81	106	58	101	26	70	57	115	104	138	72	154	113	125
	Pri Volts	93	312	336	295	331	355	254	328	336	367	352	352	316	367	311	340
	Prec mAmps	21	399	420	630	217	693	119	462	294	952	637		450	651	630	826
	Sparks				S				S		A	S		A			
	N/S GND																
B	Pri Amps	156	22	143	113	95	84	112		121	119	168	102	168	164	167	150
	Pri Volts	350	98	376	321	324	345	369		400	355	355	300	360	393	367	345
	Prec mAmps	812	105	1140	679	616	420	903		742	742	1070	770	1060	1100	1130	1020
	Sparks																
	N/S GND								GND								

Run #	2 - 1345																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	8	95	79	87	53	101	35	115	52	167	108	144	72	165	99	128
	Pri Volts	98	328	328	280	312	357	302	391	321	403	324	331	292	374	302	340
	Prec mAmps	28	630	476	658	203	679	154	408	287	1080	588	1010	406	1050	770	868
	Sparks		S	S	S	S										A	
	N/S GND																
B	Pri Amps	64	26	125	138	143	82	115		100	117	167	139	168	167	165	149
	Pri Volts	256	108	336	343	400	345	374		364	352	355	345	357	391	367	345
	Prec mAmps	406	140	973	861	707	420	644		574	742	1060	917	1070	1110	1130	1010
	Sparks	S		S									S				
	N/S GND								GND								

Run #	2 - 1415																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	9	23	64	32	55	77	33	110	49	161	100	141	100	140	111	128
	Pri Volts	100	177	297	192	319	309	292	381	312	400	328	355	309	372	341	340
	Prec mAmps	28	105	476	140	266	518	147	735	266	959	413	1020	602	763	651	854
	Sparks					S	A		S	S	S	S		A	A		
	N/S GND																
B	Pri Amps	71	21	110	103	65	81	114		86	118	165	116	168	166	167	151
	Pri Volts	247	98	328	326	278	345	369		343	355	355	300	357	388	367	348
	Prec mAmps	364	140	889	868	315	427	875		476	742	1070	700	1070	1100	1140	1030
	Sparks			S	S	S	VL						A				FL
	N/S GND								GND								

Run #	2 - 1445																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	4	60	92	106	43	99	43	80	48	120	75	141	98	162	131	128
	Pri Volts	69	271	350	292	292	358	312	338	331	369	326	355	340	376	324	343
	Prec mAmps	14	420	525	609	252	609	168	679	329	1000	616	1050	609	1120	945	854
	Sparks			S	S			S	S	S	CL	S				A	
	N/S GND																
B	Pri Amps	91	24	167	132	90	81	116		119	117	166	93	166	165	166	150
	Pri Volts	290	108	362	350	321	350	372		405	355	352	297	360	388	364	345
	Prec mAmps	875	140	1050	812	574	420	903		742	742	1070	861	1070	1110	1140	1020
	Sparks				S	S											
	N/S GND								GND								

Run #	2 - 1515																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	5	48	72	43	54	81	33	72	48	124	65	143	75	161	103	127
	Pri Volts	79	230	309	206	319	324	288	309	309	350	280	355	300	357	316	340
	Prec mAmps	21	238	336	189	224	665	154	413	266	791	357	1060	399	1110	798	861
	Sparks			S					S								
	N/S GND																
B	Pri Amps	44	27	113	127	48	83	94		122	118	130	100	167	168	167	150
	Pri Volts	220	110	312	326	254	305	345		405	357	314	292	360	391	367	350
	Prec mAmps	308	112	749	770	301	441	854		391	742	805	777	1070	1090	1140	1020
	Sparks			S	S								S		CL		FC
	N/S GND								GND								

