Appendix C: SAMPLE CALCULATIONS

TABLE OF CONTENTS

A brief discussions of the data reduction procedures required to support this program is provided below. All calculations and data reduction procedures are compiled from 40 CFR Part 60, Appendix A for the specific Reference Methods. Included with each calculation is a brief definition of terms and general nomenclature utilized in the data reduction process.

Flow Rate Determination

The average gas velocity is determined from the gas density and from measurements of the average velocity head with a Pitot tube and inclined manometer.

Nomenclature

A = Cross sectional area of the stack or duct, (ft^2)

C_p = Pitot tube coefficient, dimensionless

MW_{dry} = Molecular weight of gas, dry basis, lb/lb-mole

MW_{wet} = Molecular weight of gas, moisture corrected, lb/lb-mole

P_{bar} = Uncorrected barometric pressure at test site, "Hg

P_g = Static pressure of gas, "Hg

P_s = Absolute pressure of gas, "Hg

ACFM = Effluent flow in actual feet per minute

SCFM = Effluent flow in standard cubic feet per minute

DSCFM = Effluent flow in dry standard cubic feet per minute

T_s = Average gas temperature, °F

Vel = Average gas velocity in feet per second

ΔP = Velocity Head of gas, "H_2O

ave ΔP = Average square root of the velocity head, "H_2O

% CO_2 = Percent carbon dioxide by volume, dry basis

% O_2 = Percent oxygen by volume, dry basis

% H_2O = Percent moisture of gas stream

Calculations

Stack Pressure:

$$P_s = P_{bar} + \left(\frac{P_g}{13.6}\right) \quad \text{(C-1)}$$

Molecular Weight - Dry Basis:

$$MW_{dry} = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (100 - \%CO_2 - \%O_2) \quad \text{(C-2)}$$

Molecular Weight - Wet Basis:

$$MW_{wet} = MW_{dry} \times \left[\frac{(1 - \%H_2O)}{100}\right] + 0.18 \times (\%H_2O) \quad \text{(C-3)}$$

Velocity (fps):

$$VPS = 85.49 \times C_p \times (\text{ave}\ \sqrt{\Delta P}) \times \sqrt{\frac{T_s + 460}{P_s \times MW_{wet}}} \quad \text{(C-4)}$$

Flow Rate (ACFM):

$$ACFM = (VPS) \times (A) \times 60 \quad \text{(C-5)}$$

Flow Rate (SCFM):

$$SCFM = 17.64 \times \left[\frac{P_s}{(T_s + 460)}\right] \times ACFM \quad \text{(C-6)}$$

Flow Rate (DSCFM):

$$DSCFM = 17.64 \times \left[\frac{100 - \%H_2O}{100}\right] \times \left[\frac{P_s}{(T_s + 460)}\right] \times ACFM \qquad (C\text{-}7)$$

Moisture Determination

A gas sample is extracted from the source and moisture is removed from the sample stream and determined gravimetrically.

Nomenclature

B_{wo} = Water vapor in gas stream, proportion by volume

P_{bar} = Uncorrected barometric pressure at test location, "Hg

T_m = Average dry gas meter temperature, °F

V_m = Volume of gas sampled as measured by dry gas meter, acf

V_{mstd} = Volume of gas sampled, corrected to standard conditions, dscf

V_{H2O} = Volume of condensate collected in the condenser system, (mL)

V_w = Volume of water vapor

Y_d = Dry gas meter calibration factor

DH = Average pressure differential, "H_2O

Volume of Water Vapor:

$$V_w = 0.04707 \times (V_{H2O}) \qquad (C\text{-}8)$$

Standard Sample Volume:

$$V_{MSTD} = 17.64\ (Y_d)\ (V_m) \times \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m + 460}\right] \qquad (C\text{-}9)$$

Water Vapor Fraction:

$$B_{wo} = \frac{V_w}{(V_w) + (V_{mstd})} \quad \text{(C-10)}$$

Percent Moisture:

$$\% \text{ Moisture} = B_{wo} \times 100 \quad \text{(C-11)}$$

Particulate Emission Determination

Particulate matter is extracted isokinetically from a source and collected on a heated substrate and condensed in the impinger train. The particulate mass is determined gravimetrically after removal of uncombined water.

A_n = Area of nozzle (ft^2)

B_{wo} = Water vapor in gas stream, proportional by volume

C_{part} = Particulate mass collected, mg

DH = Average orifice pressure drop, "H_2O

DSCFM = Effluent flow, dry standard cubic feet per minute

P_{bar} = Uncorrected barometric pressure at test location, "Hg

P_s = Absolute pressure of gas, "Hg

T = Total sample time, minutes

T_m = Average dry gas meter temperature, °F

T_s = Average gas temperature, °F

V_{H2O} = Volume of condensate collected, mL

V_m = Volume of gas sampled as measured by dry gas meter, acf

V_{mstd} = Volume of gas sampled, corrected to standard conditions, dscf

Vel = Average duct velocity, feet per second

Y_d = Dry gas meter calibration factor

% I = Isokinetic sampling rate

Calculations

Dry Gas Volume:

$$V_{MSTD} = 17.64\ (Y_d)\ (V_m)\ x \left[\frac{P_{bar} + (\Delta H/13.6)}{T_m + 460}\right] \quad \text{(C-12)}$$

Percent Isokinetic:

$$\%\ I = 0.09450\ x\ \frac{[(T_s + 460)\ x\ (V_{mstd})]}{(T)\ x\ (V_s)\ x\ (P_s)\ x\ (A_n)\ x\ (1 - B_{wo})} \quad \text{(C-13)}$$

Particulate Concentration:

$$gr/dscf = \frac{C(part)\ x\ 0.0154}{V_{mstd}} \quad \text{(C-14)}$$

Particulate Emission:

$$lb/hr = \frac{(gr/dscf)\ x\ DSCFM\ x\ 60}{7000} \quad \text{(C-15)}$$

PLANT YATES
ESP INLET/ALDEHYDES

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1310	0735	0720	-
Time Finish	1345	0805	0750	-
Operator	MKO	MKO	MKO	-
Initial Leak Rate	0.008	0.008	0.009	-
Final Leak Rate	0.009	0.006	0.007	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.009	1.009	1.009	-
Nozzle Diameter (inches)	0.2750	0.2750	0.2750	-
Barometric Pressure ("Hg)	29.51	29.40	29.39	29.43
Static Pressure ("H2O)	-6.4	-6.2	-6.0	-6.2
Meter Volume (acf)	12.281	10.395	10.275	10.984
Average square root of delta p	0.3230	0.3580	0.3132	0.3314
Average delta H (" H2O)	0.39	0.48	0.37	0.41
Average Stack Temperature (F)	315	311	314	313
Average DGM Temp (F)	79.9	76.9	77.7	78.2
Test Duration (minutes)	35.0	30.0	30.0	31.7
% CO2	10.5	10.2	10.8	10.5
% O2	8.5	8.6	8.3	8.5
% N2	81.0	81.2	80.9	81.0
Meter Volume (dscf)	11.964	10.148	10.009	10.707
Flue Gas Moisture (%)	7.9	8.0	8.3	8.1
Gas Molecular Weight (Wet) (g/g-mole)	29.07	29.02	29.06	29.05
Absolute Stack Pressure (" Hg)	29.04	28.94	28.95	28.98
Absolute Stack Temperature (R)	775	771	774	773
Average Gas Velocity (f/sec)	22.22	24.63	21.57	22.81
Avg Flow Rate (acfm)	645,978	716,039	627,156	663,058
Avg Flow Rate (dscfm)	393,345	436,243	379,432	403,007
Isokinetic Sampling Rate (%)	102.10	91.10	103.31	98.83

PLANT YATES
ESP INLET/MODIFIED METHOD 5

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1255	0729	707	-
Time Finish	1815	1341	1250	-
Operator	JWM	JWM	JWM	-
Initial Leak Rate	0.012	0.010	0.008	-
Final Leak Rate	0.015	0.018	0.014	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.999	0.999	0.999	-
Nozzle Diameter (inches)	0.3580	0.3580	0.3580	-
Barometric Pressure ("Hg)	29.51	29.40	29.39	29.43
Static Pressure ("H2O)	-6.4	-6.2	-6.0	-6.2
Meter Volume (acf)	103.779	115.043	111.153	109.992
Average square root of delta p	0.2399	0.2651	0.2470	0.2507
Average delta H (" H2O)	0.74	0.85	0.74	0.78
Average Stack Temperature (F)	295	304	300	300
Average DGM Temp (F)	85.4	84.7	87.1	85.7
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	180.8	202.6	203.5	195.6
% CO2	10.5	10.2	10.8	10.5
% O2	8.5	8.6	8.3	8.5
% N2	81.0	81.2	80.9	81.0
Meter Volume (dscf)	99.183	109.693	105.460	104.779
Flue Gas Moisture (%)	7.9	8.0	8.3	8.1
Gas Molecular Weight (Wet) (g/g-mole)	29.07	29.02	29.05	29.05
Absolute Stack Pressure (" Hg)	29.04	28.94	28.95	28.98
Absolute Stack Temperature (R)	755	764	760	760
Average Gas Velocity (f/sec)	16.30	18.15	16.86	17.10
Avg Flow Rate (acfm)	473,726	527,730	490,232	497,230
Avg Flow Rate (dscfm)	295,838	324,601	301,800	307,413
Isokinetic Sampling Rate (%)	96.84	97.61	100.93	98.46

PLANT YATES
ESP INLET/PSD

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1555	0925	0935	-
Time Finish	1740	1145	1130	-
Operator	MKO	MKO	MKO	-
Initial Leak Rate	0.015	0.018	0.016	-
Final Leak Rate	NA	NA	NA	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.988	0.988	0.988	-
Nozzle Diameter (inches)	0.2750	0.2750	0.2750	-
Barometric Pressure ("Hg)	29.51	29.40	29.39	29.43
Static Pressure ("H2O)	-6.4	-6.2	-6.0	-6.2
Meter Volume (acf)	30.730	43.462	40.653	38.282
Average square root of delta p	0.2650	0.2828	0.2915	0.2798
Average delta H (" H2O)	0.27	0.31	0.31	0.30
Average Stack Temperature (F)	318	320	318	319
Average DGM Temp (F)	84.8	85.0	94.0	87.9
Test Duration (minutes)	105.0	140.0	115.0	120.0
% CO2	10.5	10.2	10.8	10.5
% O2	8.5	8.6	8.3	8.5
% N2	81.0	81.2	80.9	81.0
Meter Volume (dscf)	29.041	40.910	37.631	35.861
Flue Gas Moisture (%)	7.9	8.0	8.3	8.1
Gas Molecular Weight (Wet) (g/g-mole)	29.07	29.02	29.06	29.05
Absolute Stack Pressure (" Hg)	29.04	28.94	28.95	28.98
Absolute Stack Temperature (R)	778	780	778	779
Average Gas Velocity (f/sec)	18.27	19.57	20.13	19.32
Avg Flow Rate (acfm)	531,075	568,922	585,210	561,736
Avg Flow Rate (dscfm)	322,049	342,614	352,234	338,966
Isokinetic Sampling Rate (%)	100.90	100.20	109.14	103.42

PLANT YATES
ESP INLET/VOST

Run No.	1A	1B	1C	2A	2B	2C	3A	3B	3C	Average
Date	6/21/93	6/21/93	6/21/93	6/22/93	6/22/93	6/22/93	6/23/93	6/23/93	6/23/93	-
Time Start	1400	1455	1550	0742	0910	1001	0742	0840	0932	-
Time Finish	1440	1535	1630	0822	0950	1041	0822	0920	1012	-
Operator	RVW	RVW	RVW	RVW	RVW	RVW	RVW	RVW	RVW	-
Initial Leak Rate	0.00 @ 17"	0.00 @ 15	0.00 @ 18	0.00 @ 17	0.00 @ 16	0.00 @ 15	0.00 @ 16	0.00 @ 15	0.00 @ 18	-
Final Leak Rate	0.00 @ 16"	0.00 @ 17	0.00 @ 15	0.00 @ 15	0.00 @ 16	0.00 @ 16	0.00 @ 15	0.00 @ 15	0.00 @ 16	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	-
Dry Gas Meter Calibration (Yd)	1.0113	1.0113	1.0113	1.0113	1.0113	1.0113	1.0113	1.0113	1.0113	-
Barometric Pressure ("Hg)	29.51	29.51	29.51	29.40	29.40	29.40	29.39	29.36	29.36	29.45
Static Pressure ("H2O)	-6.4	-6.4	-6.4	-6.2	-6.2	-6.2	-6.0	-6.0	-6.0	-6.3
Meter Volume (aL)	20.235	20.150	20.115	20.045	20.030	20.050	20.040	20.075	20.080	20.095
Average delta H (" H2O)	1.40	1.40	1.50	1.40	1.40	1.40	1.50	1.40	1.40	1.43
Average Stack Temperature (F)	295	295	295	304	304	304	300	300	300	300
Average DGM Temp (C)	26.3	28.5	29.7	24.0	26.7	29.3	25.6	29.4	31.8	27.2
Test Duration (minutes)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
% CO2	10.5	10.5	10.5	10.2	10.2	10.2	10.8	10.8	10.8	10.4
% O2	8.5	8.5	8.5	8.6	8.6	8.6	8.3	8.3	8.3	8.5
% N2	81.0	81.0	81.0	81.2	81.2	81.2	80.9	80.9	80.9	81.1
Meter Volume (dsL)	19.845	19.615	19.503	19.731	19.542	19.391	19.621	19.400	19.254	19.607
Flue Gas Moisture (%)	7.9	7.9	7.9	8.0	8.0	8.0	8.3	8.3	8.3	8.0
Gas Molecular Weight (Wet) (g/g-mole)	29.07	29.07	29.07	29.02	29.02	29.02	29.06	29.06	29.06	29.05
Absolute Stack Pressure (" Hg)	29.04	29.04	29.04	28.94	28.94	28.94	28.95	28.92	28.92	28.99
Absolute Stack Temperature (R)	755	755	755	764	764	764	760	760	760	760

PLANT YATES
ESP INLET/MULTI-METALS - PARTICULATE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0800	0935	0848	-
Time Finish	1405	1611	1405	-
Operator	JWM	JWM	JWM	-
Initial Leak Rate	0.014	0.006	0.017	-
Final Leak Rate	0.016	0.012	0.015	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.999	0.999	0.999	-
Nozzle Diameter (inches)	0.3580	0.3580	0.3580	-
Barometric Pressure ("Hg)	29.55	29.56	29.40	29.50
Static Pressure ("H2O)	-5.8	-5.8	-5.9	-5.8
Meter Volume (acf)	111.213	110.002	111.690	110.968
Average square root of delta p	0.2403	0.2490	0.2524	0.2472
Average delta H (" H2O)	0.77	0.74	0.76	0.76
Average Stack Temperature (F)	301	299	303	301
Average DGM Temp (F)	84.0	87.0	90.0	87.0
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	201.0	244.0	252.2	232.4
Filter Weight Gain (g)	21.4931	24.9809	26.2059	24.2266
PNR Weight Gain (g)	1.8780		0.3098	1.0939
% CO2	10.1	10.5	11.8	10.8
% O2	9.9	8.8	7.0	8.6
% N2	80.0	80.7	81.2	80.6
Meter Volume (dscf)	106.704	104.991	105.454	105.716
Flue Gas Moisture (%)	8.2	9.9	10.1	9.4
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.93	28.94
Absolute Stack Pressure (" Hg)	29.12	29.13	28.97	29.07
Absolute Stack Temperature (R)	761	759	763	761
Average Gas Velocity (f/sec)	16.37	16.99	17.29	16.89
Avg Flow Rate (acfm)	475,917	494,021	502,740	490,893
Avg Flow Rate (dscfm)	295,051	301,434	302,524	299,670
Isokinetic Sampling Rate (%)	104.46	100.61	100.69	101.92
Particulate Concentration (gr/dscf)	3.38E+00	3.67E+00	3.88E+00	3.64E+00
Particulate Concentration (lbs/dscf)	4.83E-04	5.25E-04	5.54E-04	5.21E-04
Particulate Emission (grams/sec)	1,077	1,196	1,268	1,180
Particulate Emission (lbs/hour)	8,550	9,489	10,064	9,367

PLANT YATES
ESP INLET/ANIONS

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	1225	1108	0715	-
Time Finish	1405	1213	0837	-
Operator	MKO	MKO	MKO	-
Initial Leak Rate	0.010	0.004	0.009	-
Final Leak Rate	0.004	0.009	0.006	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.003	1.003	1.003	-
Nozzle Diameter (inches)	0.3750	0.3750	0.3750	-
Barometric Pressure ("Hg)	29.55	29.56	29.40	29.50
Static Pressure ("H2O)	-5.8	-5.8	-5.4	-5.7
Meter Volume (acf)	64.816	44.245	45.140	51.400
Average square root of delta p	0.3161	0.3201	0.2783	0.3048
Average delta H (" H2O)	1.36	1.41	0.99	1.25
Average Stack Temperature (F)	290	282	310	294
Average DGM Temp (F)	85.0	88.0	76.0	83.0
Test Duration (minutes)	100.0	65.0	82.0	82.3
% CO2	10.1	10.5	11.8	10.8
% O2	9.9	8.8	7.0	8.6
% N2	80.0	80.7	81.2	80.6
Meter Volume (dscf)	62.414	42.391	43.933	49.579
Flue Gas Moisture (%)	8.2	9.9	10.1	9.4
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.94	28.94
Absolute Stack Pressure (" Hg)	29.12	29.13	29.00	29.09
Absolute Stack Temperature (R)	750	742	770	754
Average Gas Velocity (f/sec)	21.38	21.59	19.14	20.71
Avg Flow Rate (acfm)	621,544	627,741	556,462	601,915
Avg Flow Rate (dscfm)	390,837	392,000	332,388	371,741
Isokinetic Sampling Rate (%)	100.90	105.11	101.84	102.62

PLANT YATES
ESP INLET/AMMONIA-CYANIDE

Run No.	1	2	3	4	Average
Date	6/25/93	6/26/93	6/26/93	06/27/93	-
Time Start	1450	0930	1420	0920	-
Time Finish	1650	1035	1520	1040	-
Operator	MKO	MKO	MKO	MKO	-
Initial Leak Rate	0.010	0.009	0.009	0.006	-
Final Leak Rate	0.009	0.006	0.006	0.004	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.003	1.003	1.003	1.003	-
Nozzle Diameter (inches)	0.3750	0.3750	0.3750	0.3750	-
Barometric Pressure ("Hg)	29.55	29.56	29.56	29.40	29.56
Static Pressure ("H2O)	-5.8	-5.8	-5.8	-5.9	-5.8
Meter Volume (acf)	46.663	41.622	41.654	46.885	43.313
Average square root of delta p	0.3122	0.3122	0.3077	0.2871	0.3107
Average delta H (" H2O)	1.33	1.31	1.34	1.09	1.33
Average Stack Temperature (F)	289	283	284	315	285
Average DGM Temp (F)	88.0	80.0	94.0	83.0	87.3
Test Duration (minutes)	70.0	65.0	60.0	80.0	65.0
% CO2	10.1	10.5	10.5	11.8	10.4
% O2	9.9	8.8	8.8	7.0	9.2
% N2	80.0	80.7	80.7	81.2	80.5
Meter Volume (dscf)	44.684	40.459	39.470	45.054	41.538
Flue Gas Moisture (%)	8.2	9.9	9.9	10.1	9.3
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.84	28.94	28.90
Absolute Stack Pressure (" Hg)	29.12	29.13	29.13	28.97	29.13
Absolute Stack Temperature (R)	749	743	744	775	745
Average Gas Velocity (f/sec)	21.10	21.08	20.79	19.82	20.99
Avg Flow Rate (acfm)	613,466	612,867	604,440	576,283	610,258
Avg Flow Rate (dscfm)	386,272	381,939	376,181	341,573	381,464
Isokinetic Sampling Rate (%)	104.41	102.97	110.49	104.17	105.95

