APPENDIX A
DETAILED TEST DATA AND TEST RESULTS

FGD INLET

TABLE A-1
SMEPA
SUMMARY OF MERCURY SPECIATION TEST DATA AND TEST RESULTS
UNIT NO. 2 FGD INLET

TEST DATA:				
Test run number	1	2	3	AVERAGE
Location		Unit No. 2 Inlet		
Test date	10/27/99	10/28/99	10/28/99	----
Test time period	1355-1623	902-1125	1232-1507	----
PROCESS DATA:				
Unit Load, MW	202	201	201	201
Coal feed rate, lb/hr.	158793	165648	154374	159605
Coal Btu content, Btu/lb.	12960	12760	12640	12787
Heat Input, 10^6 Btu/hr	2058	2114	1951	2041
SAMPLING DATA:				
Sampling duration, min.	125.0	125.0	125.0	125.0
Nozzle diameter, in.	0.196	0.196	0.196	0.196
Cross sectional nozzle area, sq.ft.	0.000210	0.000210	0.000210	0.000210
Barometric pressure, in. Hg	29.74	29.80	29.80	29.78
Avg. orifice press. diff., in H_2O	0.91	0.92	1.00	0.95
Avg. dry gas meter temp., deg F	89.0	89.0	101.0	93.0
Avg. abs. dry gas meter temp., deg. R	549	549	561	553
Total liquid collected by train, ml	130.0	116.8	114.0	120.3
Std. vol. of H_2O vapor coll., cu.ft.	6.1	5.5	5.4	5.7
Dry gas meter calibration factor	0.9979	0.9979	0.9979	0.9979
Sample vol. at meter cond., dcf	74.172	70.820	73.892	72.961
Sample vol. at std. cond., dscf [1]	70.888	67.823	69.264	69.325
Percent of isokinetic sampling	103.7	100.0	98.1	100.6
Sample vol. at std. cond., dscm [1]	2.007	1.921	1.961	1.963
GAS STREAM COMPOSITION DATA:				
CO_2, % by volume, dry basis	11.2	11.3	11.3	11.3
O_2, % by volume, dry basis	7.3	6.9	6.8	7.0
N_2, % by volume, dry basis	81.5	81.8	81.9	81.7
Molecular wt. of dry gas, lb/lb mole	30.08	30.08	30.08	30.08
H_20 vapor in gas stream, prop. by vol.	0.079	0.075	0.072	0.075
Mole fraction of dry gas	0.921	0.925	0.928	0.925
Molecular wt. of wet gas, lb/lb mole	29.12	29.18	29.21	29.17
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:				
Static pressure, in. H_2O	-16.50	-13.80	-14.40	-14.90
Absolute pressure, in. Hg	28.53	28.79	28.74	28.68
Avg. temperature, deg. F	330	331	333	331
Avg. absolute temperature, deg.R	790	791	793	791
Pitot tube coefficient	0.84	0.84	0.84	0.84
Total number of traverse points	25	25	25	25
Avg. gas stream velocity, ft./sec.	74.2	72.7	75.7	74.2
Stack/duct cross sectional area, sq.ft.	100.000	100.000	100.000	100.000
Avg. gas stream volumetric flow, wacf/min.	445365	436122	454344	445277
Avg. gas stream volumetric flow, dscf/min. [1]	261142	258965	269589	263232
Recalculated Inlet Flow Rate [4]				
Avg. **Stack** gas stream volumetric flow, dscf/min. [1]	512020	523151	489723	508298
Stack O_2, % by volume, dry basis	7.6	7.2	7.2	7.3
Corrected Inlet volumetric flow rate, dscf/min [4]	500808	512020	475928	496252
MERCURY LABORATORY REPORT DATA:				
Particulate bound, ug	0.0890	0.0250	0.0310	0.0483
Oxidized, ug	16.5000	12.5000	10.8000	13.2667
Elemental, ug	6.7500	6.1600	5.1400	6.0167
Total catch, ug [3]	23.3390	18.6850	15.9710	19.3317

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TABLE A-1
SMEPA
ONTARIO HYDRO METHOD DATA INPUTS
UNIT NO. 2 FGD INLET

Test Data					
Run number	1		2		3
Location			Unit No. 2 Inlet		
Date	10/27/99		10/28/99		10/28/99
Time period	1355-1623		902-1125		1232-1507
Operator	JP/TB/JM		JP/TB/JM		JP/TB/JM
Process Data					
Unit Load, MW	202		201		201
Coal feed rate, lb/hr.	158793		165648		154374
Coal Btu content, Btu/lb.(as received)	12960		12760		12640
Heat Input, 10^6 Btu/hr	2058		2114		1951
Inputs For Calcs.					
Sq. rt. delta P	1.060		1.043		1.085
Delta H	0.912		0.924		1.000
Stack temp. (deg.F)	330		331		333
Meter temp. (deg.F)	89		89		101
Sample volume (act.)	74.172		70.820		73.892
Barometric press. (in.Hg)	29.74		29.80		29.80
Volume H_2O imp. (ml)	116.7		98.6		100.8
Weight chnge sil. gel (g)	13.3		18.2		13.2
% CO_2	11.2		11.3		11.3
% O_2	7.3		6.9		6.8
% N	81.5		81.8		81.9
Area of stack (sq.ft.)	100.00		100.00		100.00
Sample time (min.)	125.00		125.00		125.00
Static pressure (in.H_2O)	-16.50		-13.80		-14.40
Nozzle dia. (in.)	0.196		0.196		0.196
Meter box cal.	0.9979		0.9979		0.9979
Cp of pitot tube	0.84		0.84		0.84
Traverse points	25		25		25
Mercury Laboratory Report Data					
Particulate bound, ug	0.0890	<	0.0250	<	0.0310
Oxidized, ug	16.5000		12.5000		10.8000
Elemental, ug	6.7500		6.1600		5.1400
Total mercury catch, ug	23.3390		18.6850		15.9710

Note: Non-detects included in total mercury catch value.

CW
1/27/00

PARTICULATE BOUND MERCURY EMISSIONS:						
Conc., ug/m^3	0.04	<	0.01	<	0.02	0.02
Conc., ug/Nm^3 (2)	0.05	<	0.01	<	0.02	0.03
Emission rate, lbs/10^{12} Btu.	0.04	<	0.01	<	0.01	0.02
Emission rate, lbs/hr	8.32E-05	<	2.50E-05	<	2.82E-05	4.54E-05
OXIDIZED MERCURY EMISSIONS:						
Conc., ug/m^3	8.22		6.51		5.51	6.75
Conc., ug/Nm^3 (2)	8.82		6.98		5.91	7.24
Emission rate, lbs/10^{12} Btu.	7.49		5.91		5.03	6.14
Emission rate, lbs/hr	1.54E-02		1.25E-02		9.82E-03	1.26E-02
ELEMENTAL MERCURY EMISSIONS:						
Conc., ug/m^3	3.36		3.21		2.62	3.06
Conc., ug/Nm^3 (2)	3.61		3.44		2.81	3.29
Emission rate, lbs/10^{12} Btu.	3.07		2.91		2.39	2.79
Emission rate, lbs/hr	6.31E-03		6.15E-03		4.67E-03	5.71E-03
TOTAL MERCURY EMISSIONS: (3)						
Conc., ug/m^3	11.63		9.73		8.14	9.83
Conc., ug/Nm^3 (2)	12.47		10.44		8.74	10.55
Emission rate, lbs/10^{12} Btu.	10.60		8.83		7.44	8.95
Emission rate, lbs/hr	2.18E-02		1.87E-02		1.45E-02	1.83E-02

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 inches Hg (760mm Hg). These values are shown only to present the VFR measured at the selected Inlet duct (1 of 2) and were not used to calculated Inlet mass pollutant emission rates (lb/hr).

(2) Nm3 = Normal cubic meter (32 deg. F. (0 deg. C.) and 29.92 inches Hg (760mm Hg)).

(3) Non-detects included in total mercury catch value.