Run #	2 - 1545																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	10	55	87	96	49	99	39	91	56	167	90	142	78	130	110	128
	Pri Volts	105	242	331	290	300	357	302	348	333	400	328	355	302	360	316	343
	Prec mAmps	28	315	532	700	273	679	133	462	231	1000	574	1060	581	1100	882	861
	Sparks				S			S	S		CL	S	VL				
	N/S GND																
B	Pri Amps	66	25	112	117	101	82	114		109	118	164	103	167	165	167	151
	Pri Volts	254	105	314	321	345	350	372		374	352	357	324	360	393	367	348
	Prec mAmps	560	154	602	742	665	441	868		602	742	1060	644	1070	1100	1140	1030
	Sparks					S	VL						S				
	N/S GND								GND								

Run #	2 - 1615																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	13	65	94	87	58	87	35	106	47	142	85	145	72	150	80	129
	Pri Volts	100	261	340	250	328	348	292	345	309	369	314	355	316	336	280	343
	Prec mAmps	42	364	581	504	266	490	168	539	315	931	420	1070	406	756	581	861
	Sparks	S						S	S	S	S	S			S		
	N/S GND																
B	Pri Amps	98	22	123	129	109	84	115		87	118	168	110	168	165	165	152
	Pri Volts	290	96	331	352	345	350	369		333	352	357	321	360	391	364	345
	Prec mAmps	840	112	805	910	497	441	902		420	742	1050	644	1070	1070	1140	1020
	Sparks	S	S							S			S	CL		CL	
	N/S GND								GND								

Run #	2 - 1635																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	9	88	82	120	58	104	44	97	53	104	106	145	69	164	104	128
	Pri Volts	96	321	340	307	321	360	319	350	338	343	350	355	309	331	319	343
	Prec mAmps	21	630	532	819	238	581	161	819	301	861	588	1070	504	917	630	833
	Sparks		S	S											A		
	N/S GND																
B	Pri Amps	110	27	140	135	72	86	116		129	118	163	130	167	166	167	151
	Pri Volts	288	112	350	331	285	352	372		417	350	355	328	360	403	367	345
	Prec mAmps	488	175	952	602	399	455	882		448	742	1070	1060	1070	1100	1130	1020
	Sparks			S		S	VL			VL			S				
	N/S GND								GND								

Run #	3 -1710																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	14	77	101	106	63	112	47	135	58	165	76	144	91	166	96	128
	Pri Volts	117	288	340	290	348	357	319	351	309	400	321	357	314	362	307	343
	Prec mAmps	42	553	553	632	329	721	238	840	252	1080	581	1070	518	1050	707	861
	Sparks		S		S	S	A	S	S	S	CL	A				S	
	N/S GND																
B	Pri Amps	77	26	130	152	130	87	110		82	119	167	108	167	167	167	150
	Pri Volts	249	110	350	348	316	350	367		336	350	360	307	360	388	367	345
	Prec mAmps	261	161	847	700	357	469	889		455	742	1070	812	1070	1110	1130	1020
	Sparks		S		S		A					CL	A		CL		
	N/S GND								GND								

Run #	3 - 1815																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	14	94	88	115	58	97	41	130	57	142	77	144	99	161	114	127
	Pri Volts	120	326	331	261	321	355	331	353	312	391	338	355	343	379	321	340
	Prec mAmps	56	602	609	420	322	651	224	784	301	966	602	1070	518	1090	896	861
	Sparks		S	S	S	S	A	S	S			S		A		S	CL
	N/S GND																
B	Pri Amps	91	27	110	147	73	85	116		134	118	166	67	167	165	167	151
	Pri Volts	271	110	309	288	290	248	369		432	350	357	266	357	366	367	348
	Prec mAmps	539	147	861	644	476	448	910		812	749	1070	581	1070	1020	1140	1020
	Sparks																
	N/S GND								GND								