PLANT YATES
ESP INLET/RADIONUCLIDES

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0745	1540	1120	-
Time Finish	0907	1700	1240	-
Operator	MKO	MKO	MKO	-
Initial Leak Rate	0.009	0.010	0.007	-
Final Leak Rate	0.006	0.009	0.004	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.009	1.009	1.003	-
Nozzle Diameter (inches)	0.3750	0.3750	0.3750	-
Barometric Pressure ("Hg)	29.55	29.56	29.40	29.50
Static Pressure ("H2O)	-5.8	-5.8	-5.9	-5.8
Meter Volume (acf)	53.605	45.950	45.096	48.217
Average square root of delta p	0.3300	0.2905	0.2737	0.2981
Average delta H (" H2O)	1.48	1.10	0.96	1.18
Average Stack Temperature (F)	301	317	316	311
Average DGM Temp (F)	82.0	97.0	93.0	90.7
Test Duration (minutes)	82.0	80.0	80.0	80.7
% CO2	10.1	10.5	11.8	10.8
% O2	9.9	8.8	7.0	8.6
% N2	80.0	80.7	81.2	80.6
Meter Volume (dscf)	52.231	43.540	42.537	46.103
Flue Gas Moisture (%)	8.2	9.9	10.1	9.4
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.94	28.94
Absolute Stack Pressure (" Hg)	29.12	29.13	28.97	29.07
Absolute Stack Temperature (R)	761	777	776	771
Average Gas Velocity (f/sec)	22.48	20.06	18.91	20.49
Avg Flow Rate (acfm)	653,616	583,171	549,740	595,509
Avg Flow Rate (dscfm)	405,064	347,529	325,421	359,338
Isokinetic Sampling Rate (%)	99.35	98.94	103.23	100.51

PLANT YATES
ESP INLET/S.F. PARTICULATE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0800	0915	0740	-
Time Finish	1020	1125	0955	-
Operator	MKO	MKO	RVW	-
Initial Leak Rate	0.009	0.017	0.014	-
Final Leak Rate	NA	NA	NA	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.988	1.009	1.009	-
Nozzle Diameter (inches)	0.2750	0.2750	0.2750	-
Barometric Pressure ("Hg)	29.55	29.56	29.40	29.50
Static Pressure ("H2O)	-5.8	-5.8	-5.9	-5.8
Meter Volume (acf)	41.161	43.983	42.677	42.607
Average square root of delta p	0.2826	0.3289	0.2871	0.2995
Average delta H (" H2O)	0.31	0.41	0.32	0.35
Average Stack Temperature (F)	288	311	313	304
Average DGM Temp (F)	81.0	83.8	82.0	82.3
Test Duration (minutes)	130.0	120.0	135.0	128.3
% CO2	10.1	10.5	11.8	10.8
% O2	9.9	8.8	7.0	8.6
% N2	80.0	80.7	81.2	80.6
Meter Volume (dscf)	39.229	42.615	41.253	41.032
Flue Gas Moisture (%)	8.2	9.9	10.1	9.4
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.94	28.94
Absolute Stack Pressure (" Hg)	29.12	29.13	28.97	29.07
Absolute Stack Temperature (R)	748	771	773	764
Average Gas Velocity (f/sec)	19.09	22.62	19.80	20.50
Avg Flow Rate (acfm)	554,932	657,618	575,539	596,030
Avg Flow Rate (dscfm)	349,883	395,047	342,015	362,315
Isokinetic Sampling Rate (%)	101.33	105.61	104.97	103.97

PLANT YATES
ESP INLET/EXTRACTABLE METALS

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0945	1345	1300	-
Time Finish	1045	1505	1410	-
Operator	MKO	RVW	MKO	-
Initial Leak Rate	0.001	0.010	0.009	-
Final Leak Rate	0.004	0.007	0.006	-
Duct Dimensions (ft)	8.5 x 57	8.5 x 57	8.5 x 57	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.009	1.009	1.003	-
Nozzle Diameter (inches)	0.3750	0.3750	0.3750	-
Barometric Pressure ("Hg)	29.55	29.56	29.40	29.50
Static Pressure ("H2O)	-5.8	-5.8	-5.9	-5.8
Meter Volume (acf)	43.420	43.280	44.144	43.615
Average square root of delta p	0.3606	0.2676	0.3081	0.3121
Average delta H (" H2O)	1.75	0.96	1.22	1.31
Average Stack Temperature (F)	296	323	316	312
Average DGM Temp (F)	85.0	92.9	94.0	90.6
Test Duration (minutes)	60.0	80.0	70.0	70.0
% CO2	10.1	10.5	11.8	10.8
% O2	9.9	8.8	7.0	8.6
% N2	80.0	80.7	81.2	80.6
Meter Volume (dscf)	42.102	41.299	41.591	41.664
Flue Gas Moisture (%)	8.2	9.9	10.1	9.4
Gas Molecular Weight (Wet) (g/g-mole)	29.03	28.84	28.94	28.94
Absolute Stack Pressure (" Hg)	29.12	29.13	28.97	29.07
Absolute Stack Temperature (R)	756	783	776	772
Average Gas Velocity (f/sec)	24.49	18.55	21.29	21.44
Avg Flow Rate (acfm)	711,874	539,201	618,835	623,303
Avg Flow Rate (dscfm)	444,085	318,945	366,321	376,451
Isokinetic Sampling Rate (%)	99.83	102.26	102.48	101.52

PLANT YATES
ESP OUTLET/MODIFIED METHOD 5

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1249	0753	0712	-
Time Finish	1812	1247	1129	-
Operator	TJB	TJB	TJB	-
Initial Leak Rate	0.005	0.003	0.002	-
Final Leak Rate	0.005	0.005	0.005	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.997	0.997	0.997	-
Nozzle Diameter (inches)	0.1970	0.1970	0.1970	-
Barometric Pressure ("Hg)	29.51	29.40	29.36	29.42
Static Pressure ("H2O)	-11	-11	-11	-11
Meter Volume (acf)	126.423	127.680	118.467	124.190
Average square root of delta p	0.9096	0.9306	0.8958	0.9120
Average delta H (" H2O)	0.93	0.94	0.82	0.90
Average Stack Temperature (F)	280	280	275	278
Average DGM Temp (F)	86.5	84.6	83.5	84.9
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	207.6	212.4	211.2	210.4
% CO2	11.1	11.2	10.6	11.0
% O2	8.0	7.9	8.5	8.1
% N2	80.9	80.9	80.9	80.9
Meter Volume (dscf)	120.387	121.556	112.827	118.256
Flue Gas Moisture (%)	7.5	7.6	8.1	7.8
Gas Molecular Weight (Wet) (g/g-mole)	29.19	29.19	29.06	29.14
Absolute Stack Pressure (" Hg)	28.70	28.59	28.55	28.61
Absolute Stack Temperature (R)	740	740	735	738
Average Gas Velocity (f/sec)	61.39	62.93	60.55	61.62
Avg Flow Rate (acfm)	470,365	482,150	463,880	472,132
Avg Flow Rate (dscfm)	297,590	303,573	292,059	297,741
Isokinetic Sampling Rate (%)	101.70	100.67	97.12	99.83

PLANT YATES
ESP OUTLET/ALDEHYDES

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1232	0719	0655	-
Time Finish	1447	0928	0909	-
Operator	APE	APE	APE	-
Initial Leak Rate	0.010	0.002	0.007	-
Final Leak Rate	0.005	0.002	0.005	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.992	0.992	0.992	-
Nozzle Diameter (inches)	0.1900	0.1910	0.1910	-
Barometric Pressure ("Hg)	29.51	29.40	29.36	29.42
Static Pressure ("H2O)	-11	-11	-11	-11
Meter Volume (acf)	66.723	66.100	67.250	66.691
Average square root of delta p	0.8750	0.9583	0.9487	0.9273
Average delta H (" H2O)	0.78	0.89	0.81	0.82
Average Stack Temperature (F)	280	275	270	275
Average DGM Temp (F)	82.0	87.8	87.9	85.9
Test Duration (minutes)	135.0	129.0	135.0	133.0
% CO2	11.1	11.2	10.6	11.0
% O2	8.0	7.9	8.5	8.1
% N2	80.9	80.9	80.9	80.9
Meter Volume (dscf)	63.719	62.240	63.213	63.057
Flue Gas Moisture (%)	7.5	7.6	8.1	7.7
Gas Molecular Weight (Wet) (g/g-mole)	29.19	29.19	29.06	29.15
Absolute Stack Pressure (" Hg)	28.70	28.59	28.55	28.61
Absolute Stack Temperature (R)	740	735	730	735
Average Gas Velocity (f/sec)	59.06	64.58	63.90	62.51
Avg Flow Rate (acfm)	452,448	494,802	489,582	478,944
Avg Flow Rate (dscfm)	286,337	313,723	310,413	303,491
Isokinetic Sampling Rate (%)	106.92	98.71	96.82	100.82

PLANT YATES
ESP OUTLET/VOST

Run No.	1A	1B	1C	2A	2B	2C	3A	3B	3C	Average
Date	6/21/93	6/21/93	6/21/93	6/22/93	6/22/93	6/22/93	6/23/93	6/23/93	6/23/93	-
Time Start	1238	1323	1408	0736	0822	0909	0720	0809	0856	-
Time Finish	1318	1403	1444	0816	0902	0949	0800	0849	0936	-
Operator	DHD	DHD	DHD	DHD	DHD	DHD	DHD	DHD	DHD	-
Initial Leak Rate	0.0 @ 22"	0.0 @ 21"	0.0 @ 18"	0.0 @ 21"	0.0 @ 21"	0.0 @ 20"	0.0 @ 20"	0.0 @ 22"	0.0 @ 22"	-
Final Leak Rate	0.0 @ 14"	0.0 @ 12"	0.0 @ 24"	0.0 @ 11"	0.0 @ 9"	0.0 @ 12"	0.0 @ 11"	0.0 @ 17"	0.0 @ 11"	-
Duct Dimensions (ft)	11.3 x 11.	11.3 x 11.	11.3 x 11.	11.3 x 11.3	11.3 x 11.	11.3 x 11.	11.3 x 11.	11.3 x 11.	11.3 x 11.	-
Dry Gas Meter Calibration (Yd)	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036
Barometric Pressure ("Hg)	29.51	29.51	29.51	29.40	29.40	29.40	29.39	29.39	29.39	29.44571
Static Pressure ("H2O)	-11	-11	-11	-11	-11	-11	-11	-11		-11
Meter Volume (aL)	20.120	20.000	23.000	20.050	20.000	20.000	20.000	20.000	20.000	20.453
Average delta H (" H2O)	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Average Stack Temperature (F)	280	280	280	280	280	280	275	275	275	279
Average DGM Temp (C)	23.9	25.4	26.1	25.7	26.9	28.1	25.0	27.9	29.4	25.9
Test Duration (minutes)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
% CO2	11.1	11.1	11.1	11.2	11.2	11.2	10.6	10.6	10.6	11.1
% O2	8.0	8.0	8.0	7.9	7.9	7.9	8.5	8.5	8.5	8.0
% N2	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
Meter Volume (dsL)	19.874	19.647	22.544	19.609	19.480	19.400	19.596	19.409	19.309	20.021
Flue Gas Moisture (%)	7.5	7.5	7.5	7.6	7.6	7.6	8.1	8.1	8.1	7.6
Gas Molecular Weight (Wet) (g/g-mole)	29.19	29.19	29.19	29.19	29.19	29.19	29.06	29.06	29.06	29.17
Absolute Stack Pressure (" Hg)	28.70	28.70	28.70	28.59	28.59	28.59	28.58	28.58	29.39	28.64
Absolute Stack Temperature (R)	740	740	740	740	740	740	735	735	735	739

PLANT YATES
ESP OUTLET/PSD

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1436	1003	0907	-
Time Finish	2236	1550	1407	-
Operator	TJB	DD	DD	-
Initial Leak Rate	0.01	0.009	0.010	-
Final Leak Rate	NA	NA	NA	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.007	1.007	1.007	-
Nozzle Diameter (inches)	0.1910	0.1910	0.1910	-
Barometric Pressure ("Hg)	29.51	29.40	29.36	29.42
Static Pressure ("H2O)	-11	-11	-11	-11
Meter Volume (acf)	254.680	180.019	154.960	196.553
Average square root of delta p	0.9920	0.9460	0.9550	0.9643
Average delta H (" H2O)	0.95	0.90	0.86	0.90
Average Stack Temperature (F)	280	285	282	282
Average DGM Temp (F)	84.4	88.4	93.9	88.9
Test Duration (minutes)	480.0	350.0	300.0	376.7
% CO2	11.1	11.2	10.6	11.0
% O2	8.0	7.9	8.5	8.1
% N2	80.9	80.9	80.9	80.9
Meter Volume (dscf)	245.909	171.888	146.280	188.026
Flue Gas Moisture (%)	7.5	7.6	8.1	7.7
Gas Molecular Weight (Wet) (g/g-mole)	29.19	29.19	29.06	29.15
Absolute Stack Pressure (" Hg)	28.70	28.59	28.55	28.61
Absolute Stack Temperature (R)	740	745	742	742
Average Gas Velocity (f/sec)	66.95	64.17	64.85	65.32
Avg Flow Rate (acfm)	512,947	491,597	496,867	500,470
Avg Flow Rate (dscfm)	324,624	307,714	309,938	314,092
Isokinetic Sampling Rate (%)	101.30	102.44	100.98	101.57

PLANT YATES
ESP OUTLET/MULTI-METALS - PARTICULATE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0758	0925	0746	-
Time Finish	1316	1410	1210	-
Operator	TJB	TJB	TJB	-
Initial Leak Rate	0.010	0.005	0.008	-
Final Leak Rate	0.015	0.007	0.007	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.997	0.997	0.997	-
Nozzle Diameter (inches)	0.1970	0.1970	0.1970	-
Barometric Pressure ("Hg)	29.55	29.42	29.30	29.42
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	118.957	121.053	125.534	121.848
Average square root of delta p	0.8758	0.9165	0.9210	0.9044
Average delta H (" H2O)	0.79	0.86	0.90	0.85
Average Stack Temperature (F)	279	281	281	281
Average DGM Temp (F)	85.8	88.5	89.8	88.0
Test Duration (minutes)	241.0	240.0	240.0	240.3
Condensed Water (g)	243.4	258.9	277.2	259.8
Filter Weight Gain (g)	0.3241	0.2829	0.3586	0.3219
PNR Weight Gain (g)	0.1157	0.0801	0.1338	0.1099
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	113.537	114.483	117.971	115.330
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole)	28.98	28.91	28.92	28.94
Absolute Stack Pressure (" Hg)	28.74	28.61	28.49	28.61
Absolute Stack Temperature (R)	739	741	741	741
Average Gas Velocity (f/sec)	59.25	62.30	62.74	61.43
Avg Flow Rate (acfm)	456,368	479,816	483,235	473,140
Avg Flow Rate (dscfm)	284,170	295,247	294,874	291,430
Isokinetic Sampling Rate (%)	100.56	98.00	101.11	99.89
Particulate Concentration (gr/dscf)	5.98E-02	4.89E-02	6.44E-02	5.77E-02
Particulate Concentration (lbs/dscf)	8.54E-06	6.99E-06	9.20E-06	8.25E-06
Particulate Emission (grams/sec)	18.35	15.61	20.52	18.16
Particulate Emission (lbs/hour)	145.63	123.85	162.83	144.11

PLANT YATES
ESP OUTLET/ANIONS

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	1015	1113	0915	-
Time Finish	1152	1243	1038	-
Operator	APE	APE	TJB	-
Initial Leak Rate	< 0.001	0.005	0.010	-
Final Leak Rate	0.007	0.003	0.004	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.992	0.992	0.992	-
Nozzle Diameter (inches)	0.2230	0.2230	0.2290	-
Barometric Pressure ("Hg)	29.55	29.42	29.30	29.42
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	65.200	62.150	60.611	62.654
Average square root of delta p	0.9574	0.9558	0.9327	0.9486
Average delta H (" H2O)	1.50	1.53	1.60	1.54
Average Stack Temperature (F)	282	283	280	282
Average DGM Temp (F)	96.3	96.5	99.7	97.5
Test Duration (minutes)	97.0	90.0	83.0	90.0
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	60.855	57.738	55.768	58.121
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole)	28.98	28.92	28.92	28.94
Absolute Stack Pressure (" Hg)	28.74	28.61	28.49	28.61
Absolute Stack Temperature (R)	742	743	740	742
Average Gas Velocity (f/sec)	64.89	65.04	63.48	64.47
Avg Flow Rate (acfm)	499,777	500,985	488,928	496,563
Avg Flow Rate (dscfm)	310,071	307,637	298,858	305,522
Isokinetic Sampling Rate (%)	95.78	98.72	100.92	98.47

PLANT YATES
ESP OUTLET/AMMONIA-CYANIDE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0741	0930	0725	-
Time Finish	0930	1104	0856	-
Operator	TJB	APE	TJB	-
Initial Leak Rate	0.010	0.007	0.010	-
Final Leak Rate	0.015	0.006	0.007	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.992	0.992	0.992	-
Nozzle Diameter (inches)	0.2230	0.2230	0.2290	-
Barometric Pressure ("Hg)	29.55	29.42	29.30	29.42
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	73.525	64.150	63.443	67.039
Average square root of delta p	0.9680	0.9589	0.9434	0.9568
Average delta H (" H2O)	1.55	1.52	1.60	1.56
Average Stack Temperature (F)	280	279	279	280
Average DGM Temp (F)	87.3	88.2	91.5	89.0
Test Duration (minutes)	109.0	95.0	91.0	98.3
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	69.762	60.496	59.242	63.167
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole)	28.98	28.92	28.92	28.94
Absolute Stack Pressure (" Hg)	28.74	28.61	28.49	28.61
Absolute Stack Temperature (R)	740	739	739	740
Average Gas Velocity (f/sec)	65.52	65.10	64.18	64.93
Avg Flow Rate (acfm)	504,628	501,391	494,303	500,108
Avg Flow Rate (dscfm)	313,927	309,385	302,430	308,581
Isokinetic Sampling Rate (%)	96.51	97.43	96.63	96.86

PLANT YATES
ESP OUTLET/ S.F. PARTICULATE

Run No.	1	2	3	Average
Date	6/24-6/25/93	6/25-6/26/93	6/26-6/27/93	-
Time Start	0740	1130	1218	-
Time Finish	0700	0636	0627	-
Operator	DHD	DHD	DHD	-
Initial Leak Rate	0.012	0.005	0.005	-
Final Leak Rate	NA	NA	NA	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.007	1.007	1.007	-
Nozzle Diameter (inches)	0.2110	0.2110	0.2110	-
Barometric Pressure ("Hg)	29.53	29.55	29.42	29.5
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	852.132	687.620	711.797	750.516
Average square root of delta p	0.9581	0.9954	1.0651	1.0062
Average delta H (" H2O)	1.35	1.42	1.54	1.43
Average Stack Temperature (F)	281	279	281	280
Average DGM Temp (F)	89.8	91.3	92.9	91.3
Test Duration (minutes)	1375.8	1108.7	1055.5	1180.0
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	816.056	657.274	675.646	716.325
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole	28.98	28.92	28.92	28.94
Absolute Stack Pressure (" Hg)	28.72	28.74	28.61	28.69
Absolute Stack Temperature (R)	741	739	741	740
Average Gas Velocity (f/sec)	64.92	67.39	72.36	68.22
Avg Flow Rate (acfm)	500,013	519,062	557,350	525,475
Avg Flow Rate (dscfm)	310,378	322,050	341,884	324,771
Isokinetic Sampling Rate (%)	101.05	97.33	99.00	99.13

PLANT YATES
ESP OUTLET/RADIONUCLIDES

Run No.	1	2	3	Average
Date	6/24-6/25/93	6/25-6/26/93	6/26-6/27/93	-
Time Start	1040	1050	1055	-
Time Finish	0700	0640	0619	-
Operator	APE	TJB	DHD	-
Initial Leak Rate	< 0.001	0.005	0.005	-
Final Leak Rate	0.007	0.003	0.005	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.005	1.005	1.005	-
Nozzle Diameter (inches)	0.1970	0.1970	0.1970	-
Barometric Pressure ("Hg)	29.53	29.55	29.42	29.50
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	718.510	658.079	667.090	681.226
Average square root of delta p	1.1124	1.0092	1.0217	1.0478
Average delta H (" H2O)	1.27	1.10	1.20	1.19
Average Stack Temperature (F)	283	283	282	283
Average DGM Temp (F)	94.7	93.9	96.9	95.2
Test Duration (minutes)	1166.7	1182.4	1137.7	1162.3
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	680.531	624.352	626.886	643.923
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole)	28.98	28.92	28.92	28.94
Absolute Stack Pressure (" Hg)	28.72	28.74	28.61	28.69
Absolute Stack Temperature (R)	743	743	742	743
Average Gas Velocity (f/sec)	75.46	68.51	69.48	71.15
Avg Flow Rate (acfm)	581,204	527,706	535,180	548,030
Avg Flow Rate (dscfm)	359,951	325,606	327,622	337,726
Isokinetic Sampling Rate (%)	98.29	98.37	102.02	99.56