(4) Outlet volumetric flow rate was corrected for the Inlet O2 values measured since only one of the two Inlet ducts were sampled at the Inlet location. The corrected volumetric flow rate was used to calculated Inlet mass pollutant emission rates (lb/hr)

CW
VCH

FGD OUTLET

TABLE A-1
SMEPA
SUMMARY OF MERCURY SPECIATION TEST DATA AND TEST RESULTS
UNIT NO. 2 FGD OUTLET

TEST DATA:							
Test run number		1		2	3		AVERAGE
Location				Unit No. 2 Inlet			
Test date		10/27/99		10/28/99	10/28/99		---
Test time period		1355-1623		902-1125	1232-1507		---
PROCESS DATA:							
Unit Load, MW		202		201	201		201
Coal feed rate, lb/hr.		158793		165648	154374		159605
Coal Btu content, Btu/lb.		12960		12760	12640		12787
Heat Input, 10^6 Btu/hr		2058		2114	1951		2041
SAMPLING DATA:							
Sampling duration, min.		120.0		120.0	120.0		120.0
Nozzle diameter, in.		0.210		0.210	0.210		0.210
Cross sectional nozzle area, sq.ft.		0.000241		0.000241	0.000241		0.000241
Barometric pressure, in. Hg		29.74		29.80	29.80		29.78
Avg. orifice press. diff., in H_2O		1.27		1.31	1.17		1.25
Avg. dry gas meter temp., deg F		95.0		87.0	95.0		92.3
Avg. abs. dry gas meter temp., deg. R		555		547	555		552
Total liquid collected by train, ml		215.6		199.4	207.6		207.5
Std. vol. of H_2O vapor coll., cu.ft.		10.1		9.4	9.8		9.8
Dry gas meter calibration factor		0.9961		0.9961	0.9961		0.9961
Sample vol. at meter cond., dcf		72.922		72.820	70.609		72.117
Sample vol. at std. cond., dscf [1]		68.875		69.933	66.809		68.539
Percent of isokinetic sampling		102.7		102.1	104.2		103.0
Sample vol. at std. cond., dscm [1]		1.950		1.980	1.892		1.941
GAS STREAM COMPOSITION DATA:							
CO_2, % by volume, dry basis		11.1		11.1	11.0		11.1
O_2, % by volume, dry basis		7.6		7.2	7.2		7.3
N_2, % by volume, dry basis		81.3		81.7	81.8		81.6
Molecular wt. of dry gas, lb/lb mole		30.08		30.06	30.05		30.06
H_20 vapor in gas stream, prop. by vol.		0.128		0.118	0.128		0.125
Mole fraction of dry gas		0.872		0.882	0.872		0.875
Molecular wt. of wet gas, lb/lb mole		28.53		28.64	28.51		28.56
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:							
Static pressure, in. H_2O		-0.47		-0.48	-0.48		-0.48
Absolute pressure, in. Hg		29.71		29.76	29.76		29.74
Avg. temperature, deg. F		182		190	191		188
Avg. absolute temperature, deg.R		642		650	651		648
Pitot tube coefficient		0.84		0.84	0.84		0.84
Total number of traverse points		12		12	12		12
Avg. gas stream velocity, ft./sec.		54.4		55.6	52.6		54.2
Stack/duct cross sectional area, sq.ft.		220.350		220.350	220.350		220.350
Avg. gas stream volumetric flow, wacf/min.		719759		734581	696019		716786
Avg. gas stream volumetric flow, dscf/min. [1]		512020		523151	489723		508298
MERCURY LABORATORY REPORT DATA:							
Particulate bound, ug	<	0.0800	<	0.0480	< 0.0510	<	0.0597
Oxidized, ug		2.9900		2.7200	1.6300		2.4467
Elemental, ug		7.2500		6.8400	6.6000		6.8967
Total catch, ug[3]		10.3200		9.6080	8.2810		9.4030
PARTICULATE BOUND MERCURY EMISSIONS:							
Conc., ug/m^3		0.04	<	0.02	< 0.03		0.03
Conc., ug/Nm^3 [2]		0.04	<	0.03	< 0.03		0.03
Emission rate, $lbs/10^{12}$ Btu.		0.04	<	0.02	< 0.03		0.03
Emission rate, lbs/hr		7.87E-05	<	4.75E-05	< 4.94E-05		5.85E-05

TABLE A-1
SMEPA
ONTARIO HYDRO METHOD DATA INPUTS
UNIT NO. 2 FGD OUTLET

Test Data						
Run number		1		2		3
Location				Unit No. 2 Inlet		
Date		10/27/99		10/28/99		10/28/99
Time period		1355-1623		902-1125		1232-1507
Operator		JP/TB/JM		JP/TB/JM		JP/TB/JM
Process Data						
Unit Load, MW		202		201		201
Coal feed rate, lb/hr.		158793		165648		154374
Coal Btu content, Btu/lb.(as received)		12960		12760		12640
Heat Input, 10^6 Btu/hr		2058		2114		1951
Inputs For Calcs.						
Sq. rt. delta P		0.871		0.886		0.837
Delta H		1.265		1.311		1.170
Stack temp. (deg.F)		182		190		191
Meter temp. (deg.F)		95		87		95
Sample volume (act.)		72.922		72.820		70.609
Barometric press. (in.Hg)		29.74		29.80		29.80
Volume H_2O imp. (ml)		200.4		186.0		195.2
Weight chnge sil. gel (g)		15.2		13.4		12.4
% CO_2		11.1		11.1		11.0
% O_2		7.6		7.2		7.2
% N		81.3		81.7		81.8
Area of stack (sq.ft.)		220.35		220.35		220.35
Sample time (min.)		120.00		120.00		120.00
Static pressure (in.H_2O)		-0.47		-0.48		-0.48
Nozzle dia. (in.)		0.210		0.210		0.210
Meter box cal.		0.9961		0.9961		0.9961
Cp of pitot tube		0.84		0.84		0.84
Traverse points		12		12		12
Mercury Laboratory Report Data						
Particulate bound, ug	<	0.0800	<	0.0480	<	0.0510
Oxidized, ug		2.9900		2.7200		1.6300
Elemental, ug		7.2500		6.8400		6.6000
Total mercury catch, ug		10.3200		9.6080		8.2810

Note: Non-detects included in total mercury catch value.

OXIDIZED MERCURY EMISSIONS:				
Conc., ug/m^3	1.53	1.37	0.86	1.26
Conc., ug/Nm^3 (2)	1.64	1.47	0.92	1.35
Emission rate, lbs/10^{12} Btu.	1.43	1.27	0.81	1.17
Emission rate, lbs/hr	2.94E-03	2.69E-03	1.58E-03	2.40E-03
ELEMENTAL MERCURY EMISSIONS:				
Conc., ug/m^3	3.72	3.45	3.49	3.55
Conc., ug/Nm^3 (2)	3.99	3.71	3.74	3.81
Emission rate, lbs/10^{12} Btu.	3.46	3.20	3.28	3.32
Emission rate, lbs/hr	7.13E-03	6.77E-03	6.40E-03	6.77E-03
TOTAL MERCURY EMISSIONS: (3)				
Conc., ug/m^3	5.29	4.85	4.38	4.84
Conc., ug/Nm^3 (2)	5.68	5.21	4.70	5.19
Emission rate, lbs/10^{12} Btu.	4.93	4.50	4.11	4.51
Emission rate, lbs/hr	1.01E-02	9.51E-03	8.03E-03	9.23E-03

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 inches Hg (760mm Hg).

(2) Nm3 = Normal cubic meter (32 deg. F. (0 deg. C.) and 29.92 inches Hg (760mm Hg)).

(3) Non-detects included in total mercury catch value.

APPENDIX B
PROCESS OPERATIONS, FACILITY CEMS AND FGD/BAGHOUSE DATA

MERCURY RUN 1

--- Emissions Specified Average Custom Report ---
for Relative Accuracy Test Audit (RATA)

SMEPA Morrow
Unit #2

From 13:55 10/27/99 Through 16:23 10/27/99

SO2	Low	ppm :	242.59
SO2	High	ppm :	245.02
NOx	Low	ppm :	257.88
NOx	High	ppm :	261.36
	CO2	% :	11.18
NOx	Low	lb/mmBtu :	0.496
NOx	High	lb/mmBtu :	0.503
Stack	Flow	kscfh :	~~8380~~ NA
	Load	MW :	202

Mercury Run 2

--- Emissions Specified Average Custom Report ---
for Relative Accuracy Test Audit (RATA)

SMEPA Morrow
Unit #2

From 9:02 10/28/99 Through 11:25 10/28/99

SO2	Low	ppm :	245.88
SO2	High	ppm :	243.00
NOx	Low	ppm :	252.79
NOx	High	ppm :	271.64
	CO2	% :	11.05
NOx	Low	lb/mmBtu :	0.492
NOx	High	lb/mmBtu :	0.529
Stack	Flow	kscfh :	~~4505~~ NA
	Load	MW :	201

MERCURY RUN 3

--- Emissions Specified Average Custom Report ---
for Relative Accuracy Test Audit (RATA)

SMEPA Morrow
Unit #2

From 12:32 10/28/99 Through 15:07 10/28/99

SO2	Low	ppm :	238.10
SO2	High	ppm :	242.96
NOx	Low	ppm :	252.14
NOx	High	ppm :	263.13
	CO2	% :	10.96
NOx	Low	lb/mmBtu :	0.494
NOx	High	lb/mmBtu :	0.516
Stack	Flow	kscfh :	~~4188~~ NA
	Load	MW :	201