Run #	3 - 1845																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	6	61	88	127	62	92	49	124	64	162	86	142	99	162	94	128
	Pri Volts	84	264	331	319	333	352	331	410	343	396	333	355	340	379	331	343
	Prec mAmps	28	406	616	616	315	609	196	959	329	1100	672	1070	567	1080	973	854
	Sparks			S			A			S		S				S	
	N/S GND																
B	Pri Amps	120	25	140	130	119	87	118		94	118	166	134	166	166	167	149
	Pri Volts	307	105	343	345	376	350	374		336	350	355	295	362	386	367	345
	Prec mAmps	756	140	973	945	889	469	616		455	742	1070	707	1070	110	1130	1120
	Sparks				S	A				S			A			CL	
	N/S GND								GND								

Run #	3 - 1915																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	10	98	90	145	68	112	43	154	54	168	86	144	91	144	90	127
	Pri Volts	100	321	338	328	336	350	309	415	333	400	336	357	312	3678	295	343
	Prec mAmps	49	511	504	777	315	833	238	1200	266	1090	693	1070	553	1040	910	861
	Sparks				S		A		A	S	A	S			A		
	N/S GND																
B	Pri Amps	167	28	117	165	107	88	116		93	118	167	105	167	166	167	150
	Pri Volts	355	115	340	343	338	350	372		352	348	360	302	362	388	367	348
	Prec mAmps	1200	154	1060	917	497	469	917		511	742	1070	724	1080	1120	1130	1020
	Sparks			S	S												
	N/S GND								GND								

Run #	3 - 1945																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	13	99	89	126	62	107	50	99	61	168	70	145	95	165	87	128
	Pri Volts	127	328	326	290	343	360	333	350	345	400	302	355	321	381	292	340
	Prec mAmps	49	707	518	665	273	819	203	658	238	1020	525	1070	532	1120	812	861
	Sparks			S	S								VL	S			
	N/S GND																
B	Pri Amps	168	24	144	122	62	88	100		115	118	166	130	164	166	166	152
	Pri Volts	352	105	336	331	271	350	345		393	348	352	330	360	388	364	345
	Prec mAmps	1170	133	1000	1000	364	462	784		609	749	1070	1160	1070	931	1140	1020
	Sparks	CL	S		S					P				CL			
	N/S GND								GND								

Run #	3 - 2015																
Set		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	14	84	94	140	70	86	36	124	58	164	89	144	68	165	113	127
	Pri Volts	120	321	338	336	336	290	390	408	340	400	321	3857	250	369	338	340
	Prec mAmps	56	749	630	714	357	567	196	1140	350	1110	455	1070	476	1090	826	861
	Sparks	P	S	S	S	S	A		A	S			VL				
	N/S GND																
B	Pri Amps	161	31	151	135	105	84	104		114	91	117	167	143	167	168	160
	Pri Volts	350	117	362	360	338	385	319		350	350	350	357	350	362	391	345
	Prec mAmps	1050	147	833	833	588	455	658		609	497	742	1060	868	1070	1110	1020
	Sparks		S							S	P						
	N/S GND								GND								

Run #	3 - 2045																
Set	0	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps	14	108	82	93	62	94	51	164	49	168	105	144	83	165	97	128
	Pri Volts	132	328	343	292	348	326	326	436	338	376	345	355	307	374	300	345
	Prec mAmps	77	630	637	742	357	623	238	1250	301	1100	686	1070	602	1090	770	854
	Sparks	S			S			S	S	S				A		S	
	N/S GND																
B	Pri Amps	100	32	167	151	72	91	115		86	119	166	147	167	166	167	149
	Pri Volts	280	124	321	367	292	352	369		336	350	355	376	362	391	369	345
	Prec mAmps	856	175	791	777	385	469	791		434	742	1080	987	1070	1120	1120	1020
	Sparks		S	S				VL		P			S				
	N/S GND								GND								

Run #																	
Set	0	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps																
	Pri Volts																
	Prec mAmps																
	Sparks																
	N/S GND																
B	Pri Amps																
	Pri Volts																
	Prec mAmps																
	Sparks																
	N/S GND																

Run #																	
Set	0	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
A	Pri Amps																
	Pri Volts																
	Prec mAmps																
	Sparks																
	N/S GND																
B	Pri Amps																
	Pri Volts																
	Prec mAmps																
	Sparks																
	N/S GND																

Run 1
Run Start @ 1015. Begin sampling on gas duct to precip closext to cooling lake (B side).
Started raising load load @ 1015 to 1045 640 MW to 660 MW.
Placed mill in service at 1029 (E Mill).
Started blowing IK's, IR's at 1045.
1200 still blowing air heaters.
3D mill sample port damaged, no samples from D mill.