PLANT YATES
ESP OUTLET/EXTRACTABLE METALS

Run No.	1	2	3	Average
Date	6/24-6/25/93	6/25-6/26/93	6/26-6/27/93	-
Time Start	1300	1040	1137	-
Time Finish	0700	0636	0621	-
Operator	TJB	TJB	TJB	-
Initial Leak Rate	0.015	0.009	0.010	-
Final Leak Rate	0.014	0.006	0.010	-
Duct Dimensions (ft)	11.3 x 11.3	11.3 x 11.3	11.3 x 11.3	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.998	0.998	0.998	-
Nozzle Diameter (inches)	0.2300	0.2290	0.2290	-
Barometric Pressure ("Hg)	29.53	29.55	29.42	29.50
Static Pressure ("H2O)	-11.0	-11.0	-11.0	-11.0
Meter Volume (acf)	906.500	948.750	812.605	889.285
Average square root of delta p	1.1008	1.0954	0.9840	1.0601
Average delta H (" H2O)	2.49	2.30	1.90	2.23
Average Stack Temperature (F)	282	283	285	283
Average DGM Temp (F)	90.9	92.6	94.5	92.7
Test Duration (minutes)	1101.0	1103.1	1125.0	1109.7
% CO2	11.2	11.1	11.4	11.2
% O2	7.6	7.5	7.6	7.6
% N2	81.2	81.4	81.0	81.2
Meter Volume (dscf)	861.084	898.627	762.923	840.878
Flue Gas Moisture (%)	9.2	9.6	10.0	9.6
Gas Molecular Weight (Wet) (g/g-mole)	28.98	28.92	28.92	28.94
Absolute Stack Pressure (" Hg)	28.72	28.74	28.61	28.69
Absolute Stack Temperature (R)	742	743	745	743
Average Gas Velocity (f/sec)	74.63	74.35	67.06	72.01
Avg Flow Rate (acfm)	574,833	572,664	516,473	554,657
Avg Flow Rate (dscfm)	356,389	353,488	314,897	341,592
Isokinetic Sampling Rate (%)	97.65	103.45	96.67	99.26

PLANT YATES
STACK/MODIFIED METHOD 5

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1240	0655	0645	-
Time Finish	1755	1115	1118	-
Operator	EZ	EZ	EZ	-
Initial Leak Rate	< 0.001	< 0.001	0.002	-
Final Leak Rate	< 0.001	< 0.001	< 0.001	-
Stack Diameter (ft)	13.00	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.994	0.994	0.994	-
Nozzle Diameter (inches)	0.1960	0.1960	0.1950	-
Barometric Pressure ("Hg)	29.31	29.34	29.19	29.28
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	121.788	127.049	125.624	124.820
Average square root of delta p	0.8230	0.8251	0.7944	0.8142
Average delta H (" H2O)	0.85	0.85	0.77	0.82
Average Stack Temperature (F)	127	128	128	128
Average DGM Temp (F)	89.6	94.7	94.5	92.9
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	390.2	409.4	398.0	399.2
% CO2	10.2	10.8	10.2	10.4
% O2	8.8	8.6	8.5	8.6
% N2	81.0	80.6	81.3	81.0
Meter Volume (dscf)	114.171	118.129	116.237	116.179
Flue Gas Moisture (%)	13.9	14.1	13.9	14.0
Gas Molecular Weight (Wet) (g/g-mole	28.32	28.37	28.31	28.33
Absolute Stack Pressure (" Hg)	29.27	29.30	29.15	29.24
Absolute Stack Temperature (R)	587	588	588	588
Average Gas Velocity (f/sec)	49.73	49.83	48.15	49.24
Avg Flow Rate (acfm)	396,063	396,819	383,500	392,127
Avg Flow Rate (dscfm)	300,017	299,801	288,743	296,187
Isokinetic Sampling Rate (%)	100.47	104.02	107.37	103.95

PLANT YATES
STACK/METHOD 23

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1400	0812	0810	-
Time Finish	1933	1236	1249	-
Operator	DJV	DJV	DJV	-
Initial Leak Rate	0.008	0.001	0.002	-
Final Leak Rate	0.001	< 0.001	< 0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.029	1.029	1.029	-
Nozzle Diameter (inches)	0.1950	0.1950	0.1950	-
Barometric Pressure ("Hg)	29.31	29.34	29.19	29.28
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	114.442	118.294	115.263	116.000
Average square root of delta p	0.7956	0.8141	0.7932	0.8010
Average delta H (" H2O)	0.79	0.82	0.78	0.80
Average Stack Temperature (F)	123	128	129	127
Average DGM Temp (F)	80.6	86.9	87.3	84.9
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	392.0	390.6	387.5	390.0
% CO2	10.2	10.8	10.2	10.4
% O2	8.8	8.6	8.5	8.6
% N2	81.0	80.6	81.3	81.0
Meter Volume (dscf)	112.896	115.477	111.851	113.408
Flue Gas Moisture (%)	14.1	13.8	14.1	14.0
Gas Molecular Weight (Wet) (g/g-mole	28.30	28.41	28.29	28.33
Absolute Stack Pressure (" Hg)	29.27	29.30	29.15	29.24
Absolute Stack Temperature (R)	583	588	589	587
Average Gas Velocity (f/sec)	47.93	49.13	48.14	48.40
Avg Flow Rate (acfm)	381,724	391,287	383,360	385,457
Avg Flow Rate (dscfm)	290,495	296,622	287,675	291,598
Isokinetic Sampling Rate (%)	103.65	103.83	103.70	103.73

PLANT YATES

STACK/VOST

Run No.	1A	1B	1C	1D	2A	2B	2C	3A	3B	3C	Average
Date	6/21/93	6/21/93	6/21/93	6/21/93	6/22/93	6/22/93	6/22/93	6/23/93	6/23/93	6/23/93	-
Time Start	1325	1415	1515	1615	0650	0745	0840	0655	0805	0910	-
Time Finish	1405	1455	1555	1655	0730	0825	0920	0735	0845	0950	-
Operator	JEH	JEH	JEH	JEH	JEH	JEH	JEH	JEH	JEH	JEH	-
Initial Leak Rate	0.004 @ 20"	0.012 @ 22"	0.005 @ 20"	0.012 @ 20"	0.010 @ 20"	0.002 @ 20"	0.005 @ 21"	0.000 @ 21"	0.007 @ 21"	0.004 @ 10"	-
Final Leak Rate	0.010 @ 22"	0.011 @ 20"	0.000 @ 15"	0.010 @ 17"	0.007 @ 22"	0.004 @ 23"	0.009 @ 22"	0.004 @ 25"	0.000 @ 10"	0.000 @ 10"	-
Stack Diameter (ft)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	-
Dry Gas Meter Calibration (Yd)	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011
Barometric Pressure ("Hg)	29.35	29.35	29.35	29.35	29.34	29.34	29.34	29.23	29.23	29.23	29.33
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Meter Volume (aL)	26.485	20.210	20.250	20.200	20.260	20.240	20.640	20.200	20.200	20.200	21.061
Average delta H (" H2O)	2.40	2.10	2.30	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.23
Average Stack Temperature (F)	127	127	127	127	128	128	128	128	128	128	128
Average DGM Temp (F)	20.7	24.5	26.3	26.5	20.8	27.0	29.3	24.8	26.3	26.3	25.0
Test Duration (minutes)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
% CO2	10.2	10.2	10.2	10.2	10 8	10.8	10.8	10.2	10.2	10.2	10.4
% O2	8.8	8.8	8.8	8.8	8.6	8.6	8.6	8.5	8.5	8.5	8.7
% N2	81.0	81.0	81.0	81.0	80.6	80.6	80.6	81.3	81.3	81.3	80.9
Meter Volume (dsL)	26.389	19.864	19.793	19.725	20.164	19.722	19.965	19.759	19.662	19.662	20.673
Flue Gas Moisture (%)	13.9	13.9	13.9	13.9	14.1	14.1	14.1	13.9	13.9	13.9	14.0
Gas Molecular Weight (Wet) (g/g-mole)	28.32	28.32	28.32	28.32	28.37	28.37	28.37	28.31	28.31	28.31	28.34
Absolute Stack Pressure (" Hg)	29.31	29.31	29.31	29.31	29.30	29.30	29.30	29.19	29.19	29.19	29.29
Absolute Stack Temperature (R)	587	587	587	587	588	588	588	588	588	588	588

PLANT YATES
STACK/ALDEHYDES

Run No.	1	2	3	Average
Date	6/21/93	6/22/93	6/23/93	-
Time Start	1340	0715	0700	-
Time Finish	1408	0745	0730	-
Operator	DJV	DJV	DJV	-
Initial Leak Rate	0.001	< 0.001	0.007	-
Final Leak Rate	0.001	0.001	0.002	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.006	1.006	1.006	-
Nozzle Diameter (inches)	0.1747	0.1747	0.1747	-
Barometric Pressure ("Hg)	29.31	29.34	29.19	29.28
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	10.707	11.086	10.929	10.907
Average square root of delta p	0.7680	0.7681	0.7461	0.7607
Average delta H (" H2O)	0.46	0.45	0.43	0.45
Average Stack Temperature (F)	127	133	131	130
Average DGM Temp (F)	81.0	81.5	79.6	80.7
Test Duration (minutes)	28.0	30.0	30.0	29.3
% CO2	10.2	10.8	10.2	10.4
% O2	8.8	8.6	8.5	8.6
% N2	81.0	80.6	81.3	81.0
Meter Volume (dscf)	10.310	10.676	10.507	10.498
Flue Gas Moisture (%)	13.9	14.1	13.9	14.0
Gas Molecular Weight (Wet) (g/g-mole	28.32	28.37	28.31	28.33
Absolute Stack Pressure (" Hg)	29.27	29.30	29.15	29.24
Absolute Stack Temperature (R)	587	593	591	590
Average Gas Velocity (f/sec)	46.41	46.57	45.32	46.10
Avg Flow Rate (acfm)	369,602	370,850	360,938	367,130
Avg Flow Rate (dscfm)	279,942	277,918	270,646	276,169
Isokinetic Sampling Rate (%)	104.90	102.12	103.21	103.41

PLANT YATES
STACK/PSD

Run No.	1	2	3	Average
Date	6/21-6/22/93	6/22-6/23/93	6/23-6/24/93	-
Time Start	1330	1500	1553	-
Time Finish	0945	0953	1000	-
Operator	DJV	DJV	DJV	-
Initial Leak Rate	0.008	0.002	0.004	-
Final Leak Rate	NA	NA	NA	-
Stack Diameter (ft)	13.00	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.994	0.994	0.994	-
Nozzle Diameter (inches)	0.1960	0.1960	0.1960	-
Barometric Pressure ("Hg)	29.31	29.34	29.19	29.28
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	519.949	609.370	557.093	562.137
Average square root of delta p	0.8000	0.8367	0.8367	0.8245
Average delta H (" H2O)	0.80	0.87	0.87	0.85
Average Stack Temperature (F)	125	128	128	127
Average DGM Temp (F)	96.0	95.7	94.9	95.5
Test Duration (minutes)	987.0	1133.0	1080.0	1066.7
% CO2	10.2	10.8	10.2	10.4
% O2	8.8	8.6	8.5	8.6
% N2	81.0	80.6	81.3	81.0
Meter Volume (dscf)	481.761	565.595	515.177	520.844
Flue Gas Moisture (%)	13.9	14.1	13.9	14.0
Gas Molecular Weight (Wet) (g/g-mole)	28.32	28.37	28.31	28.33
Absolute Stack Pressure (" Hg)	29.27	29.30	29.15	29.24
Absolute Stack Temperature (R)	585	588	588	587
Average Gas Velocity (f/sec)	48.26	50.53	50.72	49.84
Avg Flow Rate (acfm)	384,346	402,434	403,909	396,896
Avg Flow Rate (dscfm)	292,105	303,896	304,155	300,052
Isokinetic Sampling Rate (%)	105.88	104.08	99.37	103.11

PLANT YATES
STACK/MULTI-METALS - PARTICULATE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0641	0921	0653	-
Time Finish	1152	1356	1106	-
Operator	DJV	DJV	DJV	-
Initial Leak Rate	0.002	0.001	0.001	-
Final Leak Rate	0.001	0.002	0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.029	1.029	1.029	-
Nozzle Diameter (inches)	0.1950	0.1950	0.1950	-
Barometric Pressure ("Hg)	29.33	29.36	29.21	29.30
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	114.190	113.406	115.002	114.199
Average square root of delta p	0.8017	0.7958	0.7974	0.7983
Average delta H (" H2O)	0.77	0.75	0.76	0.76
Average Stack Temperature (F)	128	130	130	130
Average DGM Temp (F)	75.1	83.0	90.4	82.8
Test Duration (minutes)	240.0	240.0	240.0	240.0
Condensed Water (g)	403.5	399.5	416.7	406.6
Filter Weight Gain (g)	0.0461	0.0326	0.0352	0.0380
PNR Weight Gain (g)	0.0117	0.0023	0.0016	0.0052
% CO2	10.9	11.4	11.6	11.3
% O2	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	113.874	111.558	111.039	112.157
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole	28.33	28.37	28.32	28.34
Absolute Stack Pressure (" Hg)	29.29	29.32	29.17	29.26
Absolute Stack Temperature (R)	588	590	590	590
Average Gas Velocity (f/sec)	48.47	48.13	48.40	48.33
Avg Flow Rate (acfm)	386,045	383,297	385,419	384,920
Avg Flow Rate (dscfm)	290,497	287,454	285,491	287,814
Isokinetic Sampling Rate (%)	104.55	103.51	103.74	103.93
Particulate Concentration (gr/dscf)	7.83E-03	4.83E-03	5.12E-03	5.93E-03
Particulate Concentration (lbs/dscf)	1.12E-06	6.90E-07	7.31E-07	8.47E-07
Particulate Emission (grams/sec)	2.46	1.50	1.58	1.84
Particulate Emission (lbs/hour)	19.51	11.90	12.52	14.64

PLANT YATES
STACK/ANIONS

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0940	1325	0845	-
Time Finish	1155	1536	1055	-
Operator	EBZ	EBZ	EBZ	-
Initial Leak Rate	< 0.001	< 0.001	< 0.001	-
Final Leak Rate	< 0.001	< 0.001	< 0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.006	1.006	1.006	-
Nozzle Diameter (inches)	0.1950	0.1950	0.1950	-
Barometric Pressure ("Hg)	29.33	29.36	29.21	29.30
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	62.495	60.363	61.975	61.611
Average square root of delta p	0.7874	0.7681	0.8183	0.7913
Average delta H (" H2O)	0.72	0.67	0.74	0.71
Average Stack Temperature (F)	132	133	133	133
Average DGM Temp (F)	91.1	104.5	100.3	98.6
Test Duration (minutes)	134.0	131.0	130.0	131.7
CO2%	10.9	11.4	11.6	11.3
O2%	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	59.157	55.834	57.465	57.486
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole	28.33	28.36	28.33	28.34
Absolute Stack Pressure (" Hg)	29.29	29.32	29.17	29.26
Absolute Stack Temperature (R)	592	593	593	593
Average Gas Velocity (f/sec)	47.76	46.57	49.78	48.04
Avg Flow Rate (acfm)	380,391	370,917	396,432	382,580
Avg Flow Rate (dscfm)	284,451	276,630	292,426	284,503
Isokinetic Sampling Rate (%)	99.35	98.63	96.76	98.25

PLANT YATES
STACK/AMMONIA-CYANIDE

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	0647	1145	0639	-
Time Finish	0904	1315	0809	-
Operator	EBZ	EBZ	EBZ	-
Initial Leak Rate	< 0.001	< 0.001	< 0.001	-
Final Leak Rate	< 0.001	0.001	< 0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	1.006	1.006	1.006	-
Nozzle Diameter (inches)	0.1950	0.1950	0.1950	-
Barometric Pressure ("Hg)	29.33	29.36	29.21	29.30
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	61.781	41.312	43.505	48.866
Average square root of delta p	0.7550	0.7681	0.7874	0.7702
Average delta H (" H2O)	0.68	0.69	0.72	0.70
Average Stack Temperature (F)	132	133	135	133
Average DGM Temp (F)	86.3	97.4	85.4	89.7
Test Duration (minutes)	137.0	90.0	94.0	107.0
% CO2	10.9	11.4	11.6	11.3
% O2	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	58.984	38.698	41.440	46.374
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole	28.33	28.36	28.33	28.34
Absolute Stack Pressure (" Hg)	29.29	29.32	29.17	29.26
Absolute Stack Temperature (R)	592	593	595	593
Average Gas Velocity (f/sec)	45.78	46.59	47.98	46.78
Avg Flow Rate (acfm)	364,612	371,043	382,091	372,582
Avg Flow Rate (dscfm)	272,827	276,537	280,900	276,755
Isokinetic Sampling Rate (%)	101.02	99.53	100.46	100.34

PLANT YATES
STACK/RADIONUCLIDES

Run No.	1	2	3	Average
Date	6/24-6/25/93	6/25-6/26/93	6/26-6/27/93	-
Time Start	1223	0840	1357	-
Time Finish	0153	0331	0614	-
Operator	JEH	JEH	JEH	-
Initial Leak Rate	< 0.001	0.010	< 0.001	-
Final Leak Rate	< 0.001	0.009	< 0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.994	0.988	0.988	-
Nozzle Diameter (inches)	0.2400	0.2400	0.2400	-
Barometric Pressure ("Hg)	29.33	29.33	29.36	29.34
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	599.556	654.007	696.609	650.057
Average square root of delta p	0.8459	0.8370	0.8524	0.8451
Average delta H (" H2O)	1.94	1.87	1.96	1.92
Average Stack Temperature (F)	130	129	131	130
Average DGM Temp (F)	97.3	93.0	97.7	96.0
Test Duration (minutes)	816.0	893.0	908.0	872.3
% CO2	10.9	11.4	11.6	11.3
% O2	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	556.184	607.560	642.493	602.079
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole)	28.33	28.36	28.33	28.34
Absolute Stack Pressure (" Hg)	29.29	29.29	29.32	29.30
Absolute Stack Temperature (R)	590	589	591	590
Average Gas Velocity (f/sec)	51.21	50.61	51.63	51.15
Avg Flow Rate (acfm)	407,813	403,033	411,204	407,350
Avg Flow Rate (dscfm)	306,199	302,339	305,914	304,817
Isokinetic Sampling Rate (%)	94.07	95.09	97.74	95.63

PLANT YATES
STACK/EXTRACTABLE METALS

Run No.	1	2	3	Average
Date	6/24-6/25/93	6/25-6/26/93	6/26-6/27/93	-
Time Start	1150	1246	1442	-
Time Finish	0725	0331	0616	-
Operator	EBZ	EBZ	EBZ	-
Initial Leak Rate	< 0.001	< 0.001	< 0.001	-
Final Leak Rate	< 0.001	0.001	< 0.001	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.994	1.029	1.029	-
Nozzle Diameter (inches)	0.2400	0.2400	0.2400	-
Barometric Pressure ("Hg)	29.33	29.33	29.36	29.34
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	818.991	600.910	618.386	679.429
Average square root of delta p	0.7874	0.8000	0.7616	0.7830
Average delta H (" H2O)	1.78	1.75	1.58	1.70
Average Stack Temperature (F)	129	125	126	127
Average DGM Temp (F)	97.6	89.1	90.6	92.4
Test Duration (minutes)	1112.0	857.0	880.0	949.7
CO2 %	10.9	11.4	11.6	11.3
O2%	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	759.081	585.462	601.172	648.572
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole)	28.33	28.36	28.33	28.34
Absolute Stack Pressure (" Hg)	29.29	29.29	29.32	29.30
Absolute Stack Temperature (R)	589	585	586	587
Average Gas Velocity (f/sec)	47.63	48.22	45.93	47.26
Avg Flow Rate (acfm)	379,362	384,045	365,815	376,407
Avg Flow Rate (dscfm)	285,223	289,842	274,469	283,178
Isokinetic Sampling Rate (%)	101.14	99.60	105.18	101.97