RUN 1

DATE: **10/27/99**

Unit 2 Mercury Testing
Coal Feeder Readings (lbs)

	A1	A2	B1	B2	C1	C2
2:00 PM	1,984,049	99,199,999	37,191,300	22,128,247	27,361,057	42,256,439
3:00 PM	2,011,980	99,227,676	37,217,403	22,154,737	27,386,907	42,281,877
	27,931	27,677	26,103	26,490	25,850	25,438
	coal feedrate	159,489	lbs /hr			

	A1	A2	B1	B2	C1	C2
3:00 PM	2,011,980	99,227,676	37,217,403	22,154,737	27,386,907	42,281,877
4:00 PM	2,040,032	99,255,426	37,243,059	22,180,741	27,412,400	42,307,018
	28,052	27,750	25,656	26,004	25,493	25,141
	coal feedrate	158,096	lbs /hr			

Avg- 158,793 lb/hr

DATE: **10/28/99**

Unit 2 Mercury Testing
Coal Feeder Readings (lbs)

	A1	A2	B1	B2	C1	C2
9:00 AM	2,452,465	99,663,920	3,762,595	22,569,290	27,810,822	42,702,621
10:00 AM	2,479,604	99,690,825	37,653,076	22,596,679	27,836,140	42,727,603
	27,139	26,905	~~33,890,481~~ 27126	27,389	25,318	24,982
	coal feedrate	~~34,022,~~214 lbs /hr		158859		

	A1	A2	B1	B2	C1	C2
10:00 AM	2,479,604	99,690,825	37,653,076	22,596,679	27,836,140	42,727,603
11:00 AM	2,506,891	99,717,838	37,680,316	22,624,334	27,861,640	42,752,759
	27,287	27,013	27,240	27,655	25,500	25,156
	coal feedrate	159,851 lbs /hr				

	A1	A2	B1	B2	C1	C2
11:00 AM	2,506,891	99,717,838	37,680,316	22,624,334	27,861,640	42,752,759
12:00 PM	2,536,659	99,747,331	37,711,083	22,655,533	27,890,328	42,781,079
	29,768	29,493	30,767	31,199	28,688	28,320
	coal feedrate	178,235 lbs /hr				

Avg. 165,648 lb/hr

DATE: **10/28/99**

Unit 2 Mercury Testing
Coal Feeder Readings (lbs)

	A1	A2	B1	B2	C1	C2
12:30 PM	2,549,483	-	37,724,287	22,668,956	27,902,654	42,793,249
1:30 PM	2,575,657	-	37,750,103	22,695,137	27,927,561	42,817,798
	26,174	25,525	25,816	26,181	24,907	24,549
	coal feedrate	153,152	lbs /hr			

	A1	A2	B1	B2	C1	C2
1:30 PM	2,575,657	-	37,750,103	22,695,137	27,927,561	42,817,798
2:30 PM	2,601,830	-	37,775,919	22,721,318	27,952,467	42,842,347
	26,173	25,525	25,816	26,181	24,906	24,549
	coal feedrate	153,150	lbs /hr			

	A1	A2	B1	B2	C1	C2
2:30 PM	2,601,830	99,811,886	37,775,919	22,721,318	27,952,467	42,842,347
3:30 PM	2,628,852	99,838,631	37,802,747	22,748,461	27,977,187	42,866,710
	27,022	26,745	26,828	27,143	24,720	24,363
	coal feedrate	156,821	lbs /hr			

Avg- 154,374 lb/hr

SCRUBBER MAKE-UP 15-MIN AVG. (gpm)

Database Flags Report for File: SCR_F_15M.2 (Start: 10/27/99 13:45)

Time	Meas. Value	Subst. Value	EXCEED RC	EXCEED CA	-CEMS- RC	-CEMS- CA	FLAGS 1234567890	FLAGS 1234567890	FLAGS 123456789
Date: 10/27									
13:45	20.421	0.000	0	0	0	0	-------8--	----------	---------
14:00	55.413	0.000	0	0	0	0	-------8--	----------	---------
14:15	38.895	0.000	0	0	0	0	-------8--	----------	---------
14:30	11.821	0.000	0	0	0	0	-------8--	----------	---------
14:45	54.245	0.000	0	0	0	0	-------8--	----------	---------
15:00	36.697	0.000	0	0	0	0	-------8--	----------	---------
15:15	17.118	0.000	0	0	0	0	-------8--	----------	---------
15:30	44.645	0.000	0	0	0	0	-------8--	----------	---------
15:45	39.964	0.000	0	0	0	0	-------8--	----------	---------
16:00	14.965	0.000	0	0	0	0	-------8--	----------	---------
16:15	50.367	0.000	0	0	0	0	-------8--	----------	---------

Database Flags Report for File: SCR_F_15M.2 (Start: 10/28/99 09:00)

Time	Meas. Value	Subst. Value	EXCEED RC	EXCEED CA	-CEMS- RC	-CEMS- CA	FLAGS 1234567890	FLAGS 1234567890	FLAGS 123456789
Date: 10/28									
09:00	4.221	0.000	0	0	0	0	-------8--	----------	---------
09:15	49.408	0.000	0	0	0	0	-------8--	----------	---------
09:30	56.766	0.000	0	0	0	0	-------8--	----------	---------
09:45	-0.173	0.000	0	0	0	0	-------8--	----------	---------
10:00	44.772	0.000	0	0	0	0	-------8--	----------	---------
10:15	37.066	0.000	0	0	0	0	-------8--	----------	---------
10:30	12.118	0.000	0	0	0	0	-------8--	----------	---------
10:45	48.557	0.000	0	0	0	0	-------8--	----------	---------
11:00	32.279	0.000	0	0	0	0	-------8--	----------	---------
11:15	12.430	0.000	0	0	0	0	-------8--	----------	---------

Database Flags Report for File: SCR_F_15M.2 (Start: 10/28/99 12:30)

Time	Meas. Value	Subst. Value	EXCEED RC	EXCEED CA	-CEMS- RC	-CEMS- CA	FLAGS 1234567890	FLAGS 1234567890	FLAGS 123456789
Date: 10/28									
12:30	29.527	0.000	0	0	0	0	-------8--	----------	---------
12:45	18.012	0.000	0	0	0	0	-------8--	----------	---------
13:00	49.275	0.000	0	0	0	0	-------8--	----------	---------
13:15	14.174	0.000	0	0	0	0	-------8--	----------	---------
13:30	32.540	0.000	0	0	0	0	-------8--	----------	---------
13:45	46.025	0.000	0	0	0	0	-------8--	----------	---------
14:00	1.810	0.000	0	0	0	0	-------8--	----------	---------
14:15	46.062	0.000	0	0	0	0	-------8--	----------	---------
14:30	38.790	0.000	0	0	0	0	-------8--	----------	---------
14:45	7.775	0.000	0	0	0	0	-------8--	----------	---------
15:00	41.036	0.000	0	0	0	0	-------8--	----------	---------
15:15	41.741	0.000	0	0	0	0	-------8--	----------	---------