Run 2
1345 still blowing air heaters, started some IR's.
1345 started outlet duct on west side (A side).
1510 E pulverizer off, Nox problems.

Run 3
Start at 1710
Suspended 1740-1810 umbilical problem.
1720 Still blowing air heater continuous. Slight change in coal, Fuel/FW ratio changing.
1735 Lost heater on umbilical. Swapped and recovered.
Blew platen IK's during Run 3.

APPENDIX F

Chain of Custody Records

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95 GI B3A
Job Name: EPRI - Cinergy
Location: Owensville, IN
Unit: Unit 3 Precipitator Inlet

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)
Run 2 - Container 1 Filter	3-29-00	1531	✓				II	BH									✓			Thimble: Q129 Filter: 47Q190
✓ Run 2 - Container 2 0.1 HNO_3 F.W.	3-29-00	1530	✓				I	BH									✓			Container 2A not recovered.
✓ Run 2 - Container 3 10% HNO_3 Rinse Imp 1,2,3	3-29-00	1540	✓				II	BH									✓			
✓ Run 2 - Container 4 0.1 N HNO_3 Rinse Imp 4	3-29-00	1544	✓				I	BH									✓			
✓ Run 2 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3-29-00	1552	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

REMARKS: Analyze according to the Ontario Hydro Method. Note: Run 1 Aborted.

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hyley	1000 3/30/00	Scott Hall	Scott Hall	3-31-00 0945	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
[illegible]	4/5/00 1330				
Received for Laboratory By/Signature: Evan Kaslan	Date/Time 4/7/00		Send Samples to: Phone:	Fax:	

Job# 99-956JB31-7 Unit Tested Unit 3 Precipitator

CHAIN OF CUSTODY RECORD

Facility Name/Location: Cinergy - Gibson Station, Owensville, Indiana

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Unit 3 Precipitator Inlet																				Analyze according to the Ontario Hydro method.
Run 3-Container 1 Filter	3/29/00	1846	✓				II	BH									✓			Thimble Q127 Filter 47 Q194
Run 3-Container 2 0.1 N HNO_3 F.W.	3/29/00	1845	✓				I	BH									✓			Container 2A not recovered
Run 3-Container 3 10% HNO_3 Rinse Imp 1,2,3	3/29/00	1851	✓				II	BH									✓			
Run 3-Container 4 0.1 N HNO_3 Rinse Imp. 4	3/29/00	1852	✓				I	BH									✓			
Run 3-Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3/29/00	1840	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
Billy Hughey	3/29/00	1850	Scott Hall	3-30-00	0940	KM (METCO)	4/3/00	716
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		

Ship to: TestAmerica RELINQUISHED BY SHIPPED [signature] 4/5/00 1330

Recieved by Test America: [illegible]

METCO ENVIRONMENTAL

Job# 99-95GIB8A Unit Tested Unit 3 Precipitator **CHAIN OF CUSTODY RECORD** Page # 1 of 1

Facility Name/Location: Cinergy - Gibson Station, Owensville, Indiana

Collected By/Company: METCO Environmental

Unit 3 Precipitator SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Run 4 - Container 1 Filter	3/29/00	2127	✓				II	BH									✓			Thimble Q128 Filter 47Q198
Run 4 - Container 2 0.1 N HNO_3 F.W.	3/29/00	2128	✓				I	BH									✓			Container 2A not recovered.
Run 4 - Container 3 10% HNO_3 Rinse Imp 1,2,3	3/29/00	2136	✓				II	BH									✓			
Run 4 - Container 4 0.1 N HNO_3 Rinse Imp 4	3/29/00	2138	✓				I	BH									✓			
Run 4 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3/29/00	2147	✓				I	BH									✓			used $NH_2OH \cdot H_2SO_4$