PLANT YATES
STACK/CHROME VI

Run No.	1	2	3	Average
Date	6/25/93	6/26/93	6/27/93	-
Time Start	1147	1041	0800	-
Time Finish	1434	1445	1150	-
Operator	JEH	JEH	JEH	-
Initial Leak Rate	< 0.001	< 0.001	0.007	-
Final Leak Rate	< 0.001	0.002	0.008	-
Stack Diameter (ft)	13.0	13.0	13.0	-
Pitot Tube Correction Factor (Cp)	0.84	0.84	0.84	-
Dry Gas Meter Calibration (Yd)	0.994	0.994	0.994	-
Nozzle Diameter (inches)	0.1950	0.1950	0.1950	-
Barometric Pressure ("Hg)	29.33	29.36	29.21	29.30
Static Pressure ("H2O)	-0.5	-0.5	-0.5	-0.5
Meter Volume (acf)	68.563	66.971	69.589	68.374
Average square root of delta p	0.7658	0.7689	0.7868	0.7738
Average delta H (" H2O)	0.69	0.69	0.71	0.70
Average Stack Temperature (F)	127	130	130	129
Average DGM Temp (F)	90.5	90.7	87.5	89.6
Test Duration (minutes)	144.0	144.0	146.0	144.7
CO2 %	10.9	11.4	11.6	11.3
O2%	7.8	7.4	7.4	7.5
% N2	81.3	81.2	81.0	81.2
Meter Volume (dscf)	64.184	62.738	65.242	64.054
Flue Gas Moisture (%)	14.3	14.5	15.0	14.6
Gas Molecular Weight (Wet) (g/g-mole)	28.33	28.36	28.33	28.34
Absolute Stack Pressure (" Hg)	29.29	29.32	29.17	29.26
Absolute Stack Temperature (R)	587	590	590	589
Average Gas Velocity (f/sec)	46.24	46.50	47.74	46.83
Avg Flow Rate (acfm)	368,270	370,354	380,212	372,945
Avg Flow Rate (dscfm)	277,922	277,614	281,887	279,141
Isokinetic Sampling Rate (%)	102.66	100.46	101.47	101.53

VOST FIELD DATA SHEET

PLANT Plant Yates Station Boiler No. 1
DATE 6/23/93
SAMPLING LOCATION ESP OUTLET
RUN NO. 3 TEST NO.
OPERATOR
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE 29.39
BLANK TUBE NUMBERS T: 14516A T/C: 14516B

ASSUMED MOISTURE % 7
METER BOX NO. V9
METER FACTOR 1.0355
PROBE HEATER SETTING 250-300
COMMENTS

Test Number	Leak Check ("Hg) Pre	Leak Check ("Hg) Post	Tube N (Lab)	Sampling (min)	Clock Time	Gas Meter Reading	Meter Pressure	Stack Temp	DGM Temp	Probe Temp	1st Condensor Outlet Temp.	2nd Condensor Outlet Temp.	Pump Vacuum ~~Temp~~
3A	0@20	0@11	T 14520 A	0	0720	0.00	1		73	311	58	58	8
				10	0730	5.05	1		75	324	55	56	8
			T/C 14520 B	20	0740	10.10	1		78	272	55	56	8
				30	0750	15.05	1		79	273	58	57	8
				40	0800	20.00	1		80	274	58	58	8
3B	0@22	0@17	T 14517 A	0	0809	0.00	1		81	270	59	59	5
				10	0819	5.0	1		82	300	58	58	5
			T/C 14517 B	20	0829	10.02	1		82	293	58	58	5
				30	0839	15.05	1		83	290	59	58	5
				40	0849	20.00	1		83	287	59	58	5
3C	0@22	0@11	T 14526 A	0	0856	0.00	1		84	260	56	58	5
				10	0906	5.06	1		85	273	61	59	5
			T/C 14526 B	20	0916	9.98	1		85	277	60	59	5
				30	0926	15.01	1		85	283	53	58	5
				40	0936	20.00	1		86	289	57	58	5
			T	0									
			T/C										

VOST FIELD DATA SHEET

PLANT Plant Yates Station Boiler No. 1
DATE 6/22/93
SAMPLING LOCATION ESP Out
RUN NO. 2 TEST NO.
OPERATOR
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE 29.40
BLANK TUBE NUMBERS T: 14533A T/C: 14533B

ASSUMED MOISTURE % 7
METER BOX NO. V-9
METER FACTOR 1.0355
PROBE HEATER SETTING 300
COMMENTS

Test Number	Leak Check ("Hg) Pre	Leak Check ("Hg) Post	Tube N (Lab)	Sampling (min)	Clock Time	Gas Meter Reading	Meter Pressure	Stack Temp	DGM Temp	Probe Temp	1st Condensor Outlet Temp.	2nd Condensor Outlet Temp.	Pump Vacuum ~~Temp~~
2A	0@21	0@11	T 14530 A	0	0736	0.00	1		78	300	61	60	7
				10	0746	5.08	1		78	304	63	61	7
			T/C 14530 B	20	0756	10.13	1		78	305	54	54	7
				30	0806	15.0	1		78	302	57	56	7
				40	0816	20.05	1		79	292	59	56	7
2B	0@21	0@9	T 14527 A	0	0822	0.00	1		79	262	58	54	4
				10	0832	5.00	1		80	273	57	55	4
			T/C 14527 B	20	0842	9.94	1		81	289	56	56	4
				30	0852	15.01	1		81	262	55	55	4
				40	0902	20.00	1		81	280	58	57	4
2C	0@20	0@12	T 14525 A	0	0909	0.00	1		82	267	60	58	4
				10	0919	4.98	1		82	278	58	57	4+1
			T/C 14525 B	20	0929	9.99	1		83	285	57	56	4+1
				30	0939	15.02	1		83	292	58	56	5
				40	0949	20.00	1		83	285	59	56	5
			T	0									
			T/C										

VOST FIELD DATA SHEET

PLANT Plant Yates Station Boiler No. 1
DATE 6/21/93
SAMPLING LOCATION ESP. Out
RUN NO. 1 TEST NO.
OPERATOR
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE 29.51
BLANK TUBE NUMBERS T: 14507A T/C: 14507B

ASSUMED MOISTURE % 7
METER BOX NO. V9
METER FACTOR 1.0355
PROBE HEATER SETTING
COMMENTS

Test Number	Leak Check ("Hg) Pre	Leak Check ("Hg) Post	Tube N (Lab)	Sampling (min)	Clock Time	Gas Meter Reading	Meter Pressure	Stack Temp	DGM Temp	Probe Temp	1st Condensor Outlet Temp.	2nd Condensor Outlet Temp.	Pump Vacuum ~~Temp~~
1-A	0@22	0@14	T	0	1238	0.00	1.1	190	74	207	55	52	10
		1450	06A	10	1248	4.9	1.1		75	218	55	51	11
			T/C	20	1258	109 ~~7.62~~	1.1		75	232	55	53	11
		1450	06B	30	1308	15.0	1.1		75	210	55	53	11
				40	1318	20.12	1.1		76	217	55	53	11
1-B	0@21	0@115	T	0	1323	0.00	1.0		77	221	56	53	4
		1450	11A	10	1333	5.2	1.0		77	254	57	54	4
			T/C	20	1343	9.9	1.0		78	256	55	53	4
		1450	11B	30	1353	14.96	1.0	190	78	248	54	53	4
				40	1403	20.00	1.0		79	227	53	53	4
1-C	0@18	0@24	T	0	1408	0.00	1.0		79	237	55	53	4 6
		1450	5A	10	1418	5.0	1.0	191	79	236	53	51	4 6
			T/C	20	1428	9.97	1.0		79	279	53	53	6
		1450	5B	30	1438	15	1.0		79	273	53	51	6
				40	~~14.44~~	23.00	1.0		79	281	53	53	6
			T	0									
			T/C										

ENTERED

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 1 of 2

SAMPLING LOCATION ~~Stack~~ OUTlet RUN NO. 1 MM-5

DATE 6/21/93 TIME START 1249 TIME FINISH 1812 TEST DURATION 320 240 WAW min.

DUCT DIMENSIONS 11.4 X 11.4 DIAMETER INITIAL LEAK RATE .005 @ 12" cfm

PTCF .84 DGMCF .997 NOZZLE DIA. .197 inches FINAL LEAK RATE .005 @ 10" cfm

BAR PRESS 29.51 "Hg

STATIC PRESS -11.0 "H2O OPERATOR TJB

Traverse Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
1-1	1249	376.971	.89	1.1	187	79	70	254	254	61	4.0	65
2	1254	380.3	.83	96	173	71	70	248	241	56	5.0	63
3	1259	382.1	.61	.74	192	73	70	249	255	46	5.0	53
4	1304	384.5	.3	.34	190	74	70	245	251	46	4.0	52
5	1309	386.15	.84	.40	191	74	71	257	250	46	4.5	54
6	1314	387.9	.58	.67	181	75	71	252	253	47	5.5	54
7	1319	389.9	.71	.85	161	77	72	246	249	45	6.0	51
8	1324	393.0	.75	.96	137	79	74	254	250	45		51
93 STOP	1329	395.072	Port change Leak ✓				.005		10"			
2-1	1343	395.9	.9	.91	187	79	78	239	252	47	7.0	56
2	1348	398.75	.7	.83	195	81	78	252	255	49	6.0	43
3	1354	401.8	.75	.89	197	83	78	245	245	50	6.0	49
4	1359	404.35	.9	1.1	198	84	78	255	249	50	7.0	42
5	1404	407.05	.7	.81	194	85	79	245	247	50	7.0	41
6	1409	409.65	.65	.76	182	86	80	252	260	50	6.0	41
7	1414	411.95	.73	TB 85.9	160	86	81	245	244	51	6.0	41
8	1419	414.7	.5	.63	153	87	82	249	261	51	5.0	41
STOP	1424	416.85	Port	change	Leak	✓						
3-1	1517	417.9	.54	.56	280	P 82	82	253	246	53	5.0	51
2	1522	420.5	.95	.98	280	83	82	254	255	56	6.5	51
3	1527	422.6	1.2	1.25	280	84	82	249	249	55	6.5	48
4	1532	425.3	1.3	1.35	281	87	83	253	255	56	6.5	43
5	1537	428.20	1.0	1.05	279	89	84	254	246	56	7.0	42
6	1542	431.35	.92	.96	279	90	84	245	245	58	7.0	45
7	1547	433.91	.73	.76	278	90	84	255	263	60	7.0	43
8	1552	436.45	.52	.54	276	90	85	245	264	63	5.0	42
STOP	1557	438.56										
			TAP		ABSOLUTE *							
Avg.	–	101.867	0.855		280	119.8						
Check'd	–	59.711										

CONSOLE # 161364

FILTER #

AMBIENT TEMP.

PROBE LENGTH 12

LINER MATERIAL GLASS

Velocity	61
% Moisture	7.4
Flowrate (DSCFM)	296,866
Isokinetic (%)	78

REMARKS

Nozzle ID 111

18.10 20.95 * STACK Temp IN Error during first 1/3 due to ELEC gr. problem

WAW

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 1 of 2

SAMPLING LOCATION Outlet RUN NO. 1
DATE 6/21/93 TIME START _____ TIME FINISH _____ TEST DURATION _____ min.
DUCT DIMENSIONS _____ X _____ DIAMETER _____ INITIAL LEAK RATE _____ cfm
PTCF _____ DGMCF _____ NOZZLE DIA. _____ inches FINAL LEAK RATE _____ cfm
BAR PRESS _____ " Hg
STATIC PRESS _____ " H2O OPERATOR _____

Traverse Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
4-1	1609	439.270	.85	.88	281	91	87	251	261	66	6.0	44
2	1609	441.85	1.1	1.15	281	91	87	253	267	63	7.0	46
3	1614	444.76	1.5	1.58	282	92	87	264	245	62	8.0	45
4	1619	448.1	1.5	1.58	281	93	87	253	246	60	8.0	42
5	1624	451.46	1.3	1.4	280	95	89	251	246	55	7.5	39
6	1629	454.75	1.1	1.2	280	95	88	248	245	54	7.0	40
7	1634	457.86	.9	.95	279	96	90	252	258	55	6.0	41
8	1639	460.68	.48	.51	274	96	90	253	251	55	5.0	42
STOP	1644	462.950		LEAK	✓	.005	@ 15	"				
5-1	1648	463.40	1.1	1.16	281	96	92	250	251	57	7.0	42
2	1653	466.39	.70	.75	280	96	91	256	253	54	6.0	42
3	1658	468.87	1.2	1.3	282	96	92	249	252	54	7.0	41
4	1703	471.8	1.4	1.5	282	97	92	247	252	54	8.0	41
5	1708	474.93	1.2	1.3	281	99	93	250	248	54	8.0	40
6	1713	478.12	.74	.78	279	99	93	259	257	55	6.0	43
7	1718	480.8	.83	.89	279	98	93	264	247	55	6.0	43
8	1723	483.4	.68	.72	263	97	93	252	263	55	5.0	42
9	1728	485.97		LEAK	✓ OK	.005	@ 10"					
6-1	1732	486.49	1.1	1.2	281	96	93	242	250	57	8.0	43
2	1737	489.49	.91	.97	281	97	93	243	257	55	7.0	43
3	1742	492.27	.64	.68	281	96	92	246	248	56	5.0	44
4	1747	494.69	.63	.67	281	96	92	250	258	58	4.7	47
5	1752	497.15	.63	.67	280	96	92	244	262	59	5.0	46
6	1757	499.1	.72	.76	280	95	92	255	262	60	6.0	47
7	1802	502.72	.86	.91	280	96	92	262	245	60	6.0	47
8	1807	504.1	.75	.8	278	96	92	255	260	61	6.0	49
STOP	1812	506.952										
		67.682	0.964			93.27						
		TB										
Avg.	–	129.471	0.910	.93	280	86.5						
Check'd	–	126.423										

CONSOLE # _____
FILTER # _____
AMBIENT TEMP. _____
PROBE LENGTH _____
LINER MATERIAL _____

Velocity _____
% Moisture _____
Flowrate (DSCFM) _____
Isokinetic (%) _____

REMARKS

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 1 of 7

SAMPLING LOCATION OUTLET RUN NO. 2
DATE 6/22/93 TIME START 0753 TIME FINISH 1247 TEST DURATION 240 min.
DUCT DIMENSIONS 11.4 X 11.3 DIAMETER INITIAL LEAK RATE .003 @10" cfm
PTCF .84 DGMCF .997 NOZZLE DIA. .197 inches FINAL LEAK RATE .005 @12" cfm
BAR PRESS 29.4 " Hg
STATIC PRESS -1.0 " H2O OPERATOR TJB

Traverse Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
#-1	0753	523.3	1.0	1.1	278	79	78	270	241	54	5	54
2	0758	526.5	.83	.88	281	82	78	265	260	60	4.0	46
3	0803	528.92	.58	.61	279	81	77	252	247	56	4.0	41
4	0808	531.07	.34	.4	275	83	79	250	262	55	8.0	42
5	0813	532.87	.36	.42	278	83	79	261	253	54		41
6	0818	534.60	.61	.65	279	83	79	247	248	53	4.0	41
7	0823	536.7	.73	.77	279	84	80	253	246	51	5.0	41
8	0828	539.04	.74	.78	272	85	80	263	252	49		47
STOP	0833	541.45		LEAK	✓	.005 @10"						
2-1	0858	542.026	.94	.99	278	79	78	257	253	64	6.0	55
2	0903	544.7	.8	.84	283	75	77	248	250	44	5.0	49
3	0908	547.17	.8	.84	280	81	77	255	252	44	5.0	49
4	0913	550.1	.96	1.0	283	83	78	265	244	43	5.0	48
5	0918	552.79	.82	.86	280	83	78	254	251	48	5.0	43
6	0923	554.92	.72	.76	241	84	79	244	245	45	5.0	50
7	0928	557.7	.69	.72	281	84	79	257	244	47	5.0	50
8	0933	559.77	.57	.59	272	85	80	256	247	48	5.0	50
STOP	0938	561.91	TB	LEAK	✓ .005 @10"							
3-1	0946	562.401	~~.75~~ .78	.78	283	83	80	246	250	48	5.0	52
2	0951	565.0	1.1	1.15	285	85	82	253	251	49	6.0	50
3	0956	567.77	1.2	1.25	285	87	82	247	248	49	6.0	48
4	1001	570.77	1.4	1.5	284	87	82	250	251	47	7.0	51
5	1006	574.0	1.2	1.25	283	87	82	250	254	48	6.0	50
6	1011	577.14	1.1	1.15	282	88	82	247	246	48	6.0	50
7	1016	58.13	.8	.84	281	89	83	265	255	50	5.0	50
8	1021	582.6	.59	.62	281	89	83	261	250	51		49
STOP	1026	584.95										
			0									
Avg.	–	61.7	$\overline{\Delta P}$ = .90		~~280~~ 281	84	80					
Check'd	–											

CONSOLE # 161364
FILTER #
AMBIENT TEMP.
PROBE LENGTH 12
LINER MATERIAL Glass

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

n=24

18.15
12.88

REMARKS

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1

SAMPLING LOCATION Outlet RUN NO. 2

DATE 6/22/93 TIME START ______ TIME FINISH ______ TEST DURATION ______ min.

DUCT DIMENSIONS ______ X ______ DIAMETER ______ INITIAL LEAK RATE ______ cfm

PTCF ______ DGMCF ______ NOZZLE DIA. ______ inches FINAL LEAK RATE ______ cfm

BAR PRESS ______ " Hg

STATIC PRESS ______ " H2O OPERATOR TJB

Traverse Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
4-1	1029	585.751	.85	.89	283	85	83	242	247	54	5.0	49
2	1034	587.9	1.1	1.15	285	89	84	245	252	52	6.0	51
3	1039	590.79	1.4	1.45	284	89	84	251	256	51	6.0	50
4	1044	593.9	1.5	1.57	284	90	84	250	246	51	7.0	51
5 3	1049	597.15	1.45	1.52	283	91	85	265	251	53	7.0	51
6 2	1054	600.5	1.2	1.25	282	91	85	262	252	53	6.5	50
7	1059	603.59	.85	.90	281	91	86	256	251	55	5.0	51
8	1104	606.35	.50	.53	277	91	86	244	246	58	4.0	51
STOP	1109	608.53		Leak	✓	.005	@ 10"					
5-1	1113	609.643	.91	.96	285	90	86	257	245	60	5.0	48
2	1118	612.3	.85	.89	284	91	86	256	275	58	5.0	48
3	1123	615.0	1.0	1.1	285	91	85	256	256	57	5.0	47
4	1128	617.74	1.5	1.6	284	91	86	262	250	56	7.0	47
5	1133	621.08	1.3	1.36	283	93	86	264	249	56	7.0	47
6	1138	624.4	.74	.78	283	94	87	259	254	52	5.0	45
7	1143	627.3	.81	.85	281	94	87	263	248	50	5.0	46
8	1148	629.55	.71	.75	279	92	86	256	255	50		46
STOP	1153	632.18	Leak	✓	.01 @	10"						
6-1	1207	632.55	1.1	1.15	285	86	84	254	256	58	6.0	52
2	1212	635.52	.95	1.0	288	87	84	262	249	49	5.0	48
3	1217	638.6	.6	.63	287	88	84	247	257	50	4.0	48
4	1222	640.77	.60	.63	287	89	85	254	253	51	4.0	49
5	1227	642.99	.69	.73	287	88	85	256	244	52	4.0	49
6	1232	645.38	.75	.78	286	87	84	246	254	52	5.0	48
7	1237	647.9	.82	.86	285	88	85	257	244	53	5.0	52
8	1242	650.3	.83	.87		87	84	262	257	52	5.0	48
STOP	1247	653.96										
	2 pages											
Avg.	–	~~52.66~~	.9306	.936	280	84.6						
Check'd	–	127.680										

CONSOLE # ______

FILTER # ______

AMBIENT TEMP. ______

PROBE LENGTH ______

LINER MATERIAL ______

Velocity ______

% Moisture ______

Flowrate (DSCFM) ______

Isokinetic (%) ______

REMARKS

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 1 of 2

SAMPLING LOCATION Outlet RUN NO. 3
DATE 6/23/93 TIME START 0712 TIME FINISH 1129 TEST DURATION 240 min.
DUCT DIMENSIONS 11.4 X 11.4 DIAMETER ____ INITIAL LEAK RATE .002@12" cfm
PTCF .84 DGMCF .992 NOZZLE DIA. .197 inches FINAL LEAK RATE .005@15" cfm
BAR PRESS 29.36 "Hg
STATIC PRESS -11.0 "H2O OPERATOR TJB