R.D. Morrow, Sr. Generating Plant

Scrubber Daily Log | | | **Unit No.** Two **Date** 10-21-99

Time	Avg. Boiler Load	Scrubber Total Load	Mill Amps	Mill Sump Density	I/B LV	R/C Pump Amps A	R/C Pump Amps B	R/C Pump Amps C	R/C Pump Press A	R/C Pump Press B	R/C Pump Press C	R/C Bleed Flow	Opacity	SO_2 PPM	SO_2 Outlet MM/BTU	NO_x Outlet MM/BTU	CO_2 Outlet %	NO_x PPM	O_2	MOD ΔP	DBM ΔP	Mist Outlet Temp	Stack Temp	R/C Inlet Level	R/C Inlet pH	Recycle Density	Flyash Outlet Level	Suppression Tk Level	Makeup Rate Totals	Excursions SO_2	Excursions NO_x	Excursions OPAC	Slurry Pump On	Dilution Pump On
12A	204	16.6			230	40	40					97	3.5	251	0.65	0.43	11.4	354	8.7	8.6	1.0	135	179	16.2	5.32		4.6	6.0	48				✓	✓
1	204	16.3			250	40	40					97	3.6	253	0.65	0.43	11.4	354	9.0	8.7	1.0	135	179	16.1	5.33		4.5	5.4	48				✓	✓
2	203	14.6			230	40	40					95	9.6	249	0.64	0.43	11.5	353	9.1	8.6	1.0	135	178	16.6	5.34		4.4	5.0	48				✓	✓
3	203	13.5			220	40	40					96	9.5	247	0.62	0.42	11.6	347	9.2	7.9	.94	135	178	16.8	5.34									
4	174				175	40	40					94	7.9	222	0.56	0.35	11.6	334	9.2	6.8	.72	135	181	16.4	5.36									
5	170				185	40	40					93	6.5	227	0.61	0.35	11.4	339	8.9	7.0	.76	134	180	16.6	5.35									
6	173				170	40	40					98	9.2	236	0.63	0.39	11.2	349	9.8	7.6	.86	134	175	16.7	5.29									
7	193				205	40	40					96	8.5	267	0.60	0.42	11.2	2539	9.2	7.5	.8	124	182	16.7	5.2									
8	192				215	42	41					96	7	241	0.58	0.37	11.3	243	8.6	7.4	.8	125	183	16.7	5.3									
9	190				195	42	41					97	10.1	260	0.64	0.41	11.3	3252	8.8	8	.9	125	181	16.7	5.4									
10	204				210	42	41					96	8.6	249	0.61	0.39	11.3	3257	8.7	8.9	1.0	126	181	16.5	5.3				1					
11	204				230	42	41					96	8.4	263	0.65	0.40	11.3	3259	8.7	9	1	125	183	16.3	5.3									
12P	202				235	42	41					96	8.5	260	0.63	0.39	11.2	2508	8.6	8.6	.9	127	184	16.1	5.2									
1	199				245	41	41					95	9.1	251	0.62	0.36	11.1	256	8.6	8.7	.9	126	184	16.1	5.2									
2	200				250	41	41					96	9.5	239	0.59	0.34	11.3	253	8.59	9.3	1	127	180	16.1	5.3									
3	202				260	41	41					96	9	242	0.63	0.39	11.2	265	8.4	9.1	1	127	—	16.1	5.4									
4	202				260	41	41					96	7.7	234	0.56	0.30	11.2	265	8.5	9.2	1	128	—	16.2	5.4									
5	201				300	41	41					96	8	238	0.56	0.30	11.1	258	8.5	8.9	1	128	179	16.1	5.4									
6	198				285	41	41					96	6.5	247	0.62	0.40	11.2	243	8.3	7.9	.8	127	180	16.3	5.3									
7	186				290	41	40					94	6.4	250	0.65	0.42	11.3	248	8.3	8.6	.89	126	178	16.2	5:37									
8	194				260	41	40					95	6.5	254	0.65	0.39	11.1	257	8.3	8.6	1.0	126	177	16.6	5:38									
9	194				230	41	40					97	7.0	238	0.65	0.39	11.3	255	8.4	8.5	1.0	126	176	16.8	5:44									
10	193				250	41	40					94	7.0	235	0.63	0.39	11.3	247	8.3	8.1	1.0	126	176	16.8	5:31									
11	190				215	41	40					94	6.3	232	0.64	0.39	11.4	235	8.8	7.6	1.0	125	176	16.9	5:42									
Totals																																		

Comments:

Shift Operator

7	Coulter
7N	Hillman Broom
7D	Kenny
7	D Stevens
7N	Coulter
	Hillman Broom

R.D. Morrow, Sr. Generating Plant
Scrubber Daily Log

Unit No. Two Date 10/22/99

Hr	Avg Boiler Load	Seconder Tank Level	Mill Amps	Mill Sump Density	T/R kV	R/C Pump Amps A	R/C Pump Amps B	R/C Pump Amps C	R/C Pump Press A	R/C Pump Press B	R/C Pump Press C	R/C Bleed Flow	Opacity	SO_2 PPM	SO_2 Ounce Mol/BTU	NO_x Ounce Mol/BTU	CO_2 Content %	NO_x PPM	O_2	MOD ΔP	DBH ΔP	Mist Outlet Temp.	Stack Temp	R/C Tank Level	R/C Tank pH	Recycle Slurry Density	Flow Chalk Level	Temperature °F Level	Broken Hole Timers	Excursions SO_2	Excursions NO_x	Excursions OPAC	Sec Trough Pump On	Divider Pump On
12A	176				210		42	41				78	6.6	218	3.4/60	58/63	10.4/11.1	242	4.6	7.2	1	124	176	16.8	5.42									
1	167				225		42	41				97	6.3	210	3.5/60	58/63	10.4/10.7	239	4.5	6.3	1	125	178	16.6	5.4									
2	160				170		42	41				98	6.2	222	3.5/60	58/63	10.5/10.1	238	4.7	6.2	1	125	184	16.3	5.37									
3	159				180		42	41				97	6	240	3.6/60	58/63	10.5/10.7	238	4.9	6.1	1.1	124	183	16.1	5.43									
4	159				185		42	41				97	6	235	3.6/60	58/63	10.5/10.4	230	5.0	6.0	1.1	124	182	16.1	5.31									
5	161				155		42	41				95	7.3	244	3.5/60	58/63	10.5/10.4	247	5.5	7.2	1.4	125	179	16.2	5.46									
6	184				205		44	41				95	9.3	232	3.5/60	58/63	10.5/10.9	240	5.7	8.2	1.4	125	180	16.2	5:35									
7	203				225		42	41				94	8	265	3.6/60	58/63	10.5/11.2	267	5.8	8.6	1.7	125	178	16.4	5.4				1					
8	203				225		42	41				95	8.2	271	3.6/60	58/63	10.5/11.1	269	5.9	8.4	1.6	125	182	16.7	5.4				1	1				
9	201				215		41	41				97	8.6	252	3.5/60	58/63	10.5/11.1	258	5.9	8.3	1.9	126	—	16.8	5.4				1					
10	201				210		41	41				96	8.1	252	3.5/60	58/63	10.5/11.1	258	5.9	8.5	2.1	127	—	16.7	5.3									
11	201				315		41	41				98	8.2	250	3.5/60	58/63	10.5/11.1	258	5.7	8.3	2.5	127	—	16.5	5.4									
DP	200				235		41	41				96	7.6	238	3.5/60	58/63	10.5/11.1	243	5.7	8.4	2.1	127	—	16.2	5.4									
1	200				300		41	41				95	7.8	240	3.5/60	58/63	10.5/11.1	250	5.7	8.3	1.9	127	—	16.0	5.4									
2	200				270		41	41				94	7.1	248	3.5/60	58/63	10.5/11.1	255	5.7	8.4	2.2	127	—	16.2	5.3									
3	200				280		41	41				94	7.7	232	3.5/60	58/63	10.5/11.1	252	5.7	8.5	2.2	127	—	16.4	5.3									
4	188				250		41	41				97	6.7	196	3.5/60	58/63	10.5/11.1	266	5.4	6.8	2.1	127	192	16.6	5.4									
5	112				95		41	41				96	7.1	179	3.5/60	58/63	10.5/11.1	195	5.5	3.8	1.9	125	191	16.9	5.3									
6	99				115		41	41				96	7.5	200	3.5/60	58/63	10.5/11.1	180	5.6	3.8	2.1	125	186	16.75	5.3									
7	99				135		41	41				96	6.2	179	3.5/60	58/63	10.5/11.1	185	5.5	3.8	2.0	124	184	16.55	5.28									
8	100				130		41	41				92	5.6	229	3.5/60	58/63	10.5/11.1	182	5.2	3.9	2.0	124	184	16.35	5.27									
9	100				140		41	41				96	5.8	231	3.5/60	58/63	10.5/11.1	183	5.2	3.8	2.1	124	182	16.45	5.24									
10	106				145		41	41				96	9.2	236	3.5/60	58/63	10.5/11.1	188	5.0	3.8	2.1	123	183	15.8	5.42									
11																																		
Totals																																		

RUN 2

RUN 3

Comments:

Shift Operator

7/w	Cox/Hsc
	Hillman Broom
TP	K. Legan
	D. Elmore

UNIT —

DATE

CONTROL ROOM LOG SHEET — R.D. MORROW STEAM PLANT

TIME	GENERATION: GMW	GEN. MVAR	GEN. MW	GEN. AMPS	GENERATOR: COLD GAS TEMP	GEN. FIELD VOLTS	GEN. FIELD AMPS	MEGA-VARS	PHASE HIGH VOLTS	PHASE HIGH AMPS	EHC PUMP II GPM	TURBINE: STEAM TEMP.	RE-HEAT TEMP.	STEAM PRESS.	M.B.F.P.T. BRG. TEMP: PUMP #1	PUMP #2	AUX. COND. ABS PRESS.	STEAM PRESSURES:	FIRST STAGE	HOT R.H.	DRUM	AIR & GAS PRESSURES: A F.D. DISC. PRESS.	B F.D. DISC. PRESS.	A AIR HTR DIFF.	B AIR HTR DIFF.	WIND BOX	SEC. SH. OUT	PRI. SH. OUT	REHEAT	ECON. OUT	PRE-CIP. OUT	H2O PRESS: FWBP SUCT. PSI	MBFP SUCT. PSI
12 MN.		988	2743	6171																													
1 AM.	200	987	2159	6178	184	28-8	185	880	10	193	1820	6.5	971	976	1.8	110	109	1.2	2390	1841	580	2197	6.0	6.0	26	30	1.4	26	34	40	62	8.0	96	110
2 AM.	205	60	2174	6181	186	—	—	8959	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3 AM.	201	267	2188		189	—	—	8654	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4 AM.	170	439	2303		167	29-7	170	770	-7	181	1200	6.5	988	944	1.8	109	109	1.2	2390	1470	442	2197	3.5	3.5	2.6	2.2	2.2	26	32	38	5.4	6.2	84	140
5 AM.	170	607	2316		186	29-9	170	770	0	191	1200	6.4	991	993	1.8	109	109	1.2	2398	1482	469	2197	3.5	3.5	2.6	2.2	2.2	2.6	32	38	5.4	6.4	84	140
6 AM.	185	782	2338		160	29-8	170	770	10	192	1240	6.4	1000	988	1.8	104	104	1.2	2396	1602	520	2206	4.0	4.0	2.2	2.4	1.0	2.6	3.2	4.0	5.8	6.2	88	150
7 AM.	196	985	2345		187	30-0	195	870	18	19.2	1570	6.4	993	996	2.0	110	105	1.2	2401	1732	534	2576	5.5	5.5	2.4	3.2	1.6	2.7	3.5	4.2	6.0	7.4	94	148
8 AM.	201	1171	2358		193	30-9	198	850	10	19.2	1550	6.5	990	996	2.0	110	107	1.5	2397	1682	521	2566	5.0	5.0	2.6	3.0	1.0	2.7	3.5	4.4	6.2	7.3	94	146
9 AM.	196	1324	2373		198	32-2	180	960	5	19.2	1640	6.5	997	997	2.0	111	96	1.4	2401	1723	533	2576	1.0	1.0	2.1	3.2	1.8	3.6	3.5	4.7	6.4	8.3	94	148
10 AM.	205	1572	2389		193			8939																									
11 AM.	204	1773	2383		184	33-6	195	920	20	19.5	1900	6.5	993	964	2.5	115	109	1.8	2405	1827	570	2989	6.5	6.5	2.8	3.4	2.0	3.2	3.8	4.4	6.2	8.0	98	150
12 N.	199	1980	2319		192	33-9	190	900	20	19.5	1780	6.5	982	962	2.5	116	109	1.9	2397	1796	557	2585	6.5	6.5	2.8	3.2	1.8	2.8	3.8	4.4	6.3	8.2	98	150
1 PM.	200	2179	2332		181	33-9	198	920	30	19.6	1790	6.5	991	962	2.5	116	110	1.9	2400	1782	553	2582	6.0	6.0	2.7	2.8	1.6	2.9	3.5	4.0	6.0	8.0	96	148
2 PM.	203	2380	2347		192	34-5	200	930	32	19.6	1820	6.5	980	961	2.6	117	115	2.0	2398	1818	562	2595	6.5	6.5	2.8	3.2	1.6	2.7	3.5	4.2	6.0	8.2	97	148
3 PM.	201	2579	2362		182	34-5	200	930	32	19.1	1780	6.5	979	960	2.6	118	115	2.0	2397	1815	565	2593	6.5	6.5	2.8	3.0	1.8	2.9	3.6	4.2	6.2	8.5	97	148
4 PM.	202	2782	2379		188	34-6	200	930	31	19.6	1820	6.5	987	961	2.6	118	115	1.9	2400	1804	561	2582	6.5	6.5	2.8	3.2	2.0	2.9	3.6	4.2	6.0	8.3	97	148
5 PM.	202	2986	2392		189	34-4	198	910	20	19.5	1840	6.5	984	963	2.5	118	113	1.9	2404	1784	561	2577	6.0	6.0	2.6	2.8	1.6	2.9	3.5	4.4	6.0	7.6	93	148
6 PM.	180	3168	2406		168	33-9	175	830	13	19.5	1720	6.4	965	964	2.4	117	109	1.8	2401	1569	497	2552	4.5	4.5	2.6	2.8	1.6	2.7	3.4	3.8	5.6	7.4	1.7	145
7 PM.	190	3359	2420		172	34-6	187	880	27	19.9	1820	6.6	996	969	2.6	116	109	1.8	2401	1669	534	2567	5.0	5.0	2.4	2.8	1.6	2.7	3.4	4.2	6.0	7.8	2.0	150
8 PM.	197	3560	2434		180	34-6	189	890	27	19.7	1860	6.6	997	970	2.7	118	109	1.7	2401	1774	539	2578	5.0	5.0	2.5	2.9	1.7	2.6	3.2	4.0	5.8	7.9	2.2	150
9 PM.	197	3749	2449		179	34-7	188	880	19	19.5	1800	6.5	997	970	2.5	117	108	1.7	2401	1774	537	2576	5.0	5.0	2.4	2.6	1.4	2.6	3.4	4.0	5.6	7.6	2.2	148
10 PM.	188	3938	2463		180	34-9	190	880	3	19.6	1800	6.5	1000	970	2.6	114	107	1.6	2398	1687	516	2581	5.0	5.0	2.4	2.6	1.2	2.6	3.4	4.0	5.4	7.4	2.2	150
11 PM.	193	4129	2477		177	34-8	190	850	8	19.5	1800	6.5	998	962	2.6	113	107	1.6	2401	1689	521	2570	5.0	5.0	2.4	2.8	1.4	2.6	3.4	4.0	5.4	7.4	2.4	150
12 MN.	196	4309	2491		165	32-1	170	770	5	19.2	1700	6.5	1002	962	2.8	112	107	1.6	2398	1619	497	2498	4.0	4.0	2.0	2.6	1.6	2.6	3.2	4.0	5.6	7.0	6.8	138
TOTAL		4165	2481	19	4291								990		2.02				2400														

MILL CLASSIFIERS — FLOW — O2 — DA.

TIME	MILL CLASSIFIERS: A-1 DIFF. TEMP.	A-2 DIFF. TEMP.	B-1 DIFF. TEMP.	B-2 DIFF. TEMP.	C-1 DIFF. TEMP.	C-2 DIFF. TEMP.	FLOW: AIR	STEAM	F.W.	O2: EAST	WEST	DA. TEMP.
12 MN.	-	-	-	-	-	-						
1 AM.	14-149	14-150	13-150	14-149	11-150	11-150	86.0	1478	1491	3.6	3.8	300
2 AM.												
3 AM.												
4 AM.	11-149	11-150	11-149	12-149	9-145	9-148	69.7	1156	1189	4.0	4.0	298
5 AM.	11-148	10-150	10-150	12-149	9-150	9-150	76.0	1452	1480	4.0	3.8	297
6 AM.	11-146	11-148	11-146	11-144	10-150	10-150	76.0	1426	1469	4.0	4.0	296
7 AM.	12-148	12-150	12-150	13-148	10-149	10-148	80.5	1355	1345	3.2	3.8	297
8 AM.	12-149	12-149	12-150	13-148	10-150	10-149	78.4	1312	1316	3.4	3.8	294
9 AM.	13-148	12-150	12-150	13-148	9-150	10-150	81.7	1348	1371	3.6	3.8	294
10 AM.												
11 AM.	13-149	13-150	13-150	14-150	11-150	11-150	80.3	1440	1447	4.0	4.0	302
12 N.	13-148	13-149	13-149	14-148	11-150	11-150	86.6	1463	1432	3.8	3.8	300
1 PM.	13-149	13-150	12-150	14-149	11-150	11-149	86.0	1391	1400	3.6	4.0	300
2 PM.	14-149	13-149	13-150	14-150	11-150	11-149	87.6	1458	1458	3.6	3.9	301
3 PM.	13-149	13-150	13-150	14-150	11-150	12-149	88.8	1422	1458	3.6	3.9	301
4 PM.	13-149	13-150	12-149	14-150	11-149	11-150	88.5	1414	1421	3.8	4.1	301
5 PM.	13-150	13-150	12-150	14-149	11-149	11-150	87.9	1411	1421	4.0	4.2	301
6 PM.	11-150	11-150	11-149	12-149	9-150	9-150	76.6	1288	1293	3.8	4.0	298
7 PM.	11-149	11-150	12-150	13-149	9-150	10-149	82.0	1406	1416	3.8	4.0	299
8 PM.	12-149	11-150	12-150	13-149	10-150	10-150	82.7	1411	1407	3.6	3.8	297
9 PM.	12-149	12-150	12-150	14-150	10-150	10-150	82.6	1414	1414	3.6	4.0	297
10 PM.	12-149	12-150	12-150	13-150	10-150	10-150	79.7	1391	1414	3.6	4.0	297
11 PM.	12-149	12-150	12-150	13-149	10-150	10-150	81.0	1407	1414	3.6	4.0	296
12 MN.	11-149	11-150	11-150	13-150	10-149	10-150	79.3	1389	1401	3.6	4.0	296