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
Bill [illegible]	3/29/00	2150	[illegible]	3-30-00	0940	[illegible] METCO	4/3/00	7/0/00
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		

Ship to: TestAmerica RELINQUISHED BY SHIPPED [illegible] 4/5/00 1330

Recieved by TestAmerica: [illegible] date: 4/7/00

METCO ENVIRONMENTAL

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95GIB3A
Job Name: EPRI - Cinergy
Location: Owensville, IN
Unit: Unit 3 Precipitator Inlet Duct

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)
Blank Train - Container 3 10% HNO_3 Rinse Imp 1,2,3	3-29-00	1518	✓				I	BH									✓			Note: Containers 1 & 2 not recovered.
Blank Train - Container 4 0.1 N HNO_3 Rinse Imp 4	3-29-00	1521	✓				I	BH									✓			
Blank Train - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3-29-00	1530	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
[illegible]	1000 3/30/00	[illegible]	[illegible]	3-31-00 0945	[illegible]
Relinquished By/Sign: [illegible]	Date/Time 4/5/00 1330	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature: Evan Kestas	Date/Time 4/7/00		Send Samples to: Phone:	Fax:	

F-5

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99 95GIB31A
Job Name: EPRI - Cinergy
Location: ~~Unit~~ Owensville, IN
Unit: Unit 3 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)
Run 2 - Container 1 Filter	3-29-00	1455	✓				I	BH									✓			Filter # 470190
Run 2 - Container 2 0.1 N HNO_3 F.W.	3-29-00	1456	✓				I	BH									✓			Container 2A not recovered.
Run 2 - Container 3 10% HNO_3 Rinse Imp 1,2,3	3-29-00	1505	✓				II	BH									✓			
Run 2 - Container 4 0.1 N HNO_3 Rinse Imp 4	3-29-00	1506	✓				I	BH									✓			
Run 2 - Container 5 0.1 N HNO_3 Rinse Imp. 5,6,7	3-29-00	1515	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill [illegible]	1000 3/30/00	[illegible]	[illegible]	3-31-00 0945	[illegible]
[illegible]	4/5/00 1330				

Received for Laboratory By/Signature: Eran Kuler
Date/Time: 4/7/00

Send Samples to:
Phone:
Fax:

Job# 99-95 GIB3A Unit Tested Unit 3 Stack

CHAIN OF CUSTODY RECORD

Facility Name/Location: Cinergy - Gibson Station, Owensville, Indiana

Collected By/Company: METCO Environmental

SAMPLE I.D. (Unit 3 Stack)	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Run 3 - Container 1 Filter	3/29/00	1815 ~~1800~~	✓				I	BH									✓			Filter # 47Q191
Run 3 - Container 2 0.1N HNO_3 F.W.	3/29/00	1817	✓				I	BH									✓			Container 2A not recovered
Run 3 - Container 3 10% HNO_3 Rinse Imp 1,2,3	3/29/00	1800	✓				II	BH									✓			
Run 3 - Container 4 0.1N HNO_3 Rinse Imp 4	3/29/00	1803	✓				I	BH									✓			
Run 3 - Container 5 0.1N HNO_3 Rinse Imp 5,6,7	3/29/00	1813	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
Bill Hyfy	3/29/00	1820	[illegible]	3-30-00	0940	[illegible] METCO	4/3/00	710
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		

Ship to: TestAmerica RELINQUISHED BY SHIPPED [illegible] 4/5/00 1330 Recieved by Test America: [illegible] date: 4/7/00