Traverse Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
1-1	0712	668.7	.95	.9[illegible]	280	75	72	247	255	68	8	55
2	0717	671.5	.80	.80	275	77	73	242	253	59	6	41
3	0722	673.83	.57	.56	274	81	75	259	245	56	5	43
4	0727	675.97	.35	.35	272	84	77	246	256	55	4	45
5	0732	677.65	.33	.33	274	84	77	246	244	56	4	50
6	0737	679.15	.60	.60	274	83	78	246	255	58	6.	51
7	0742	681.17	.64	.64	273	85	79	253	244	51	6	48
8	0747	683.50	.75	.75	269	85	79	256	251	50	7	47
STOP	0752	685.75	Leak	✓	.003	@15"						
2-1	0756	686.25	.86	.86	277	85	80	241	255	54	7	47
2	0801	688.8	1.69	.69	278	86	80	265	244	48	7	47
3	0806	691.0	.71	.71	277	86	80	260	243	47	7	46
4	0811	694.0	.95	.95	277	85	79	259	254	47	7	44
5	0816	695.77	.69	.69	274	85	79	264	247	47	7	45
6	0821	698.15	.60	.60	275	85	80	246	250	47	7	45
7	0826	700.27	.71	.71	274	85	80	252	260	48	7	46
8	0831	702.64	.57	.57	264	85	80	256	249	49	6	48
STOP	0836	704.79		Leak	✓ .005	@15"						
3-1	0839	705.235	.61	.61	278	83	80	240	251	58	7	51
2	0844	707.62	.96	.96	280	85	80	245	256	53	9	52
3	0849	709.9	1.2	1.2	279	85	80	248	262	52	10.0	53
4	0854	712.88	1.3	1.3	280	85	80	254	265	52	10.0	50
5	0859	716.0	.99	.99	277	85	80	246	254	56	9.0	53
6	0904	718.9	.91	.91	276	85	81	247	259	57	8.0	54
7	0909	721.8	.70	.70	276	84	80	258	246	59	7.0	55
8	0914	723.7	.51	.51		85	81	246	254	59	6.0	55
STOP	0919	725.744										
Avg.	–											
Check'd	–											

CONSOLE # 16364
FILTER # ____
AMBIENT TEMP. ____
PROBE LENGTH 12'
LINER MATERIAL Glass

Velocity ____
% Moisture ____
Flowrate (DSCFM) ____
Isokinetic (%) ____

REMARKS

CO_2 11.2 O_2 7.9 10.0% Bws

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 2 of 2

SAMPLING LOCATION Outlet RUN NO. 3 MM-5
DATE 6/23/93 TIME START _____ TIME FINISH _____ TEST DURATION _____ min.
DUCT DIMENSIONS _____ X _____ DIAMETER _____ INITIAL LEAK RATE _____ cfm
PTCF _____ DGMCF _____ NOZZLE DIA. _____ inches FINAL LEAK RATE _____ cfm
BAR PRESS _____ " Hg
STATIC PRESS _____ " H2O OPERATOR _____

Traverse Point	Clock Time	Dry gas meter reading ft3	^P in H	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
5-1	0922	725.92	.85	.85	280	84	81	256	251	55	8.0	51
2	0927	728.67	1.0	1.0	280	84	80	252	249	53	9.0	51
3	0932	731.44	1.3	1.3	281	84	80	283	260	51	10.0	49
4	0937	734.37	1.3	1.3	280	85	80	254	255	51	10.0	51
5	0942	737.7	1.3	1.3	280	87	81	245	257	52	10.0	51
6	0947	740.5	1.1	1.1	277	87	81	252	251	53	10.0	51
7	0952	743.7	.79	.79	277	86	81	248	261	55	7.0	51
8	0957	746.05	.48	.48	277	86	81	252	249	56	7.0	52
STOP	1002	748.052		LEAK	✓	.005	@15"					
5-1	1005	748.368	.98	.98	280	85	81	256	259	57	9.0	51
2	1010	750.79	.72	.72	282	86	81	249	244	57	7.0	53
3	1015	753.3	1.0	1.0	282	86	82	261	254	57	9.0	53
4	1020	755.75648	1.2	1.2	282	87	82	257	253	57	9.0	53
5	1025	758.30	1.2	1.2	281	88	82	258	254	56	9.0	52
6	1030	762.3	.71	.71	280	89	83	254	258	57	8.0	51
7	1035	764.55	.75	.75	280	88	83	241	245	58	7.0	52
8	1040	767.3	.68	.68	274	89	84	245	262	58		50
STOP	1045	769.243	.88									
6-1	1049	769.6	.88	.88	283	90	86	255	255	62	8.5	54
2	1054	772.18	.91	.91	284	91	87	262	258	55	9.0	50
3	1059	774.79	.62	.62	284	92	87	245	241	52	7.0	46
4	1104	776.65	.68	.68	283	92	88	266	250	52	7.0	47
5	1109	779.35	.65	.65	282	93	88	250	263	51	7.0	45
6	1114	781.64	.67	.67	281	91	88	245	255	50	7.0	47
7	1119	784.05	.85	.85	282	91	89	246	245	50	8.0	44
8	1124	786.5	.82	.82	283	91	89	251	251	49	8.0	48
STOP	1129	788.961			?							
Avg.	–	720.261	0.8958	.82	275	83.54						
Check'd	–	118.467										

CONSOLE # _____
FILTER # _____
AMBIENT TEMP. _____
PROBE LENGTH _____
LINER MATERIAL _____

Velocity _____
% Moisture _____
Flowrate (DSCFM) _____
Isokinetic (%) _____

REMARKS

MODIFIED METHOD 5 FIELD DATA SHEET

PLANT NAME Plant Yates Station Boiler No. 1 Page 1 of ____

SAMPLING LOCATION ESP Outlet RUN NO. FB.
DATE 6/20/93 TIME START 1001 TIME FINISH 1030 TEST DURATION 30min;w min.
DUCT DIMENSIONS 11.4 X 11.4 DIAMETER ____ INITIAL LEAK RATE .015 cfm
PTCF .84 DGMCF ____ NOZZLE DIA. .250 inches FINAL LEAK RATE .015 cfm
BAR PRESS 29.56 " Hg
STATIC PRESS -11.0 " H2O OPERATOR TJB

Traverse Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	Cond. Exit Temp. F
	10:15	356.3										
	10:30	357.12										
Avg.	–											
Check'd	–											

CONSOLE # 161364
FILTER # NA
AMBIENT TEMP. ____
PROBE LENGTH 12
LINER MATERIAL GLASS

Velocity ____
% Moisture ____
Flowrate (DSCFM) ____
Isokinetic (%) ____

REMARKS

ENTERED

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Aldehydes **Run No.** 1

Date 6/24/93 Time Start 1232 Time Finish 1447 Test Duration 135 min.

Duct Dimensions 114" X 114" Diameter ___ ft Initial Leak Rate .01/min@10" cfm

PTCF 0.84 DGMCF 0.992 Nozzle Dia. 0.190 inches Final Leak Rate .0050@10" cfm

Bar Press 29.51 " Hg

Static Press -1" " H2O Operator AE

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	1232	417.052	.79	.73	185	75	72	~~255~~ 250	259	58	4.5	
	1301	433.3	0.76	0.78	183	81	73	261	258	55	4.5	
	1316	440.8	0.76	0.77	178	84	75	257	258	59	4.5	
	1332	448.54	0.77	0.78	183	87	78	256	259	63	4.5	
	1345	455.14	0.77	0.79	190	89	80	255	252	64	4.5	
	1355	460.00	0.76	0.79	186	90	81	258	254	65	4.5	
	1410	467.50	0.75	0.78	181	91	87	255	257	67	4.5	
	1428	476.41	0.76	0.77	180	92	84	257	263	68	4.5	
	1447	485.776										
			√ΔP									
Avg.	—	66.723	0.815		184	86	78					
Check'd		✓ TB										

ERROR; Assume 280 WAN

CONSOLE # A161403

FILTER # ___

AMBIENT TEMP. 72°F

PROBE LENGTH 10'

LINER MATERIAL glass

Velocity	59
% Moisture	8.0
Flowrate (DSCFM)	283,851
Isokinetic (%)	105

REMARKS * These values are biased due to grounds of thermocouple leads. Actual temp approx 280°F

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Aldehydes **Run No.** 2

Date 6/24/93 Time Start 0719 Time Finish 0928 Test Duration 129 min.

Duct Dimensions 11'4" X 11'4" Diameter — ft Initial Leak Rate pass < 0.0025 cfm

PTCF .984 DGMCF .992 Nozzle Dia. .194 inches Final Leak Rate pass < 0.0025 cfm @ 8"

Bar Press 29.40 " Hg

Static Press -11 " H2O Operator APS

96.58
95.1
1.48

Travers (min) Time	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
0	0719	495.1	0.88	0.89	273	77	73	256	256	70	4"	
6.8		498.6	0.89	0.89	273	82	74	269	254	71	4	
21.3		506.14	0.88	0.87	274	90	79	256	258	62	4	
31.0		511.25	0.89	0.89	275	92	81	257	258	64	4	
44.0		518.15	0.93	0.90	275	93	83	257	255	57	4	
53.0		522.92	0.95	0.89	275	93	84	256	259	56	4	
63.5		528.46	0.91	0.89	275	95	85	258	253	56	4	
73.0		533.50	0.91	0.88	276	96	87	259	253	58	4	
84.6		539.6	0.94	0.89	276	97	88	256	257	58	4	
95.4		545.41	0.93	0.89	276	96	88	256	254	58	4	
106.2		551.15	0.95	0.89	276	96	88	255	254	58	4	
117.7		557.23	0.95	0.87	277	96	88	258	259	60	4	
129.3		561.2	0.93	0.86	277	95	88	258	259	62	4	
											88	
											275	
											.959	
				WAW							62.34	
			0.9583				✓				58.83	
Avg.	—	66.100	0.9195	0.885	275.2	87.8						
Check'd		✓ TJB		✓	✓TB							

.51

CONSOLE # 161403

FILTER # —

AMBIENT TEMP.

PROBE LENGTH 10'

LINER MATERIAL GLASS

Velocity

% Moisture

Flowrate (DSCFM)

Isokinetic (%)

REMARKS

SOURCE SAMPLING FIELD DATA SHEET

Page 1 of ___

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP Out **Train** Aldehydes **Run No.** 3

Date 6/23/93 Time Start 0654 Time Finish 0909 Test Duration 135 min.

Duct Dimensions 11'4" X 11'4" Diameter — ft Initial Leak Rate .007 cfm

PTCF 0.84 DGMCF .992 Nozzle Dia. .191 inches Final Leak Rate .005 cfm @ 15"

Bar Press 29.45 " Hg 29.36 DJV

Static Press -.11 " H2O Operator AE

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0655:30	572.6	0.89	0.81	269	79	72	263	255	62	3.5	
	0703	576.79	0.87	0.81	269	84	74	266	260	62	3.5	
	0711	580.78	0.89	0.81	269	88	77	259	261	60	3.5	
	0720:30	585.65	0.91	0.80	269	92	80	260	256	61	3.75	
	0732:45	591.60	0.90	0.80	269	95	83	258	261	60	3.75	
	0746	598.22	0.90	0.80	269	97	87	251	260	63	3.75	
	0804:45	607.23	0.92	0.81	271	97	89	257	259	65	3.75	
	0821	615.80	0.90	0.80	270	96	89	253	254	56	3.75	
	0832:30	621.60	0.90	0.80	271	95	89	258	253	53	3.75	
	0841:30	626.16	0.90	0.80	272	96	89	258	256	53	3.75	
	0859:45	635.33	0.92	0.81	272	96	89	256	258	53	3.75	
	0908:45	639.85										
			WPB									
Avg.	—	69.25	0.2144	0.805	270	87.9						
Check'd		✓TSB	0.9419		✓DB							

CONSOLE # 916403

FILTER # ___

AMBIENT TEMP. 69

PROBE LENGTH 12

LINER MATERIAL GLASS

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

REMARKS ___

6:55 - 9:08
120
13
133

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESPOUTLET **Train** Aldehydes **Run No.** FB

Date 6-20-93 Time Start _____ Time Finish _____ Test Duration _____ min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ Nozzle Dia. _____ inches Final Leak Rate _____ cfm

Bar Press 29.56 " Hg

Static Press _____ " H2O Operator JJB

Travers Point	Clock Time	Dry gas meter reading ft3	^ P in H2O	^ H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
Avg.	—											
Check'd												

CONSOLE # _____

FILTER # _____

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUTlet **Train** PSD **Run No.** 1

Date 6/21/93 Time Start 1436 Time Finish 2236 Test Duration @480 min.

Duct Dimensions 11.4 X 11.4 Diameter ____ ft Initial Leak Rate .01@15" cfm

PTCF .84 DGMCF 1.007 Nozzle Dia. .191 inches Final Leak Rate 0.008@15" cfm through the probe w/out impctn

Bar Press 29.51 " Hg

Static Press -11.0 " H2O Operator TJB

Travers Point	Clock Time	Dry gas meter reading ft3	ΔP in H2O	ΔH in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
0"	1436	62.87	.95	.98								
35"		82.85	.98	.95	278	85	78					
115"		88.12	.98	.95	278	84	78			.52cfm@90/80		
60"		96.01	.99	.95	277	87	80					
80"		106.42	.97	.95	278	85	80					
120"		127.32	.97	.95	276	85	81					138
140"		138.0	.97	.91	281	85	90				9	
180"		158.87	.99	.92	281	88	86				9	
210"		174.70	.98	.91	282	88	84				9	
240"		190.38	.98	.91	282	89	85				9	
249"		195.10	.98	.91	282	88	83				9	
270		206.08	.98	.91	282	87	83				9	
310	1946	225.73	0.98	0.93	283	86	81				9	
351	2027	247.52	1.00	0.97	282	85	81				9	
388	2104	267.27	1.00	0.97	282	86	81				9.5	
419	2135	283.52	1.00	0.97	283	87	81				10	
453	2209	302.04	1.00	0.98	283	88	82				10	
480	2236	316.850	1.00	0.98	278	90	83				10	
Avg.	—	254.68	.992	.95	280	84.4						
Check'd		✓	✓									

off

CONSOLE # 161396

FILTER # Set Y

AMBIENT TEMP. 71

PROBE LENGTH 7'

LINER MATERIAL S.S.

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

REMARKS 16.6 Sec. / LAP .5 @ NOZZle

C-54 .5 acfm @ meter

RADIAN CORPORATION

FIELD DATA

Run 2
Page 1 of 1

Plant	YATES	Probe Length and Type		Height of Location (ft)	
Date	6/22/93	Nozzle ID (in.)	.191	Duct Dimmensions	
Sampling Location	ESP OUT	Meter Box Number	A1H356	Filter Number	
Sample Type	PSD	Meter ΔH@	1.775	Assumed Moisture (%)	
Run Number	2	Yd	1.007	O2 (%)	7.9
Operator	Doerle	K Factor		CO2 (%)	11.2
Ambient Temperature	75	Probe Heater Setting	250±25	O2/CO2 Method	
Barometric Pressure	29.4	Heater Box Setting		Final Leak Check	
Static Pressure	-11	Initial Leak Check	0.009@10		

★ N2=80.9

.98 ΔP= .53 cfm@ 90/275

ΔP	ΔH
.97	.92
.92	.90
.84	.81

Diagram of Duct

16 53 48 80 848 2905 3753 55 22 104 106 1166 3735 49 01

Read and Record All Data Every _____ Minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24-hr)	Gas Meter Reading Vm (ft³)	Velocity Head Δ Ps (in. H2O)	Orifice Pressure Differential ΔH (in. H2O)	Flue Gas Temperature (°F)	Filter Temperature (°F)	Dry Gas Meter Temperature Inlet (°F)	Dry Gas Meter Temperature Outlet (°F)	Impinger Exit (°F)	Pump Vacuum (in. H2O)
	0	1003	329.05								
	14		37.35	.97	.89	281		84	81		8
	38		48.93	.97	.90	281		86	82		9
	135		83.64	.92	.90	282		88	82		9
	133		98.29	.91	.90	285		89	93		9
	174		430.68	.92	.9	286		93	90		9
	238		453.05	.84	.81	288		92	89		9
	259		464.5	.83	.80	286		93	91		8
	320	1518	474.9	.81	.79	287		92	90		8
Stop	350	1550	509.069								
			180.019	√ΔP 0.1577		284.5		88.4			
			TB	0.946							

NBW averaging error

Comments:

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUTLET **Train** PSD **Run No.** 3

Date 6/23/93 Time Start 09:07 Time Finish ____ Test Duration 300 min.

Duct Dimensions 11.4" x 11.4" Diameter ____ ft Initial Leak Rate 0.01 @ 17" cfm

PTCF .84 DGMCF 1.007 Nozzle Dia. .191 inches Final Leak Rate N/A cfm

Bar Press 28.39 " Hg

Static Press -11 " H2O Operator [illegible]

2409
1959
9[illegible]50
6

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	19.59	.88	.84	276	79	79				8	
	~~[illegible]~~ 14	26.6	.88	.84	276	81	79				8	
	35	37.0	.90	.84	278	89	85				8	
	67	53.24	.90	.84	280	92	88				8	
	104	72.15	.92	.84	283	97	92				8	
	121	80.70	.89	.84	283	99	94				8	
	137	88.85	.94	.89	283	99	95				8	
	200	122.0	.93	.89	285	101	97				8	
	233	139.4	.93	.89	286	105	100				8.5	
	258	156.6	.93	.89	286	106	101				8.5	
	288	168.3	.93	.89	287	107	102				8.5	
	300	174.55										
Avg.	—	154.960	0.955	0.863	282	93.9	X					
Check'd		✓			✓							

CONSOLE # A161396
FILTER # Set 5
AMBIENT TEMP. ____
PROBE LENGTH 8'
LINER MATERIAL S-Steel

Velocity ____
% Moisture ____
Flowrate (DSCFM) ____
Isokinetic (%) ____

REMARKS Purge 30 min

SOURCE SAMPLING FIELD DATA SHEET

Plant Name PTV Plant Yates Station Boiler No. 1

Sampling Location ESP Outlet Train Particulate / Metals Run No. 1

Date 6/24-25 Time Start 0758 Time Finish 1316 Test Duration 241 min.

Duct Dimensions 11.4" X 11.4" Diameter ft Initial Leak Rate .241 @ 10" .015 @ 15" cfm

PTCF .84 DGMCF .997 NOZZLE DIA. .197 inches Final Leak Rate .015 @ 15" cfm

Bar Press 29.55 " Hg

Static Press -11.0 " H2O Operator TJB/APE

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
1-1	0758	827.24	.83	.8	274	72	71	246	244	66	5.0	
2	0803	830.3	.70	.78	278	72	71	248	254	62	4.0	
3	0808	832.12	.40	.38	278	75	72	249	242	61	3.0	
4	0813	833.9	.26	.25	277	77	73	253	261	62	3.0	
5	0818	835.35	.23	.28	278	77	73	266	255	63	3.0	
6	0823	836.35	.50	.48	278	77	73	244	258	63	4.0	
7	0828	838.7	.62	.60	278	78	74	254	266	62	4.0	
8	0833	841.0	.68	.66	276	79	75	244	264	60	4.0	
STOP	0838	843.02		LEAK	✓	.010 @	10"					
2-1	0843	843.675	.89	.87	282	81	76	256	266	59	5.0	
2	0848	846.14	.68	.67	282	82	76	256	259	59	5.0	
3	0853	848.8	.68	.67	282	83	77	245	247	58	4.0	
4	0858	850.61	.92	.92	281	84	78	255	260	59	5.0	
5	0903	853.8	.66	.66	281	85	78	246	260	60	5.0	
6	0908	855.53	.60	.60	280	86	78	253	267	60	5.0	
7	0913	857.73	.76	.76	278	86	79	249	247	61	5.0	
8	0918	859.07	.62	.62	277	86	80	250	246	60	5.0	
STOP	0923	862.38		LEAK	.007	@ 10"						
* 3-8	0943	862.99	.48	.48	275	85	83	244	247	65	4.0	
7	0948	865.5	.67	.67	278	86	82	246	257	61	3.5	
* 6	0954	867.65	.93	.93	280	86	82	254	264	56	5.0	
5	0959	870.90	1.0	1.0	280	87	83	250	245	56	5.0	
4	1004	873.1	1.3	1.3	282	89	84	254	265	57	5.0	
3	1009	875.7	1.2	1.2	283	90	84	266	246	55	5.0	
2	1014	879.0	.92	.92	283	92	86	246	244	54	5.0	
1	1019	881.53	1.0	1.0	283	93	87	257	243	53	5.5	
STOP	1024	881.372										
Avg.	—											
Check'd												

CONSOLE # 161364

FILTER #

AMBIENT TEMP.

PROBE LENGTH

LINER MATERIAL

Velocity

% Moisture

Flowrate (DSCFM)

Isokinetic (%)

1ST NITRIC RINSE CAUGHT W/ACETON RINSE (F. ½). SECOND RINSE PERFORMED.