GENERATION READINGS — WELL PUMP E.T. METERS — TURB. VALVE TEST

	GMW	MVAR	MWHR	GMWHR	#1	#2	#3	#4	#5
END	4306	2491	6181	81771					
BEGIN	3965	2143	6191	81762					
DIFF.	461	348	10	29					

TURB. VALVE TEST: MAIN A S.V. B — INTERCEPT REHEAT R S.V. L

TURBINE VIBRATION READINGS — M.B.F.P.T. — DAILY FLOW INTEGRATORS

SHIFT	GMW	#1 BRG	#2 BRG	#3 BRG.	#4 BRG	#5 BRG	#6 BRG	M.B.F.P.T. #1 BRG	#2 BRG	#1 BRG	#2 BRG
DAY	196	.7	3.2	3.0	1.7	.8	.8	1.7	.7	2.2	1.7
NIGHT	205	.4	3.6	3.5	1.8	.5	.7	1.8	.8	2.2	1.6

DAILY FLOW INTEGRATORS: STEAM 1324082 — FEEDWATER 3289.77 — CONDENSATE 26925 — TOTAL COAL — — SUPERHEAT SPRAY 4300 — FUEL OIL —

REMARKS:

SHIFT	OPERATOR	SUPERVISOR
DAY		
NIGHT		

ACAD FILE: MWG CALCULATING

R.D. MORROW SR. GENERATING PLANT

UNIT Two

DATE 10-27-99

TIME	TURBINE: GMW	TURBINE: ACTIVE THRUST PRESS.	TURBINE: INACT. THRUST PRESS.	DISSOLVED OXYGEN: COND. DISCH	DISSOLVED OXYGEN: DA	PRECIPITATION: HEATER DRIPS	PRECIPITATION: GROUNDED TR'S	BUNKERS: SMOKE A	BUNKERS: SMOKE B	BUNKERS: SMOKE C	BURNERS: IN SERVICE	AIR HEATERS: THRUST BRG TEMP	AIR HEATERS: GUIDE BRG TEMP	AIR HEATERS: THRUST BRG TEMP	AIR HEATERS: GUIDE BRG. TEMP	CALORIMETER: TEMP	CALORIMETER: PRESS	A/B HEATER: SHELL PRESS	A/B HEATER: SHELL TEMP	A/B HEATER: DRIP TEMP	A/B HEATER:	B/C HEATER: SHELL PRESS	B/C HEATER: SHELL TEMP	B/C HEATER: DRIP TEMP	B/C HEATER: F.W. OUT TEMP	MAIN TURBINE: LA THRUST	MAIN TURBINE: ACT THRUST	MAIN TURBINE: #1 BRG	MAIN TURBINE: #2 BRG	MAIN TURBINE: #3 BRG	MAIN TURBINE: #4 BRG	MAIN TURBINE: #5 BRG	MAIN TURBINE: #6 BRG	MAIN TURBINE: BRG OIL PRESS	MAIN TURBINE: STEAM SEAL PRESS	MAIN TURBINE: EXH HOOD TEMP
2: 00AM											Busy U-1																								
4: 00AM																																			
6: 00AM	164	11	8	64	67	94	199.4					56	106	80	126	66		510	480	410	485	335	485	315	415	132	136	138	156	140	124	140	133	26	2	106
8: 00AM	195	—	-	64	74	129	190.8					54	106	77	126	72		525	480	415	485	240	410	305	425	132	138	138	158	140	134	140	135	26	1.8	106
10: 00AM	200			66	74	121	188.8				Busy U-2															141	144	142	162	144	128	145	138	26	1.7	112
12: 00AM	200	-	-	66	74	121	188.8					82	129	90	92	77	560	489	430	490	270	410	335	427	141	144	142	162	144	128	145	138	26	1.5	113
2: 00PM	200	-	-	63	70	120	192.3					82	130	90	92	78	570	490	400	495	270	415	335	435	141	144	143	164	146	128	145	139	26	1.4	114
4: 00PM	209	-	-	64	73	123	185.7					86	134	94	94	77	570	490	400	490	270	415	335	428	143	144	144	164	146	130	140	139	26	1.4	114
6: 00PM	180	—	-	56	68	109	185.5					84	136	92	94	68	560	475	410	480	230	405	335	430	142	144	144	164	146	130	146	148	26	1.3	112
8: 00PM	194			61	69	109	188.6					80	130	92	84	74	540	485	415	490	250	410	327	425	141	144	143	162	146	130	145	137	26	2.0	112
10: 00PM	180			59	66	112	176.3					74	124	90	80	73	530	485	415	470	250	405	327	425	140	142	142	161	145	128	144	138	26	1.5	110
12: 00PM	174			60	66	95	172.6					64	116	88	74	62	460	470	405	475	205	410	320	415	137	140	141	160	144	127	143	136	26	1.5	106

(485)

TIME	A/B HEATER: SHELL PRESS	A/B HEATER: SHELL TEMP	A/B HEATER: DRIP TEMP	A/B HEATER: COND OUT TEMP	A/B HEATER: SHELL PRESS	A/B HEATER: SHELL TEMP	A/B HEATER: DRIP TEMP	A/B HEATER: COND OUT TEMP	COAL FEEDER READINGS: A-1	A-2	B-1	B-2	C-1	C-2	TARGETS: 480V	A MILL AMPS: A	A MILL AMPS: B	A MILL AMPS: C	B MILL AMPS: A	B MILL AMPS: B	B MILL AMPS: C	C MILL AMPS: A	C MILL AMPS: B	C MILL AMPS: C	P.A. FAN HI AMP H COOLERS: A TEMP	P.A. FAN HI AMP H COOLERS: B OUT TEMP	P.A. FAN HI AMP H COOLERS: C OUT TEMP	P.A. FAN HI AMP H COOLERS: D OUT TEMP	AIR LEAKAGE: A MAIN	AIR LEAKAGE: B MAIN
2: 00AM																														
4: 00AM																														
6: 00AM	23	315	196	250	-13	180	133	180	01760417	98878808	36834726	21766833	26776773	41895760		89	90	89	92	93	92	92	94	92	41	47	40	80	78	78	78		
8: 00AM	26	310	200	257	-12	185	138	184	01808600	99023886	37023852	21964091	27194532	42057491		89	90	89	92	93	92	92	94	92	48	48	43	83	82	81	81		
10: 00AM	30	305	208	265	-10	194	148	192	01892	99	37	21	27	42					90	94	93				49	49	44						
12: 00AM	30	305	208	265	-10	194	148	192	01928721	99146	37190721	22076757	27470748	42526062		88	89	88	92	93	92	92	94	92	49	49	44	93	90	90	91		
2: 00PM	30	305	208	265	-10	194	148	192	01972441	99181	37211	22116	27549	42594		88	89	87	91	90	90	91	93	91	48	48	43	94	91	90	93		
4: 00PM	30	310	210	268	-10	195	150	194	02031233	99246	37	22	27	42		88	89	87	91	90	90	91	93	91	48	47	43	94	91	91	93		
6: 00PM	26	315	206	263	-11	190	147	190	02087411	99289550	37	22	27	42		88	89	87	91	92	90	92	93	92	47	47	40	94	91	91	93		
8: 00PM	29	315	206	262	-10	190	146	190	02132388	99347287	37328571	22067525	27599970	42626535		88	89	88	91	92	91	92	93	91	47	47	41	92	90	90	91		
10: 00PM	27	315	204	260	-11	187	144	187	02171715	99405450	37384112	22123754	27653754	42684623		89	90	88	92	93	91	92	93	92	50	49	43	89	87	87	88		
12: 00PM	24	320	198	255	-13	183	138	182	02240670	99453753	37429119	22169597	27707481	42744011		89	90	89	92	93	91	92	94	92	45	46	39	86	84	84	85		
TOTALS																														

REMARKS:

COAL FEEDER READINGS	
PRESENT COAL:	531,588,646
PREVIOUS COAL:	527,932,117
ADJUSTMENTS:	3,656,529 (-100)
TOTAL COAL BURNED:	36,365