METCO ENVIRONMENTAL

Job# 99-95GUDSH Unit Tested Unit 3 Stack

CHAIN OF CUSTODY RECORD

Facility Name/Location: Cinergy - Gibson Station, Owensville, Indiana

Collected By/Company: METCO Environmental

Unit 3 Stack SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# OF CONTAINERS	RECOVERED BY	HCl	PART.	SO2	SO3	PCDD/PCDF	SEMI-VOC	POHC's	METALS	Hg			REMARKS (Specific Compounds/Methods)
Run 4 - Container 1 Filter	3/29/00	2152	✓				I	BH									✓			Filter
Run 4 - Container 2 0.1 N HNO_3 F.W.	3/29/00	2150	✓				I	BH									✓			Container 2A not recovered.
Run 4 - Container 3 10% HNO_3 Rinse Imp 1,2,3	3/29/00	2159	✓				II	BH									✓			
Run 4 - Container 4 0.1 N HNO_3 Rinse Imp 4	3/29/00	2200	✓				I	BH									✓			
Run 4 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3/29/00	2206	✓				I	BH												Used $NH_2OH \cdot H_2SO_4$

Received by:	Date:	Time:	Transported by:	Date:	Time:	Received at Lab by:	Date:	Time:
Bill [illegible]	3/29/00	2210	Scott [illegible]	3-30-00	0940	[illegible] METCO	4/13/00	715
Analyzed by:	**Date:**	**Time:**	**Data Reviewed by:**	**Date:**	**Time:**	**Remarks:**		

Ship to: TestAmerica SHIPPED RELINQUISHED [illegible] 4/5/00 1330

Received by TestAmerica: by: [illegible] date: 4/7/00

METCO ENVIRONMENTAL

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95GIB3A
Job Name: EPRI - Cinergy
Location: Owensville, IN
Unit: Unit 3 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)
Blank Train - Container 3 ~~0.1N~~ 10% HNO_3 Rinse Imp 1,2,3	3-29-00	1541	✓				I	BH									✓			Note: Containers 1 & 2 not recovered.
Blank Train - Container 4 0.1 N HNO_3 Rinse Imp. 4	3-29-00	1545	✓				I	BH									✓			
Blank Train - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	3-29-00	1553	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Huffey	1000 3/30/00	Scott Ford	Scott Ford	3-31-00 0945	[illegible]
Scott Ford	4/5/00 1330				

Received for Laboratory By/Signature: Evan Kesler
Date/Time: 4/7/00

Send Samples to:
Phone:
Fax:

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METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 1F45GIB3A
Job Name: EPRI / Cinergy
Location: Owensville, IN
Unit: Unit #3

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 0.1 NHNO3 Reagent Blank	3-28-00	1303	✓				I	BH									✓			Vol. = 50ml
Container 8 1 M KCl Reagent Blank	3-28-00	1302	✓				I	BH									✓			Vol. = 50 ml
Container 9 5% HNO3 - 10% H2O2 Reagent Blank	3-28-00	1301	✓				I	BH									✓			Vol. = 50ml
Container 10 H2SO4 - KMnO4 Reagent Blank	3-28-00	1300	✓				I	BH									✓			Vol. = 50 ml
Container 11 NH2OH - H2SO4 Reagent Blank	3-28-00	1259	✓				I	BH									✓			Vol. = 100 ml
Container 12 Filter Reagent Blank	3-28-00	1252	✓				IV	BH									✓			Thimble #'s Q111, Q115 Q119 Filter #'s 47Q195 47Q196 47Q197

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
[signature]	1:00 3/30/00	[signature]	[signature]	3-31-00 0945	[signature]
Relinquished By/Sign: [signature]	Date/Time 4/5/00 1330	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature: Evan Kaslan		Date/Time 4/7/00	Send Samples to: 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.

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 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.

CHRIS BREITLING, Environmental Technician I

Education	B.S. Bioenvironmental Science, August 1999; Texas A & M University, College Station, 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 testing procedures, 1999-Present.