REMARKS .197 Nozzle Nozzle ID 11 K = .973

4/ * Sampled PT6 @ 5 min. 1.04 * started sampling at point 8

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP Outlet **Train** Particulate / Metals **Run No.** 1

Date _____ Time Start _____ Time Finish _____ Test Duration _____ min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ NOZZLE DIA. _____ inches Final Leak Rate _____ cfm

Bar Press _____ " Hg

Static Press _____ " H2O Operator TJB

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
4-8	1028	884.641	.60	.60	276	90	87	248	247	59	4.0	
7	1033	887.00	.82	.82	278	92	88	253	261	56	5.0	
6	1038	889.3	1.10	1.10	279	93	89	249	246	52	5.0	
5	1043	892.07	1.3	1.3	280	93	89	253	267	52	5.5	
4	1048	895.14	1.4	1.4	280	95	90	250	250	52	6.0	
3	1053	898.27	1.3	1.3	282	96	90	252	256	52	6.0	
2	1058	901.8	1.1	1.1	283	96	91	248	265	52	5.5	
1	1103	904.3	.81	.81	283	96	91	256	241	53	5.0	
STOP	1108	907.000			LEAK	✓	@ 15"	15"				
5-8	1151	907.516	.71	.71	275	92	90	244	246	65	4.5	
7	1156	910.0	.82	.82	278	93	90	253	249	54	5.0	
6	1201	912.6	.68	.68	279	94	90	244	251	55	5.0	
5	1206	914.75	.90	.90	280	94	90	253	266	53	5.0	
4	1211	918.0	1.3	1.3	282	94	90	250	253	49	5.0	
3	1216	920.32	1.1	1.1	283	95	90	256	257	49	5.0	
2	1221	923.25	.68	.68	283	96	90	251	263	50	5.5	
1	1226	925.62	.69	.69	283	96	91	248	246	52		
STOP	1231	928.027		LEAK	✓	.007	@ 15"					
6-8	1235	928.27	.80	.80	279	96	92	250	255	52	5.0	
7	1241	931.64	.85	.85	279	96	92	257	244	48	5.0	
6	1246	934.22	.75	.75	280	98	92	247	245	48	5.0	
5	1251	936.7	.64	.64	281	98	92	254	246	49	4.0	
4	1256	938.95	.65	.65	282	98	93	249	267	49	4.0	
3	1301	941.19	.57	.57	282	98	93	257	264	49	4.0	
2	1306	943.32	.89	.89	283	97	94	249	252	49	5.0	
1	1311	945.8	.96	.96	284	98	94	265	249	48	5	
STOP	1316	948.490										
Avg.	—											
Check'd		118.957	0.8896	0.81	280	96.7						

↳ DOES NOT INCLUDE LEAK CKS-DRN

CONSOLE # _____

FILTER # _____

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Particulate / Metals **Run No.** 2

Date 6/26/93 Time Start 0925 Time Finish 1131 Test Duration 240 min.

Duct Dimensions 11.4 x 11.4 Diameter ____ ft Initial Leak Rate .005@12" cfm

PTCF .84 DGMCF .997 NOZZLE DIA. .197 inches Final Leak Rate .007@10" cfm

Bar Press 29.42 " Hg

Static Press -1.0 " H2O Operator TJB K=.975

Travers Point	Clock Time	Dry gas meter reading ft3	^ P in H2O	^ H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
1-8	0925	959.3	.65	.65	270	75	75	254	262	58	4.0	
7	0930	961.4	.81	.81	277	75	75	255	268	49	4.0	
6	0935	963.85	.60	.58	278	75	75	249	266	47	4.0	
5	0940	965.87	.35	.34	279	78	76	251	259	51	4.0	
4	0945	967.48	.34	.33	276	79	76	249	261	51	3.6	
3	0950	969.1	.60	.58	280	80	77	252	266	53	4.0	
2	0955	971.0	.82	.81	281	80	77	247	247	52	4.0	
1	1000	973.8	.86	.84	280	81	78	245	258	51	5.0	
STOP	1005	976.065		LEAK	✓	.007	@12"					
2-8	1008	976.5	.53	.52	274	84	80	253	252	58	4.0	
7	1013	978.53	.80	.79	278	86	81	256	255	57	4.0	
6	1018	980.91	.62	.62	279	86	81	244	248	53	4.0	
5	1023	983.01	.73	.73	281	86	81	254	264	55	4.0	
4	1028	985.5	.99	.99	282	86	82	249	245	53	5.0	
3	1033	988.2	.78	.78	283	89	83	264	253	52	4.0	
2	1038	990.36	.70	.70	283	90	84	250	254	53	4.0	
1	1043	992.70	.98	.98	284	91	84	249	249	54	4.0	
STOP	1048	995.32		LEAK	✓	.01@	15"					
3-8	1051	996.0	.63	.63	278	92	86	254	259	57	4.0	
7	1056	998.3	1.0	1.0	279	93	87	253	247	55	5.0	
6	1101	1001.02	1.2	1.2	281	93	87	247	251	54	5.0	
5	1106	1003.75	1.3	1.3	282	95	88	246	248	56	5.0	
4	1111	1006.75	1.3	1.3	283	95	87	248	246	54	5.5	
3	1116	1009.7	1.1	1.1	283	95	88	256	263	56	6.0	
2	1121	1012.7	.72	.72	283	95	88	252	255	57	5.0	
1	1126	1015.05	.70	.70	284	94	88	253	260	59	5.0	
STOP	1131	1017.40										
Avg.	—	121.055	.9165	.8600	281.1		885					
Check'd												

CONSOLE # 161364

FILTER # ____

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet Train Particulate / Metals Run No. 2

Date _____ Time Start _____ Time Finish _____ Test Duration _____ min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ NOZZLE DIA. _____ inches Final Leak Rate _____ cfm

Bar Press _____ " Hg

Static Press _____ " H2O Operator _____

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
4-8	1133	17.885	.44	.44	277	93	88	253	261	63	4.0	
7	1138	19.66	.80	.80	279	93	88	255	254	62	5.0	
6	1143	22.15	1.20	1.20	281	93	89	251	263	61	6.0	
5	1148	25.13	1.30	1.30	281	93	89	247	251	60	6.0	
4	1153	28.2	1.4	1.4	283	95	89	252	262	61	6.0	
3	1158	31.39	1.4	1.4	284	96	90	247	255	63	6.0	
2	1203	34.75	1.1	1.1	284	97	90	256	258	64	6.0	
1	1208	37.77	.86	.86	285	98	91	252	254	64	5.0	
STOP	1213	40.41	LEAK	✓	.015	@15"						
5-8	1248	41.30	.75	.75	280	91	89	246	248	60	4.0	
7	1253	43.77	.81	.81	281	91	89	247	263	59	4.0	
6	1258	46.25	.70	.70	281	92	89	256	266	56	4.0	
5	1303	48.56	1.10	1.10	283	93	90	247	258	55	4.0	
4	1308	51.35	1.2	1.2	284	94	90	255	253	56	5.5	
3	1313	54.4	.93	.93	285	95	90	248	247	58	5.0	
2	1318	57.00	.71	.71	285	97	91	256	248	61	4.0	
1	1323	59.35	.98	.98	285	96	91	254	255	60		
STOP	1328	62.05	LEAK	✓	.007	@9.0"						
6-8	1330	62.367	.87	.87	276	96	93	252	257	63	5.0	
7	1335	65.0	.86	.86	281	97	92	246	255	61	5.0	
6	1340	67.65	.72	.73	281	97	92	256	264	60	5.0	
5	1345	70.15	.66	.67	283	97	92	252	247	60	4.0	
4	1350	72.43	.74	.75	284	97	92	256	258	62	5.0	
3	1355	74.95	.60	.61	284	96	92	246	257	62	5.0	
2	1400	77.15	.94	.95	285	96	92	246	244	62	5.5	
1	1405	79.88	1.1	1.2	285	99	93	248	253	63		
STOP	1410	83.16										
Avg.	—											
Check'd												

CONSOLE # _____

FILTER # _____

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP Outlet **Train** Particulate / Metals **Run No.** 3

Date 6/27/93 Time Start 0746 Time Finish 1210 Test Duration 240 min.

Duct Dimensions 11.4" X 11.4" Diameter ____ ft Initial Leak Rate .008@15 cfm

PTCF .84 DGMCF .997 NOZZLE DIA. .197 inches Final Leak Rate .007@10 cfm

Bar Press 29.3 " Hg

Static Press -11.0 " H2O Operator TJB

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
1-8	0746	96.6	.82	.82	280	76	74	244	263	68	5.0	
7	0751	99.11	.74	.74	277	76	74	247	264	62	4.0	
6	0756	101.41	.56	.55	278	79	75	252	255	56	4.0	
5	0801	103.47	.34	.33	278	80	75	246	251	57	3.0	
4	0806	105.5	.33	.33	275	86	75	247	266	57	3.0	97
3	0811	106.64	.65	.65	280	81	76	250	246	57	3.0	
2	0816	109.76	.81	.81	281	83	78	250	261	53	4.0	
1	0821	111.18	1.1	1.1	282	84	78	249	261	52	5.0	
STOP	0826	114.04		LEAK	✓	.007						
2-8	0829	114.535	.55	.55	274	85	80	246	249	57	4.0	
7	0834	116.64	.87	.86	278	.89	81	254	267	55	4.0	
6	0839	119.15	.68	.68	279	90	83	252	262	55	5.0	
5	0844	121.53	.67	.67	280	90	83	247	265	55	4.5	93
4	0849	123.88	1.1	1.1	281	91	84	251	255	55	4.5	
3	0854	126.88	.76	.76	282	92	85	244	261	56	5.5	
2	0859	129.30	.73	.73	283	93	87	245	253	58	5.0	
1	0904	131.64	.99	.99	283	92	87	244	254	59	5.0	
STOP	0909	134.355	LEAK	KV	.01@	15"						
3-8	0922	135.65	.46	.46	274	89	88	249	254	64	4.0	
7	0927	137.60	.75	.75	280	90	88	245	254	60	4.0	
6	0932	140.02	.98	.98	280	91	88	256	253	59	5.0	
5	0937	142.77	.99	1.0	282	91	87	244	247	57	5.5	
4	0942	145.68	1.3	1.4	284	92	88	255	254	59	6.0	101
3	0947	149.08	1.2	1.3	284	93	88	246	246	61	6.0	
2	0952	152.4	1.0	1.1	285	94	89	255	252	62	5.5	
1	0957	155.27	.75	.76	285	95	89	247	255	65	6.0	
STOP	1002	157.746										
Avg.	—	125.534	.9210	.9033	281.4		89.8					
Check'd												

CONSOLE # 161364

FILTER # 927

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet Train Particulate / Metals Run No. 3

Date _____ Time Start 1004 Time Finish 1210 Test Duration 126 min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ NOZZLE DIA. _____ inches Final Leak Rate _____ cfm

Bar Press _____ " Hg

Static Press _____ " H2O Operator TJB

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
1-8	1004	158.0	.56	.57	274	93	90	248	248	57	4.0	
7	1009	160.14	.88	.89	280	94	90	245	257	54	5.0	
6	1014	162.76	1.10	1.2	280	95	91	256	250	50	6.0	
5	1019	165.8	1.4	1.5	282	96	91	252	263	50	6.0	
4	1024	169.0	1.4	1.5	284	96	91	254	259	51	7.0	
3	1029	172.37	1.3	1.4	285	98	92	247	251	52	7.0	
2	1034	175.78	1.2	1.3	285	99	92	247	245	53	7.0	
1	1039	179.2	.82	.83	285	99	93	253	251	55	6.0	
STOP	1044	182.03										
5-8	1047	182.655	.65	.66	278	96	93	257	245	59	5.0	
7	1052	184.98	.87	.88	280	97	93	249	260	58	5.0	
6	1057	187.7	.78	.79	281	97	93	260	248	56	5.0	
5	1102	190.2	1.1	1.2	282	98	93	254	252	57	6.0	
4	1107	193.0	1.3	1.4	283	98	93	251	263	56	6.0	
3	1112	196.4	1.3	1.4	284	99	94	253	244	55	6.0	
2	1117	199.37	.74	.75	285	99	94	246	249	57	6.0	
1	1122	202.01	.86	.87	285	99	94	255	247	59	5.0	
STOP	1127	204.638										
6-8	1130	205.135	.95	.96	279	95	94	258	250	65	6.0	
7	1135	208.04	.89	.90	282	97	94	254	251	62	6.0	
6	1140	210.77	.75	.76	284	98	94	256	254	62	5.0	
5	1145	213.33	.69	.70	284	98	94	249	262	62	5.0	
4	1150	215.6	.59	.60	284	98	94	244	260	63	5.0	
3	1155	217.7	.56	.59	286	97	93	244	255	65	5.0	
2	1200	219.9	.88	.89	286	97	93	253	253	65	5.5	
1	1205	222.5	1.0	1.1	286	97	93	248	238	66	5.5	
STOP	1210	225.3										
Avg.	—	165.534	1.210	.9033	281.4		89.8					
Check'd												

CONSOLE # _____

FILTER # _____

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page ____ of ____

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUT **Train** Bulk Particulate-Radionuclides **Run No.** 3

Date 6/22/93 Time Start 1055 Time Finish 0619 Test Duration 619 min.

Duct Dimensions 11.4" X 11.4" Diameter ____ ft Initial Leak Rate 0.005@10 cfm

PTCF .84 DGMCF 1.005 Nozzle Dia. .197 inches Final Leak Rate .005@10 cfm

Bar Press 29.42 " Hg

Static Press -11.0 " H2O Operator

K=1.09

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	913.21	1.05	1.2	278	87	85	260	249	65	1	
	24	927.0	1.05	1.2	280	94	89	249	255	64	1	
	47	939.92	1.05	1.2	282	99	92	250	262	68	1	
	62	948.42	1.05	1.2	284	102	95	254	248	57	1	
	107	974.16	1.05	1.2	284	105	101	254	255	63	1	
	146	996.6	1.05	1.2	282	109	105	255	249	59	1	
	189	1021.45	1.05	1.2	286	104	103	252	246	59	1	
	245	1054.43	1.05	1.2	286	104	101	252	251	63	1	
30	267	1091.2	1.05	1.2	286	104	101	252	252	62	1	
	432	164.5	1.05	1.2	286	106	102	252	252	58	1	
Tm3	479.9	191.89	1.05	1.2	284	104	99	253	257	60	1	
	543.3	228.75	1.05	1.2	284	~~97~~ 98	94	256	257	56	1	
	624.5	275.50	1.05	1.2	281	98	93	253	261	58	1	
	665.7	299.15	1.05	1.2	283	97	92	253	256	57	1	
	720.5	330.40	1.05	1.2	281	94	90	253	262	53	1	
	775.8	361.70	1.05	1.2	283	94	89	253	262	54	1	
	837.2	396.50	1.05	1.2	280	91	87	250	262	54	1	
	891.5	427.20	1.05	1.2	280	92	87	252	253	53	1	
	962.1	466.97	1.05	1.2	280	93	87	251	249	55	1	
	1026.2	503.00	1.05	1.2	278	94	88	253	258	55	1	
	1081.4	537.52	1.05	1.2	279	91	86	252	255	51	1	
	1137.7	565.77	1.05	1.2	278	89	84	252	250	51	1	
6/23	0619	580.3										
Avg.	—	667.090	1.0247	1.200	2820		96.9					
Check'd												

CONSOLE # A16400

FILTER # 928

AMBIENT TEMP. 80

PROBE LENGTH 10'

LINER MATERIAL GLASS

Velocity

% Moisture

Flowrate (DSCFM)

Isokinetic (%)

REMARKS

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Particulate / Metals **Run No.** F.B.

Date 6/24/93 Time Start 11:30 Time Finish 12:00 Test Duration 30 min.

Duct Dimensions ____ X ____ Diameter ____ ft Initial Leak Rate .01@10" cfm

PTCF ____ DGMCF ____ NOZZLE DIA. ____ inches Final Leak Rate .01@10" cfm

Bar Press ____ " Hg

Static Press ____ " H2O Operator TJB/DD

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	11:02	782.95										
	4:08	790.143										
Avg.	—											
Check'd												

CONSOLE # 161364

FILTER # 907

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

Flue-Gas Sampling Log

Sponsor: DOE	Sample Run #: 1
Plant Location: Ames	Soda-Lime Trap#: 401
Date: 6/26/93	Iodated Carbon #: 401
Fuel Type: coal	Pump#: Box 2
Pollution Control: ESP	Probe#:
Sampling Point: outlet	Filter ID:

start			stop			elapsed	mean	mean
time (hh:mm)	zero (l/min)	flow (l/min)	time (hh:mm)	zero (l/min)	flow (l/min)	time (min)	zero (l/min)	flow (l/min)
0810	0.00/5"	.283	1323	0.00/1"	.243	313	0	.26
				TOTALS:				

Integrator Volume (l):
Offset Correction (l): -.021 @ Box, -.016 @ Probe
Total Integrator Volume:
CO_2 Mass Flow Correction:
Actual (dry STP) volume (l):
% O_2: 7.8
% CO_2: 11.2
% H_2O: 10%
ppm SO_2:

COMMENTS:
Initial Leak Rate = 0.00 @ 5" @ Probe
= 0.00 @ Box
Initial Vol = 118.9
Final Vol = 118.9
Final offset = -.05 @ probe

Flue-Gas Sampling Log

Sponsor: DOE	Sample Run #: 2
Plant Location: YATES	Soda-Lime Trap#: 403
Date: 6/24/93	Iodated Carbon #: 403
Fuel Type: COAL	Pump#:
Pollution Control: ESP	Probe#:
Sampling Point: OUTLET	Filter ID:

start			stop			elapsed	mean	mean
time (hh:mm)	zero (l/min)	flow (l/min)	time (hh:mm)	zero (l/min)	flow (l/min)	time (min)	zero (l/min)	flow (l/min)
0925	~~.50~~ -.48	~~.360~~	1434	-.54	.326	309		
1434		.352						
					TOTALS:			

Integrator Volume (l): 160.1
Offset Correction (l): -.048
Total Integrator Volume:
CO_2 Mass Flow Correction:
Actual (dry STP) volume (l):
% O_2: 8
% CO_2: 12
% H_2O: 10
ppm SO_2:

COMMENTS:
Initial Volume = 0.0

Flue-Gas Sampling Log

Sponsor: DOE	Sample Run #: 3
Plant Location: YATES	Soda-Lime Trap#: 409
Date: 6/25/93	Iodated Carbon #: 409
Fuel Type: COAL	Pump#:
Pollution Control: ESP	Probe#:
Sampling Point: OUTLET	Filter ID:

start			stop			elapsed	mean	mean
time (hh:mm)	zero (l/min)	flow (l/min)	time (hh:mm)	zero (l/min)	flow (l/min)	time (min)	zero (l/min)	flow (l/min)
0706	0/10"	.402	1126	0	.386	~~240~~ 260"	0	.394
				TOTALS:				

Integrator Volume (l):	0.0
Offset Correction (l):	~~-.019~~ -.049
Total Integrator Volume:	100
CO_2 Mass Flow Correction:	
Actual (dry STP) volume (l):	
% O_2:	
% CO_2:	
% H_2O:	
ppm SO_2:	

COMMENTS:

initial Vol = 0.00
final Vol = 100.0

final offset = -.050

Flue-Gas Sampling Log

Sponsor: DOE - YATES	Sample Run #: FIELD BLANK
Plant Location: ESP OUTLET	Soda-Lime Trap#: 420
Date: 6/20/93	Iodated Carbon #: 420
Fuel Type: COAL	Pump#:
Pollution Control: ESP	Probe#:
Sampling Point: ESP OUTLET	Filter ID:

start			stop			elapsed	mean	mean
time (hh:mm)	zero (l/min)	flow (l/min)	time (hh:mm)	zero (l/min)	flow (l/min)	time (min)	zero (l/min)	flow (l/min)
1300	0	0						
					TOTALS:			

Integrator Volume (l):
Offset Correction (l): -.070
Total Integrator Volume:
CO_2 Mass Flow Correction:
Actual (dry STP) volume (l):
% O_2:
% CO_2:
% H_2O:
ppm SO_2:

COMMENTS:
ADJUSTED FLOW TO .362 CFM, THEN LEAK CHECKED

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Anions **Run No.** 1

Date 6/25/93 Time Start 1015 Time Finish 1152 Test Duration 97 min.