SHIFT	AUXILIARY	JR. OPERATOR
11 – 7	MOZINGO	MAULDIN
7 – 3	primus	Wade
3 – 11		

R.D. MORROW SR. GENERATING PLANT

UNIT Two U-1 22850 -1500 / 23424 -1500 / 95181 -1600 / 11079 -1500 B U-2 23394 -1500 / 23427 -1600

DATE 10-27-99

TIME	CORE MON. SCAVAGE RATE	MAIN COND. VAC	#1 HEATER SHELL PRESS	#1 HEATER SHELL TEMP	#1 HEATER COND OUT TEMP	C/D OIL PRESS A-1	C/D OIL PRESS A-2	C/D OIL PRESS B-1	C/D OIL PRESS B-2	C/D OIL PRESS C-1	C/D OIL PRESS C-2	AIR LEAKAGE A AUX	AIR LEAKAGE B AUX	M.B.F.P.T. OIL COOLER IN TEMP	M.B.F.P.T. OIL COOLER OUT TEMP	M.B.F.P.T. THRUST BRG TEMP	M.B.F.P.T. H/P BRG TEMP	M.B.F.P.T. FILTER IN PRESS	M.B.F.P.T. FILTER OUT PRESS	CONT. OIL PRESS	HYD. OIL PRESS	SUCT PRESS	DISCH PRESS	MAIN OIL COOLER A OUT TEMP	MAIN OIL COOLER A OUT PRESS	MAIN OIL COOLER B OUT TEMP	MAIN OIL COOLER B OUT PRESS	MAIN OIL COOLER C OUT TEMP	MAIN OIL COOLER C OUT PRESS	OIL IN TEMP	OIL OUT TEMP	AUX. COND. COND PUMP PRESS	AUX. COND. COND VAC	AUX. COND. EXH HOOD TEMP	AUX. COND. CIRC WATER IN TEMP	AUX. COND. CIRC WATER OUT TEMP	AUX. COND. CIRC WATER OUT PRESS	VAC GLAND STEAM COND.	FULL M2 8-1-13
2:00AM																																								
4:00AM																																								
6:00AM	90	-27	-27	122	120	9	4	5	9			3900	1200	122	109	115	122	57	55	64	220	140	2550	80	27	77	28	80	30	131	109	25	-30	90	73	85	29	18	-16	
8:00AM	90	-27	-26	125	121	8	3	5	8			3950	1200	122	110	116	122	57	55	64	220	140	2600	81	27	77	28	81	30	132	110	25	-30	94	74	87	24	18	-15	5
10:00AM										BUS4																														
12:00AM	90	-27	-26	133	130	7	3	4	7			4000	1200	126	114	120	126	57	55	64	220	140	2600	87	27	85	28	87	30	137	115	25	-29	104	83	96	25	18	-15	
2:00PM	90	-27	-25	136	132	7	3	4	7			4000	1200	127	115	121	127	57	55	64	220	140	2610	89	27	86	28	89	30	138	116	25	-29	105	84	97	25	18	-15	
4:00PM	90	-27	-25	136	133	7	2	4	6			4000	1200	128	116	122	128	57	55	64	220	140	2625	89	27	86	28	89	30	139	116	25	-29	105	84	97	24	18	-15	
6:00PM	90	-27	-25	135	133	7	2	4	6			4000	1250	128	116	122	128	57	55	64	220	140	2625	89	27	86	28	89	30	139	116	25	-29	104	84	96	24	18	-15	
8:00PM	90	-27	-26	134	130	7	3	4	7			4000	1200	126	112	120	126	57	55	64	220	150	2600	89	27	87	28	27	30	138	115	25	-29	102	83	95	24	18	-15	
10:00PM	90	-27	-26	130	128	7	3	4	7			3900	1200	125	112	119	125	57	55	64	220	150	2600	87	27	84	28	86	30	137	114	25	-29	99	80	92	24	18	-15	
12:00PM	90	-27	-26	126	124	8	3	5	8			3900	1150	122	110	117	122	57	55	64	220	140	2550	85	27	82	28	85	30	136	112	25	-30	95	78	88	20	18	-15	