Duct Dimensions 11'4" X 11'4" Diameter ft Initial Leak Rate <0.01 cfm

PTCF 0.84 DGMCF 0.992 Nozzle Dia. .223 inches Final Leak Rate .007@10" cfm

Bar Press 29.55 " Hg

Static Press -11 " H2O Operator MPE ITSB

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	1015	750.37	0.91	1.50	283	93	89	~~274~~	241	56	5"	
	~~1035~~											
	1041	767.51	.91	1.5	278	101	91	274	262	56	5"	
	1052	774.74	0.93	1.5	280	102	92	255	253	56	5	
	1110	786.72	0.91	1.95	283	102	93	256	248	59	5	
	1121	794.31	0.92	1.50	283	103	93	257	250	59	5	
	1139	806.74	0.92	1.55	284	104	93	258	262	60	5	
	1152	815.57										
Avg.	—	65.200	0.9514	1.5	282	98.3						
Check'd												

CONSOLE # 161403

FILTER # 722

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

* Thermocouple not correct upon insertion of probe

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet **Train** Anions **Run No.** 2

Date 6/26/93 Time Start 1113 Time Finish 1243 Test Duration 90 min.

Duct Dimensions 14'4" x 14'4" Diameter ____ ft Initial Leak Rate 0.005@10 cfm

PTCF 0.84 DGMCF 0.997 Nozzle Dia. 0.223 inches Final Leak Rate 0.003@9 cfm

Bar Press 29.42 " Hg

Static Press -1 " H2O Operator ARE/TSB K = 1.63

Travers Point	Clock Time	Dry gas meter reading ft3	^ P in H2O	^ H in H2O	Stack* Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	1113	896.70	.94	1.5	283	97	90	259	249	59	5.0	
	1125	904.9	.94	1.5	283	101	91	271	259	61	5.0	
	1136	912.1	.94	1.5	283	100	91	251	252	61	5.0	
	1147	916.07	.92	1.55	283	101	91	241	253	62	5.0	
	1156	925.8	.90	1.55	283	101	92	249	245	63	5.0	
	1207	933.3	.89	1.55	283	101	92	246	242	63	5.0	
	1230	949.9	.88	1.55	283	102	93	245	245	63	5.0	
	1240	956.1	0.90	1.55	283	104	93	251	254	63	5.0	
	1243	958.85										
Avg.	—	60.150	.9158	1.5313	2830		96.5					
Check'd												

CONSOLE # 161403

FILTER # 934

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS

C-70 * stack T assumed constant at single point

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location Outlet Train Anions Run No. 3

Date 6/27/93 Time Start 0915 Time Finish 1038 Test Duration 83 min.

Duct Dimensions 11.4 X 11.4 Diameter ____ ft Initial Leak Rate .01@13" cfm

PTCF .84 DGMCF .992 Nozzle Dia. .229 inches Final Leak Rate .004@10" cfm

Bar Press 29.3 " Hg

Static Press -1.0 " H2O Operator TJB

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0915	47.70	.87	1.6	280	101	94	247	250	65	5.0	
	0920	51.28	.87	1.6	280	103	94	247	256	59	5.0	
	0930	58.38	.87	1.6	280	106	95	258	252	59	5.0	
	0945	69.04	.87	1.6	280	106	95	253	260	58	5.0	
	1015	91.28	.87	1.6	2	108	97	253	246	59	5.0	
TB	1020					98	98 82	251	252	51	TB	
	1027	100.1	.87	1.6	280	108	97	255	251	65	5.0	
	1038	108.381										
Avg.	—	60.611	.9327	1.600	280.0		99.7					
Check'd												

CONSOLE # 161403

FILTER # 901

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUT **Train** Anions **Run No.** F.B.

Date 6/24/93 Time Start 1430 Time Finish _____ Test Duration _____ min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ Nozzle Dia. _____ inches Final Leak Rate _____ cfm

Bar Press _____ " Hg

Static Press _____ " H2O Operator _____

Travers Point	Clock Time	Dry gas meter reading ft3	^ P in H2O	^ H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
		94.100										
		94.26										
Avg.	—											
Check'd												

CONSOLE # A161-364

FILTER # _____

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

Plant Name 6-25-93 ~~ATU~~ **Plant Yates Station Boiler No. 1**

Sampling Location ESP outlet **Train** **Ammonia/Hydrogen Cyanide** **Run No.** 1

Date 6/29/93 Time Start 0741 Time Finish 0930 Test Duration 109 min.

Duct Dimensions 11'4" X 11'4" Diameter ____ ft Initial Leak Rate .01@12" cfm

PTCF .84 DGMCF .992 Nozzle Dia. .223 inches Final Leak Rate 0.015@15" cfm

Bar Press 29.55 " Hg

Static Press 11.0 " H2O Operator TJB/APE k=1.03

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0741	674.000	.95	1.55	278	75	74	267	271	63	8.0	
	0810	693.5	.95	1.55	280	74	80	258	265	60	8.0	
	0816	697.43	.95	1.50	270	95	81	254	262	58	8.0	
	0825	703.5	~~.89~~ .95 TJB	1.50	280	95	83	266	249	56	8.0	
	0836	710.7	.95	1.58	280	95	83	265	254	56	8.0	
	0855	723.34	0.91	1.55	282	96	85	257	246	56	8.0	
	0914	736.40	0.90	1.60	278	99	87	257	242	59	8.0	
	~~0920~~ 0930	747.525										
			√ΔP									
Avg.	—	73.525	0.9680	1.547	280	89.3						
Check'd	RC	73.525										

CONSOLE # 161403

FILTER # ____

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

SOURCE SAMPLING FIELD DATA SHEET

Page 1 of 1

Plant Name 6-93 DSV Plant Yates Station Boiler No. 1

Sampling Location 06 Duct Train Ammonia/Hydrogen Cyanide Run No. 2

Date 6/25/93 Time Start 0930 Time Finish 1104 Test Duration 95 min.

Duct Dimensions 11.4 X 11.4 Diameter ft Initial Leak Rate .007 @ 12" cfm

PTCF -84 DGMCF 1.859 Nozzle Dia. .223 inches Final Leak Rate 0.006 @ 12" cfm

Bar Press 29.92 " Hg 0.992 DSV

Static Press -11 " H2O Operator AE

K=1.63 @ 75°Tm = 1.69 @ 9

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	830.3	0.92	1.50	276	78	76	256	239	45	7	
	10	836.99	0.88	1.45	278	86	78	254	250	44	6.5	
	20	843.60	0.87	1.45	278	89	79	255	245	46	6.5	
	30.7	850.66	0.88	1.45	280	92	81	258	245	46	6.5	
	40.3	856.99	0.85	1.45	280	94	82	257	239	48	6.5	
	51.8	864.57	0.95	1.50	276	96	84	257	240	48	6.75	
	57.8	868.63	1.0	1.65	279	97	85	258	253	49	7.0	
	67.0	875.16	0.95	1.55	283	99	87	258	241	51	7.0	
	75.4	881.05	0.96	1.60	284	100	88	259	244	51	7.0	
	87.9	889.78	0.92	1.60	278	103	90	257	251	50	7.0	
	94	894.0	0.94	1.50								
	94.7	894.45										
Avg.	—	64.50	0.9589	1.5182	279.4		88.2					
Check'd												

CONSOLE # 161403

FILTER # 934

AMBIENT TEMP. /

PROBE LENGTH

LINER MATERIAL

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

REMARKS

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP Outlet **Train** Ammonia/Hydrogen Cyanide **Run No.** 3

Date 6/27/93 Time Start 0725 Time Finish 0856 Test Duration 91 min.

Duct Dimensions 11.4" X 11.4" Diameter ___ ft Initial Leak Rate .01 @ 10" cfm

PTCF .84 DGMCF .992 Nozzle Dia. TB .223 .229 inches Final Leak Rate .007 @ 12" cfm

Bar Press 29.3 " Hg

Static Press -11.0 " H2O Operator TJB K 1.85

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0725	983.0	.89	1.6	280	81	77	254	263	68	6.0	
	0733	988.45	.89	1.6	280	90	79	253	260	59	6.0	
	0741	993.96	.89	1.6	280	96	81	262	258	54	6.0	
	0753	1002.28	.89	1.6	277	99	84	253	255	53	6.0	
	0803	1009.26	.85	1.6	278	101	87	254	258	53	6.0	
	0818	1019.65	.89	1.6	279	102	89	255	249	54	6.5	
	0830	1028.04	.89	1.6	280	106	92	256	257	57	6.5	
	0845	1036.58	.89	1.6	280	107	93	258	253	57		
	0856	1046.443										
Avg.	—	62.443	.9454	1.600	279.3		91.5					
Check'd												

CONSOLE # 161403

FILTER # 901

AMBIENT TEMP. ___

PROBE LENGTH ___

LINER MATERIAL ___

Velocity ___

% Moisture ___

Flowrate (DSCFM) ___

Isokinetic (%) ___

REMARKS Broke Nozzle before run switch to 9.229

SOURCE SAMPLING FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP Outlet **Train** Ammonia/Hydrogen Cyanide **Run No.** F. B.

Date 6-24-93 Time Start _____ Time Finish _____ Test Duration _____ min.

Duct Dimensions _____ X _____ Diameter _____ ft Initial Leak Rate _____ cfm

PTCF _____ DGMCF _____ Nozzle Dia. _____ inches Final Leak Rate _____ cfm

Bar Press _____ " Hg

Static Press _____ " H2O Operator Doelle

Travers Point	Clock Time	Dry gas meter reading ft3	^ P in H2O	^ H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	1325	90183										
		90.380										
Avg.	—											
Check'd												

CONSOLE # A161364

FILTER # 654

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity _____

% Moisture _____

Flowrate (DSCFM) _____

Isokinetic (%) _____

REMARKS _____

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location OUTLET **Train** Bulk Particulate-Radionuclides **Run No.** 1

Date 6/24/93 Time Start 1040 Time Finish ~0700 Test Duration 1198 ** min.

Duct Dimensions 11'4" X 11'4" Diameter — ft Initial Leak Rate <.001 cfm

PTCF .184 DGMCF 1.005 Nozzle Dia. .197 inches Final Leak Rate 0.009 cfm

Bar Press 29.53 " Hg

Static Press -11 " H2O Operator PPE

Travers Point	Clock Time (Min)	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	509.48	1.20	1.26	283	97	89	257	272	91	5.25	
	22.6	517.92	1.20	1.20	284	102	94	259	275	92	5.5	
	46.8	532.23	1.10	1.15	286	107	99	255	281	72	5.25	
	63.0	541.725	1.20	1.25	285	108	101	256	278	74	5.25	
	88.9	557.19	1.25	1.30	288	113	106	258	277	77	5.5	
	118.5	575.05	1.20	1.32	284	106	102	271	253	70	5.5	
	202	625.40	1.2	1.3	287	112	104	252	260	62	6	
	264	662.61	1.2	1.3	288	115	109	253	281	67	6	
	306.4	688.295	1.20	1.23	289	108	103	253	266	63	5.5	
*	329.0	702.5										
*	329.0	702.5	1.2	1.23								
stop	409.0	748.9										
start	409.3	749.45	1.2	1.2	282	88	80	257	254	49	2.5	
	409.4											
	412.4	765.80	1.25	1.35	283	90	82	255	274	69		
→	461.0	795.07	1.25	1.35	277	91	86	251	275	64	2.5	
	522.0	831.80	1.25	1.35	284	88	83	253	266	62	2.5	
	592.4	873.94	1.25	1.35	283	92	85	253	270	66	2.5	
	646.6	906.48	1.25	1.35	283	93	86	252	271	68	2.5	
	729.5	955.17	1.25	1.35	282	91	84	254	272	66	2.5	
	798.3	997.07	1.25	1.35	279	94	87	251	282	66	2.5	
	842.4	1024.10	1.25	1.35	279	93	86	251	272	58	2.5	
	913.5	67.13	1.25	1.35	280	94	86	252	272	58	2.5	
	971.9	103.91	1.25	1.35	279	94	87	252	271	59	2.5	
	1027.9	138.97	1.25	1.35	281	96	88	253	271	62	2.5	
	1077.2	169.17	1.25	1.35	279	94	87	252	274	58	2.5	
19.4 hr	1137.1	206.40	1.20	1.25	279	93	86	252	276	57	2.5	
	1166.7	223.54										
Avg.	—											
Check'd												

CONSOLE # A161400
FILTER # #909
AMBIENT TEMP. 90
PROBE LENGTH 8'
LINER MATERIAL

Velocity
% Moisture
Flowrate (DSCFM)
Isokinetic (%)

REMARKS Lost Power 1605 restarted @ 1610 Due train stop - stopped at 1730 to recharge impingers ** timer was off for 31 min while ...

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page 1 of ____

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUTLET **Train** Bulk Particulate-Radionuclides **Run No.** 2

Date 6/26/93 Time Start 1050 Time Finish 0640 Test Duration ____ min.

Duct Dimensions 11'4" X 11'4" Diameter ____ ft Initial Leak Rate 0.005@11" cfm

PTCF .84 DGMCF 1.005 Nozzle Dia. .197 inches Final Leak Rate 0.003@5 cfm

Bar Press 25.55 " Hg

Static Press -11 " H2O Operator ASSORTED MISFITS K=1.06

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
1050	1050	243.171	1.0	1.1	283	83	84	258	280	70	5	
	15"	252.04	1.0	1.1	283	87	84	245	270	72	5	
	59"	275.96	1.0	1.1	284	96	89	254	282	70	5	
	104	300.44	1.05	1.2	284	97	92	254	275	68	5	
	124.4	312.23	1.1	1.35	285	100	94	254	284	71	4.5	
	150	327.64	1.0	1.1	285	102	96	251	270	75	5	
	211	362.32	1.0	1.1	286	102	98	252	276	69	4	
	265.1	392.19	1.05	1.1	286	105	100	253	255	71	4	
↓	312	417.51										
	3120	417.6	1.0	1.1	287	103	100	253	261	68	2.0	
1720	390.	458.20	1.0	1.1	288	112	105	252	249	69	4.0	
TM5 →	474.5	508.98	1.0	1.1	284	107	101	253	255	68	4.0	
	536.5	544.95	1.0	1.1	285	101	96	253	260	65	4.0	
	606.0	584.01	1.0	1.1	280	99	93	252	253	61	4.0	
	651.5	609.60	1.0	1.1	280	99	93	253	251	63	4.0	
	653.6	632.72	1.0	1.1	284	97	92	252	260	58	4.0	
	745.2	661.67	1.0	1.1	282	93	88	252	259	55	4.0	
	799.0	691.64	1.0	1.1	282	91	86	252	258	57	4.0	
	887.3	739.44	1.0	1.1	280	94	88	253	264	61	4.0	
	940.50	768.28	1.0	1.1	279	92	87	252	259	57	4.0	
	1031.4	813.06	1.0	1.1	279	89	84	253	250	63	4.0	
	1074.2	841.93	1.0	1.1	279	88	83	253	259	56	4.5	
	1121.3	866.48	1.0	1.1	279	91	85	253	252	55	4.5	
	1170	894.38	1.0	1.1	280	90	85	252	261	55	5	
	1182.4	901.34										
Avg.	—	658.079	1.0092	1.1	282.8		93.9					
Check'd												

CONSOLE # A161400 NE

FILTER # 275925

AMBIENT TEMP. ____

PROBE LENGTH 1.0' GLASS

LINER MATERIAL GLASS

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

REMARKS Stop to Empty water From Imp Si gell OK

C-78 Note: some ash seen downstream of filter in hotbox / First half of test 1050 to 1720
Second half of test 1720-0640

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page ____ of ____

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUT **Train** Bulk Particulate-Radionuclides **Run No.** 3

Date 6/22/93 Time Start 1055 Time Finish 0619 Test Duration 619 min.

Duct Dimensions 11.4" X 11.4" Diameter ____ ft Initial Leak Rate 0.005@10 cfm

PTCF .84 DGMCF 1.005 Nozzle Dia. .197 inches Final Leak Rate .005@10 cfm

Bar Press 29.42 " Hg

Static Press -11.0 " H2O Operator [signature] K=1.09

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	913.21	1.05	1.2	278	87	85	260	249	65	1	
	24	927.0	1.05	1.2	280	94	89	249	255	64	1	
	47	939.92	1.05	1.2	282	99	92	250	262	68	1	
	62	948.42	1.05	1.2	284	102	95	254	248	57	1	
	107	974.16	1.05	1.2	284	105	101	254	255	63	1	
	146	996.6	1.05	1.2	282	109	105	255	249	59	1	
	189	1021.45	1.05	1.2	286	104	103	252	246	59	1	
	245	1054.43	1.05	1.2	286	104	101	252	251	63	1	
307	267	1091.2	1.05	1.2	286	104	101	252	252	62	1	
	432	164.5	1.05	1.2	286	106	102	252	252	58	1	
Tmg	479.9	191.89	1.05	1.2	284	104	99	253	257	60	1	
	543.3	228.75	1.05	1.2	284	98	94	256	257	56	1	
	604.5	275.50	1.05	1.2	281	98	93	253	261	58	1	
	665.7	299.15	1.05	1.2	283	97	92	253	256	57	1	
	720.5	330.40	1.05	1.2	281	94	90	253	262	53	1	
	775.8	361.70	1.05	1.2	283	94	89	253	262	54	1	
	837.2	396.50	1.05	1.2	281	91	87	250	262	54	1	
	891.5	427.20	1.05	1.2	280	92	87	252	253	53	1	
	960.1	466.97	1.05	1.2	280	93	87	251	249	55	1	
	1026.2	503.00	1.05	1.2	278	94	88	253	258	55	1	
	1081.4	537.52	1.05	1.2	279	91	86	252	255	51	1	
	1137.7	565.77	1.05	1.2	278	89	84	252	250	51	1	
6/23	0619	580.3										
Avg.	—	667.090	1.0247	1.200	282.0		96.9					
Check'd												

CONSOLE # A161400

FILTER # 928

AMBIENT TEMP. 80

PROBE LENGTH 10'

LINER MATERIAL GLASS

Velocity

% Moisture

Flowrate (DSCFM)

Isokinetic (%)

REMARKS

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page 1 of 1

Plant Name Plant Yates Station Boiler No. 1

Sampling Location OUTLET   **Train** Bulk Particulate-Ex. Metals   **Run No.** 1

Date 6/24/93   Time Start ______   Time Finish 0700 6/25   Test Duration 1101 ** min.

Duct Dimensions 11'4" x 11'4"   Diameter ______ ft   Initial Leak Rate 0.015 cfm

PTCF .84   DGMCF .998   Nozzle Dia. .223 .230 inches   Final Leak Rate 0.014 cfm   1.98

Bar Press 29.53 " Hg

Static Press -11 " H2O   Operator ______

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	463.0	1.30	2.60	287	99	91	257	252	67	12	
	9.1	470.67	1.30	2.58	288	100	92	256	[illegible]	72	12	
	41.3	497.85	1.30	2.61	285	102	94	259	248	84	11.8	
	121.9	566.92	1.3	2.6	282	109	97	259	253	70	12	
	184	620.24	1.3	2.6	288	114	102	261	250	70	12	
	226.1	656.70	1.15	2.65	289	106	97	261	251	53	11.5	
*	253	680.1										
	253	680.1	1.15	2.65								
	317.6	734.0	1.10	2.2	282	89	81	259	249	49	10.5	
stop	333.7	745.75										
start	344.5	746.3										
	358.6	757.75	1.20	2.45	283	89	80	258	249	50	7.5	
TMD?	408.0	798.16	1.20	2.45	284	93	85	257	257	56	7.5	
	465.9	845.30	1.20	2.45	283	91	82	257	249	54	7.5	
	539.0	905.08	1.20	2.45	281	93	83	258	252	49	7.5	
	589.5	946.30	1.20	2.45	280	94	84	258	250	52	7.5	
	675.7	1016.18	1.20	2.45	279	91	80	259	251	52	8.0	
	742.1	70.38	1.20	2.45	278	93	83	258	250	52	8.0	
	788.5	108.30	1.20	2.45	278	91	81	260	250	46	8.0	
	857.6	164.42	1.20	2.45	279	92	82	258	250	47	8.0	
	917.9	213.46	1.20	2.45	279	91	81	259	250	48	8.0	
	971.9	257.19	1.20	2.45	279	93	83	259	251	50	8.0	
	1023.5	298.82	1.20	2.45	279	92	82	257	251	45	8.0	
11.8hr	1079.3	343.67	1.15	2.35	279	91	82	257	250	45	8.0	
	1111.6	369.5										
Avg.	—		√ΔP									
Check'd		906.5	1.1008	2.49	282	90.9						

rotor re. (margin note)

CONSOLE # A161395

FILTER # ~~915~~ 929

AMBIENT TEMP. 90

PROBE LENGTH 10'

LINER MATERIAL ______

Velocity

% Moisture

Flowrate (DSCFM)

Isokinetic (%)

REMARKS Nozzle ID 009 .230 .230 .230

Lost Power @ 1610 Due to rain restart @ 1620

stop - pulled out train to change impingers

** subtract 10.8 min as timer was [illegible]

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page 1 of ____

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUT Train Bulk Particulate-Ex. Metals Run No. 2

Date 6/26/93 Time Start 1040 Time Finish 0636 6/27 Test Duration ____ min.

Duct Dimensions 11.4 x 11.4 Diameter ____ ft Initial Leak Rate 0.009@14 cfm

PTCF .84 DGMCF 0.998 Nozzle Dia. .229 inches Final Leak Rate 0.006@7 cfm

Bar Press 29.55 " Hg

Static Press -11 " H2O Operator Assorted Misfits K=1.9

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	1040	390.40	1.2	2.3	282	99	77	278	254	63	8	
	22"	407.91	1.2	2.3	283	92	81	269	253	62	8	
	70"	446.06	1.2	2.3	284	100	88	257	254	64	8	
	116"	483.1	1.2	2.3	284	101	91	260	252	53	8	
	132.5	496.2	1.2	2.3	285	103	97	259	250	54	8	
	162	520.08	1.2	2.3	286	104	94	262	253	56	8	
	223	569.59	1.2	2.3	286	105	95	259	253	50	8	
	276.6	612.07	1.25	2.35	286	108	99	259	250	53	8	
STOP	316.0	644.78										
START	00.00	644.92	1.2	2.3	286	104	97	261	253	54	5	
1725	00.00	716.50										
TMD	80.9	783.04	1.2	2.3	286	106	97	261	250	57	5	
	143.0	830.90	1.2	2.3	284	101	94	255	252	52	5	
	212.5	885.76	1.2	2.3	281	99	91	260	250	49	5	
	258.0	921.91	1.2	2.3	281	98	90	260	251	51	5	
	300.0	955.15	1.2	2.3	284	98	89	~~260~~ 249		47	5	
	351.8	996.15	1.2	2.3	281	95	86	259	251	48	5	
	405.5	1038.30	1.2	2.3	280	92	83	259	250	48	6	
	493.7	1108.51	1.2	2.3	279	95	85	258	251	50	6	
	546.9	1150.79	1.2	2.3	278	93	84	257	250	47	6	
	628.5	1214.84	1.2	2.3	279	90	82	257	250	50	6	
	680.4	1255.44	1.2	2.3	279	89	80	257	250	50	6	
	727.6	1291.96	1.2	2.3	280	92	82	259	249	44	6.5	
	778	1232.13	1.2	2.3	280	92	83	258	255	44	7	
	787.1	1339.29										
Avg.	—	948.750	1.225	2.300	282.5	92.6						
Check'd												

CONSOLE # A16135

FILTER # 904

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS Stopped 1600 removed spent Si.Gel

SOURCE SAMPLING FIELD DATA SHEET

Page ____ of ____

Plant Name Plant Yates Station Boiler No. 1 Boik

Sampling Location ESP Outlet **Train** ~~Particulate / Metals~~ **Run No.** 3

Date 6/26/93 Time Start 1137 Time Finish 0621 Test Duration 1125 min.

Duct Dimensions 11'4" X 11'4" Diameter ____ ft Initial Leak Rate .010@10" cfm

PTCF .084 DGMCF 0.999 NOZZLE DIA. .229 inches Final Leak Rate .010@6" cfm

Bar Press 29.42 " Hg

Static Press -11 " H2O Operator DD/TM/TJB K=1.97

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	347.80	.97	1.9	282	87	82	274	253	62	4	
	20	361.15	97	1.9	283	94	85	265	253	47	4	
	66	394.7	.97	1.9	286	104	96	250	253	53	4	
	106	424.01	.97	1.9	286	109	102	255	253	49	4	
	147	454.32	.97	1.9	286	106	101	259	249	54	4	
	203	495.51	.95	1.9	288	106	99	259	249	53	5	
	268	543.4	.97	1.9	290	103	96	254	254	48	5	
	394	635.3	.97	1.9	292	104	98	259	250	50	5	
TMD	441.7	669.83	097	1.9	289	102	95	260	249	50	5	
	502.6	713.70	0.97	1.9	285	96	89	255	249	57	5	
	583.7	772.26	0.97	1.9	284	97	89	257	249	48	5	
	624.9	801.86	0.97	1.9	284	97	89	259	250	47	5	
	679.6	840.90	0.97	1.9	284	94	87	258	249	44	5	
	735.0	880.77	0.97	1.9	284	94	87	259	249	44	5	
	796.4	924.70	0.97	1.9	282	92	85	259	249	46	5	
	850.8	963.90	0.97	1.9	280	92	84	259	249	45	5	
	921.4	1014.22	0.97	1.9	280	92	85	260	249	46	5	
	985.5	59.70	0.97	1.9	278	92	85	257	250	45	5	
	1040.7	99.50	0.97	1.9	278	91	84	257	249	42	5	
	1097.0	139.63	0.97	1.9	278	89	82	258	247	42	5	
0621	1125	159.605										
Avg.	—	812.605	.9940	1.900	285		94.5					
Check'd												

CONSOLE # A161395

FILTER # 925 QUARTZ

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page 1 of ____

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUTLET **Train** Size Fract. Particulate **Run No.** 82

Date 2/26/93 Time Start 1130 Time Finish 0636 2/27 Test Duration 1109 min.

Duct Dimensions 11'4" X 11'4" Diameter _____ ft Initial Leak Rate .005@6 cfm

PTCF .84 DGMCF 1.007 Nozzle Dia. .211 inches Final Leak Rate _____ cfm

Bar Press 29.55 " Hg

Static Press -11 " H2O Operator [signature] K=1.6 TB 1.3

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	578.850	1.1	1.7	277	80	70			70	2	
	24	586.28	1.1	1.7	279	92	81			70	2	
			1.0	1.6	279	94	84			68	2	
	64.6	613.32	1.1	1.6	279	97	89			72	2	7
	97	635.29	1.0	1.6	280	100	93			75	2	
150	~~145.5~~	676.05	1.0	1.6	287	101	85			67	2	
	210.5	712.95	0.96	1.6	286	104	97			70	2	
	235.0	729.7	1.0	1.3	280	104	97			69	2	
	268	749.2	.98	1.3	281	104	99			70	2	
1715	338	790.25	.96	1.3	285	104	99			66	2	
TM9 >	426.5	839.85	0.96	1.3	288	100	95			65	2	
	488.4	878.60	0.96	1.3	281	98	93			58	2	
	557.8	921.86	0.96	1.3	276	97	92			58	2	
	603.4	950.60	0.96	1.3	280	95	90			55	2	
	645.5	976.35	0.96	1.3	278	95	90			55	2	
	697.3	1067.95	0.96	1.3	275	92	87			54	2	
	751.1	1041.10	0.96	1.3	274	89	85			53	2	
	838.7	1094.14	0.96	1.3	278	91	86			54	2	
*	~~skipped~~ 892.5	1126.72	0.96	1.3	272	91	85			53	2	
	951.2	1161.42	0.96	1.3	274	86	80			48	2	
	1003.7	1193.35	0.96	1.3	273	86	81			49	2	
	1050.4	1221.52	0.96	1.3	274	88	82			45	2	
	1090.0	1245.95	0.94	1.3	277	89	84			49	2	
	1103	1253.08	.94	1.3	278	88	83			46	2	
	1108.7	1256.47										
Avg.	—	687.620	1.38"	1.450	278.7		91.3					
Check'd			1.99542									

CONSOLE # A161396

FILTER # 1258 (Thimble)

AMBIENT TEMP. _____

PROBE LENGTH _____

LINER MATERIAL _____

Velocity	
% Moisture	
Flowrate (DSCFM)	
Isokinetic (%)	

REMARKS ΔH@ 1.775

* empty silica gel

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Page 1 of 1 KSM

Plant Name Plant Yates Station Boiler No. 1

Sampling Location OUTLET **Train** Size Fract. Particulate **Run No.** 4

Date 6/24/93 Time Start 0740 Time Finish ~~0700~~ 425 Test Duration 1375.8 min.

Duct Dimensions 11'4" X 11'4" Diameter ____ ft Initial Leak Rate 0.012@12 cfm

PTCF .84 DGMCF 1.007 Nozzle Dia. .211 inches Final Leak Rate ____ cfm K ~ 1.30 @ 95/275

Bar Press 29.53 " Hg

Static Press -11 " H2O Operator Drake, et al.

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp.	Last Impinger	Vacuum in. Hg	
	0	715.378	.78	1.288	278	81	78			70	2	
	9	720.37	.95	1.413	278	83	78			66	2	
	40	739.96	1.0	1.84	279	94	85			68	2	
	64	754.77	1.0	1.4	281	95	88			69	2	
	90	770.55	1.0	1.3	282	100	92			65	2	
	131	795.60	1.0	1.3	283	101	95			64	2	
	163	815.04	1.0	1.3	284	104	97			67	2	
	188	831.18	1.0	1.3	284	102	96			59	2	
	211	846.38	.95	1.3	285	104	96			61	2	
	254	872.89	.94	1.2	286	102	96			68	2	
	290	894.6	1.0	1.4	283	96	93			57	2.0	
	377	948.25	1.0	1.4	287	100	93			62	2	
	439	989.68	1.0	1.4	290	105	99			65	2	
	~~[illegible]~~	~~[illegible]~~										
	624.8	1107.82	.93	1.4	281	87	80			55	2	
	674.0	1138.68	0.93	1.4	282	89	83			55	2	
	729.4	173.00	0.93	1.4	282	89	82			56	2	
	801.0	217.31	0.93	1.4	282	90	83			57	2.5	
	857.1	251.94	0.93	1.4	279	89	83			62	2.5	
* stop 23:22	941.6	304.910										
start 23:26	941.6	305.125	0.93	1.4	279	84	79			61	2.5	
	1003.0	344.17	0.93	1.4	277	90	82			64	2.5	
	1049.0	372.93	0.86	1.3	279	88	81			54	2.5	
	1118.2	416.54	0.86	1.3	278	89	82			52	2.5	
	1177.5	451.70	0.86	1.3	278	88	81			51	2.5	
	1232.5	484.10	0.86	1.3	278	90	83			57	2.5	
	1283.0	513.84	0.86	1.3	278	89	83			50	2.5	
23.5hr	1353.3	554.81	0.84	1.2	278	88	82			51	2.5	
Avg.	1372.8	567.723										
Check'd		852.132	.9581	1.3455	281.1		89.8					

CONSOLE # A 161396

FILTER # 1251 (Thimble)

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS * The 9) empty imp., leak check through glass were 0.002@15"

SOURCE SAMPLING FIELD DATA SHEET

ESP OUTLET

Plant Name Plant Yates Station Boiler No. 1

Sampling Location ESP OUTLET **Train** Size Fract. Particulate **Run No.** 3

Date 6/26/93 Time Start 1218 Time Finish 0627 Test Duration 1090 min.

Duct Dimensions 11'4 X 11'4 Diameter ____ ft Initial Leak Rate 0.005 @ 6" cfm

PTCF .84 DGMCF 1.007 Nozzle Dia. .21 inches Final Leak Rate ____ cfm

Bar Press 29.42 " Hg

Static Press -11.0 " H2O Operator [signature]

R = 1.013

13
13
39
13

Travers Point	Clock Time	Dry gas meter reading ft3	^P in H2O	^H in H2O	Stack Temp. F	Dry gas meter temp. Inlet	Dry gas meter temp. Outlet	Hot box Temp.	Probe Temp	Last Impinger	Vacuum in. Hg	
	0	258.76	1.2	1.6	284	85	82	-	96		3	
	26	274.7	1.2	1.6	282	92	85				3	
	63	300.7	1.2	1.6	282	100	92		128	48	3	
	105	330.67	1.2	1.6	284	101	95			59	3	
	161	370.1	1.3	1.7	283	104	99			55	3	
	225	415.7	1.3	1.7	286	103	79		124	55	3	
	350	503.1	1.2	1.6	288	102	97		127	51	2	
Tmg	397.7	534.78	1.2	1.6	286	100	94		127	56	2	
	461.0	578.12	1.2	1.6	287	94	89		125	52	2	
	542.0	632.50	1.2	1.6	281	96	90		129	50	2	
	583.4	660.33	1.2	1.6	280	97	91		129	49	2	
	637.7	696.57	1.1	1.5	281	96	90		127	47	2	
	693.5	732.30	1.1	1.5	281	96	90		126	49	2	
	754.5	771.07	1.0	1.4	278	93	88		125	49	2	
	809.1	803.88	1.0	1.4	272	93	88		121	49	2	
	879.8	846.50	1.0	1.4	276	92	87		130	49	2	
	943.9	884.59	1.0	1.4	274	93	87		122	48	2	
	999.1	917.17	1.0	1.4	274	91	86		122	45	2	
	1055.5	950.42	1.0	1.4	274	89	84		125	47	2	
0627	1090	970.557										
Avg.	—											
Check'd												

CONSOLE # A161394

FILTER # 1255 (Thimble)

AMBIENT TEMP. ____

PROBE LENGTH ____

LINER MATERIAL ____

Velocity ____

% Moisture ____

Flowrate (DSCFM) ____

Isokinetic (%) ____

REMARKS ____

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location OUTLET

Run No. 1

Date 6/21/93 Operator TJB

Sorbing Reagents: (CO2) (O2) (CO)

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0	6.0	6.0	19.4	13.4		
2	0	6.2	6.2	19.0	12.8		
3	0	6.6	6.6	19.6	13.0		

Averaged Results: % CO2 6.3 * % O2 13.1 *

% CO

Y-253

Dry Molecular Weight, MW (dry) =

Run # 1 Train orsat ESP Inlet / ESP Outlet / Stack

Component bag

=0.44 (%CO2) +0.32 (%O2)

Date 6-21-93 Time Smplr TJB

Lab on site Analysis CO2 O2

= + + Tare Wt. Final Wt.

#'s NOT REALISTIC — LEAK IN SAMPLING SYSTEM

WAW

ASSUME $O_2 = 8.0$

$CO_2 = 11.1$

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location ESP Outlet

Run No. 2

Date 6/22/93 Operator TJB / TMP

Sorbing Reagents: (CO2) ✓ (O2) ✓ (CO)

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0.0	11.2	11.2	19.0	7.8		
2	0.0	11.1	11.1	19.0	7.9		

Averaged Results: % CO2 11.2 % O2 7.9

% CO % N2 80.9

Dry Molecular Weight, MW (dry) =

=0.44 (%CO2) +0.32 (%O2) +0.28 (%CO + % N2)

= + +

Y-254

Run # 2 Train orsat ESP Inlet / (ESP Outlet) / Stack

Component bag

Date 6-22-93 Time Smplr TJB

Lab on site Analysis

Tare Wt. Final Wt.

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location ESP outlet

Run No. 3

Date 6/23/93 Operator TMP

Sorbing Reagents: (CO2) ✓ (O2) ✓ (CO).

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0.0	10.6	10.6	19.0	8.4		
2	0.0	10.6	10.6	19.1	8.5		

Averaged Results: % CO2 10.6 % O2 8.5

% CO % N2 80.9

Dry Molecular Weight, MW (dry) =

=0.44 (%CO2) +0.32 (%O2) +0.28 (%CO + % N2)

= + Y-255

Run # 3 Train ORSAT ESP Inlet ESP Outlet Stack

Component bag

Date 6-23-93 Time Smplr JJB

Lab onsite Analysis CO_2 O_2

Tare Wt. Final Wt.

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location ESP Outlet

Run No. Run 2-1 Run 1 phase 2

Date 06-25-93 Operator DJV

Sorbing Reagents: (CO2) (O2) (CO)

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0.0	11.2	11.2	18.8	7.6		
2	0.0	11.2	11.2	18.8	7.6		

Averaged Results: % CO2 11.2 % O2 7.6

% CO % N2

Dry Molecular Weight, MW (dry) =

=0.44 (%CO2) +0.32 (%O2) +0.28 (%CO + % N2)

=_____ + _____ +

Y-329

Run # 1 Train Orsat ESP Inlet (ESP Outlet) Stack

Component bag

Date 6-25-93 Time 1540 Smplr TJB

Lab on site Analysis CO2 O2

Tare WT(g) Final Wt(g)

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location ESP Outlet

Run No. phase 2 run 2

Date 6/26/93 Operator TMP

Sorbing Reagents: (CO2) ✓ (O2) ✓ (CO)

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0.0	11.0	11.0	18.6	7.6		
2	0.0	11.2	11.2	18.6	7.4		

Averaged Results: % CO2 11.1 % O2 7.5

% CO % N2

Dry Molecular Weight, MW (dry) =

=0.44 (%CO2) +0.32 (%O2) +0.28

=_____ + _____ + _____

Y-406

Run # 2 Train orsat

ESP Inlet
ESP Outlet
Stack

Component Phase 2 - Bag

Date 6-26-93 Time 1445 Smplr TJB

Lab onsite Analysis CO_2 O_2

Tare WT(g) Nc Final Wt(g) Na

ORSAT DATA SHEET

Plant Plant Yates Station Boiler No. 1 Comments

Location ESP Outlet

Run No. 2-3

Date 6/27/93 Operator TMP

Sorbing Reagents: (CO2) (O2) (CO)

Replicate Number	Original Volume Reading	(CO2) Reading 2 (ml)	(CO2) Volume (2-1) (ml)	(O2) Reading 3 (ml)	(O2) Volume (3-2) (ml)	(CO) Reading 4 (ml)	(CO) Volume (4-3) (ml)
1	0.0	11.4	11.4	19.0	7.6		
2	0.0	11.4	11.4	19.0	7.6		

Averaged Results: % CO2 11.4 % O2 7.6

% CO % N2

Dry Molecular Weight, MW (dry) =

=0.44 (%CO2) +0.32 (%O2) +0.28 (%

=_____ + _____ + _____

Y-452

Run # 2-3 Train ORSAT

Component ORSAT

Date 6/27/93 Time 1300 Smplr TJB

Lab On site Analysis O2/CO2

Tare WT(g) — Final Wt(g) —

ESP Inlet
ESP Outlet
Stack

TRAVERSE FIELD DATA SHEET

Plant Name Plant Yates Station Boiler No1

Sampling Location ESP OUTLET

Date 06-19-93

Operator RVW / JWM

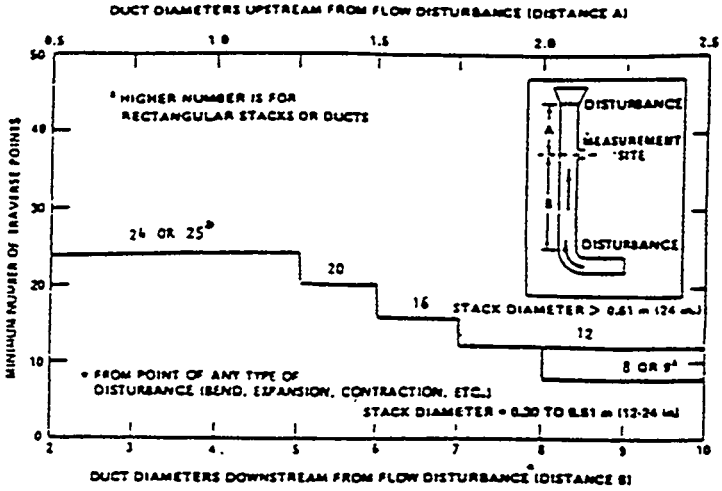
Stack Diameter 11'4" x 11'4"

Sample Port Diameter 4"

Sample Port Depth 18"

Distance Upstream

Distance downstream



Traverse Point Number	Number Traverse Points On A Diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7				89.5	77.4	64.4	36.6	28.3	23.6	20.4	18.0	16.1
8				96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9					91.8	82.3	73.1	62.5	38.2	30.6	26.2	23.0
10					97.4	88.2	79.9	71.7	61.8	38.8	31.5	27.2
11						93.3	85.4	78.0	70.4	61.2	38.3	32.3
12						97.9	90.1	83.1	76.4	68.4	60.7	39.8
13							94.3	87.5	81.2	75.0	68.5	60.2
14							98.2	91.5	85.4	79.6	73.8	67.7
15								95.1	89.1	83.5	78.2	72.8
16								98.4	92.5	87.1	82.0	77.0
17									95.6	90.3	85.4	80.6
18									98.6	93.3	88.4	83.9
19										96.1	91.3	86.8
20										98.7	94.0	89.5
21											96.5	92.1
22											98.9	94.5
23												96.8
24												98.9

Traverse Points	
No.	Distance From Wall
	PORT DEPTH INCLUDED
1	26.5
2	43.5
3	60.5
4	77.5
5	94.5
6	111.5
7	128.5
8	145.5
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	