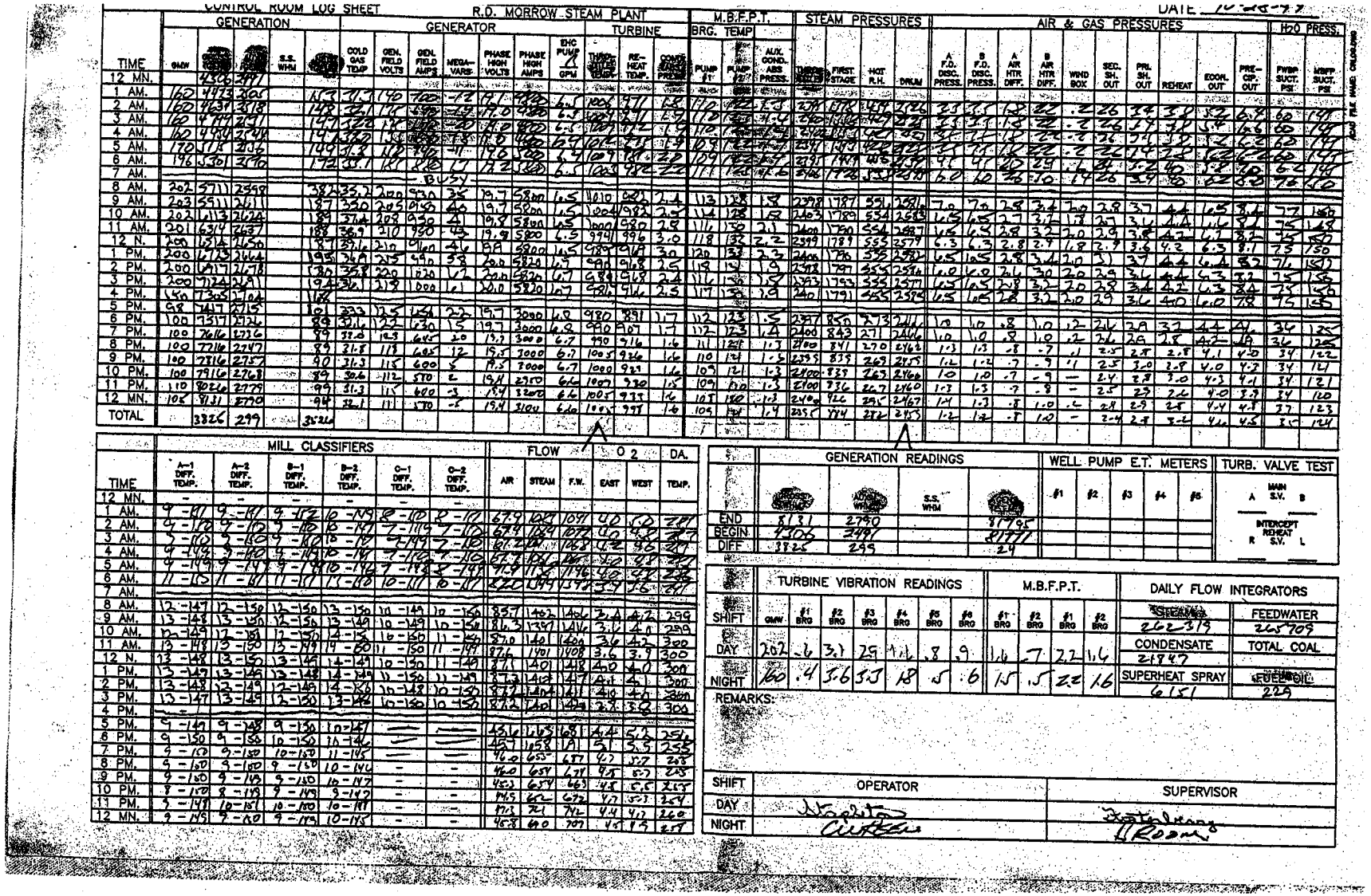
A

TIME	BOWSERS MAIN FILTER ΔP	BOWSERS BFPT. FILTER ΔP	MAIN CONDENSER CIRC WATER INLET TEMP	MAIN CONDENSER CIRC WATER OUTLET TEMP	MAIN CONDENSER CIRC WATER IN PRESS	MAIN CONDENSER CIRC WATER OUT PRESS	MAIN CONDENSER COND PUMP DISCH PRESS	MAIN CONDENSER HTR DRAIN PUMP PRESS	SERV WATER PRESS	AIR REG. PRESS	AUX CIRC. WATER PRESS	H_2 GENERATOR MECH GAS PRESS	H_2 GENERATOR PURITY	H_2 GENERATOR FAN DIFF	H_2 GENERATOR SEAL OIL PRESS	H_2 GENERATOR SEAL OIL PUMP PRESS	EHC SYS. DISCH PRESS	EHC SYS. DISCH TEMP	EHC SYS. FILTER Δ DIFF	EHC SYS. FILTER DIFF	PWBP DISCH PRESS	PWBP SUCT PRESS	PWBP SEAL WATER TEMP	PWBP OIL TEMP IN B	PWBP OIL TEMP OUT B	SUBFP DISH PRESS	SUBFP SUCT PRESS	SUBFP OIL TEMP IN B	SUBFP OIL TEMP OUT B	SUBFP OIL PUMP PRESS	AIR COMPRESSOR A	AIR COMPRESSOR B	AIR COMPRESSOR C	AIR COMPRESSOR D	AIR DRYERS DEW POINT	AIR DRYERS TANK PRESS A	AIR DRYERS TANK PRESS B	AIR DRYERS CFM OUT PURGE FLOW	AIR DRYERS CFM OUT OUTLET FLOW	COALESCER DIFF PRESS A = Inlet	COALESCER DIFF PRESS B = Out
2:00AM																																								
4:00AM																																								
6:00AM	4100	1150	75	94	21	14	240	190			47	23	87	5.2	31.5	74	1845	115			158	68	100	92	96		96		11										
8:00AM	4060	1125	74	97	21	16	230	180			47	22.7	87	6.3	31.3	74	1840	115			162	72	104	92	96		100		11										
10:00AM																																								
12:00AM	4100	1125	83	106	21	16	225	175			47	26	87	6.8	33.7	74	1835	117			165	78	113	95	99		105		11										
2:00PM	4100	1150	84	108	21	16	225	180			47	26	87	6.8	33.8	74	1840	116			166	79	114	95	99		107		11										
4:00PM	4100	1150	84	108	21	16	225	180			47	26	87	6.8	33.8	74	1835	116			165	78	114	97	101		105		11										
6:00PM	4100	1150	84	107	21	16	230	185			47	26	87	6.8	33.8	74	1835	117			163	74	114	97	101		102		11										
8:00PM	4100	1075	83	105	21	16	230	185			47	26	87	7.0	34	74	1840	114			164	76	113	97	100		102		11										
10:00PM	4000	1150	80	102	21	16	230	180			47	25.5	87	6.8	34	74	1840	114			162	79	108	94	98		102		11										
12:00PM	4000	1075	78	97	21	16	240	190			47	25	87	6.6	33.2	74	1840	116			158	66	106	94	97		94		11										
TOTALS			(80)	(103)																																			

REMARKS:

SHIFT	AUXILIARY	JR. OPERATOR
11 - 7	MORINGO	MAULDIN
7 - 3	PRINE	WADE
3 - 11		

80AL001



CONTROL ROOM LOG SHEET — R.D. MORROW STEAM PLANT — DATE 10-25-77

TIME	GENERATION GMW	GENERATION	GENERATION S.S. WHM	GENERATOR	GENERATOR COLD GAS TEMP	GENERATOR GEN. FIELD VOLTS	GENERATOR GEN. FIELD AMPS	GENERATOR MEGA-VARS	GENERATOR PHASE HIGH VOLTS	GENERATOR PHASE HIGH AMPS	TURBINE EHC PUMP # GPM	TURBINE THRUST BEARING TEMP.	TURBINE RE-HEAT TEMP.	TURBINE CONDENSER PRESS.
12 MN.		4206	347											
1 AM.	160	4373	305		57	140	760	-12	19.1	4900	6.5	100	977	1.2
2 AM.	160	4531	318		148	22	140	490	-29	19.0	4900	6.5	100	977	1.2
3 AM.	160	4691	291		147	122	140	490	-20	19.0	4900	6.5	100	972	1.2
4 AM.	160	4850	324		147	120	140	490	-18	19.0	4900	6.5	100	977	1.2
5 AM.	170	5018	296		149	118	140	490	-11	19.0	4900	6.5	100	977	1.2
6 AM.	196	5206	296		172	35.1	140	490	-7	19.2	4900	6.5	100	982	1.2
7 AM.								BUSY						
8 AM.	202	5711	2998		387	35.2	2200	6750	35	19.7	5800	6.5	1010	987	2.4
9 AM.	203	5911	2611		187	350	2050	6150	40	19.7	5800	6.5	1004	982	2.4
10 AM.	202	6113	2624		189	344	2050	6150	41	19.8	5800	6.5	1000	980	2.8
11 AM.	201	6314	2637		188	369	2100	6300	45	19.9	5800	6.5	994	996	3.0
12 N.	200	6512	2650		187	37.6	2100	6300	46	19.8	5800	6.5	989	968	3.0
1 PM.	200	6713	2664		195	36.9	2050	6150	38	20.0	5820	6.7	990	968	2.5
2 PM.	200	6917	2678		180	35.8	2000	6000	42	20.0	5820	6.7	988	968	2.4
3 PM.	200	7124	2691		194	36.2	2050	6000	41	20.0	5820	6.7	984	966	2.5
4 PM.	150	7305	2704		188									
5 PM.	68	7417	2715		101	333	1250	4500	22	19.7	3090	6.8	980	891	1.7
6 PM.	100	7517	2726		89	32.4	1220	4350	15	19.7	3000	6.8	990	901	1.7
7 PM.	100	7616	2736		99	32.6	1250	4500	20	19.7	3000	6.8	990	906	1.7
8 PM.	100	7716	2747		89	31.8	1150	4050	12	19.5	3000	6.7	1000	926	1.6
9 PM.	100	7816	2757		90	31.3	1150	4000	8	19.5	3000	6.7	1000	921	1.6
10 PM.	100	7916	2768		89	30.6	1120	3950	2	19.4	2950	6.6	1001	930	1.5
11 PM.	110	8026	2779		99	31.3	1150	4000	-3	19.4	3200	6.6	1005	933	1.6
12 MN.	108	8131	2790		94	32.1	1110	3970	-5	19.4	3104	6.6	1005	995	1.6
TOTAL		3826	299		3826									

TIME	M.B.F.P.T. BRG. TEMP PUMP #1	PUMP #2	AUX. COND. ABS PRESS.	STEAM PRESSURES TURBINE FIRST STAGE	HOT R.H.	DRUM	AIR & GAS PRESSURES A F.D. DISC. PRESS.	B F.D. DISC. PRESS.	A AIR HTR DIFF.	B AIR HTR DIFF.	WIND BOX	SEC. SH. OUT	PRI. SH. OUT	REHEAT	ECON. OUT	PRE-OP. OUT	H2O PRESS. FWBP SUCT. PSI	MBFP SUCT. PSI
12 MN.																		
1 AM.	110	122	1.5	2078	1776	1776	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
2 AM.	110	122	1.4	2060	1769	1769	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
3 AM.	110	122	1.4	2060	1769	1769	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
4 AM.	110	122	1.4	2060	1769	1769	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
5 AM.	109	122	1.5	2054	1769	1769	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
6 AM.	109	122	1.5	2091	1769	1769	23	23	1.8	2.2	-.2	26	34	38	32	6.8	60	191
7 AM.	111	122	1.6	2060	1772	1772	6.0	6.0	1.6	1.0	1.4	2.6	3.9	5.0	4.2	6.8	75	170
8 AM.																		
9 AM.	113	128	1.8	2398	1787	1791	7.0	7.0	2.8	3.4	2.0	2.8	3.7	4.2	4.0	7.7	75	165
10 AM.	114	128	1.8	2403	1789	1793	6.5	6.5	2.7	3.2	1.8	2.7	3.4	4.4	4.4	8.1	75	148
11 AM.	116	130	2.1	2400	1790	1794	6.5	6.5	2.8	3.2	2.0	2.9	3.8	4.2	4.4	8.2	75	148
12 N.	118	132	2.2	2399	1789	1795	6.3	6.3	2.8	2.9	1.8	2.9	3.6	4.2	6.3	8.1	75	150
1 PM.	120	134	2.3	2400	1786	1795	6.5	6.5	2.8	3.4	2.0	3.1	3.7	4.4	6.4	8.2	75	150
2 PM.	118	134	1.8	2398	1787	1795	6.0	6.0	2.6	3.0	2.0	2.9	3.6	4.2	6.3	8.4	75	155
3 PM.	116	130	1.9	2393	1793	1795	6.5	6.5	2.8	3.2	2.0	2.8	3.4	4.2	6.3	8.4	75	150
4 PM.	117	130	1.9	2400	1791	1795	6.5	6.5	2.8	3.2	2.0	2.9	3.6	4.0	6.10	7.8	75	145
5 PM.	112	123	1.5	2397	850	273	1.0	1.0	.8	1.0	.2	2.6	2.9	3.2	4.4	4.4	36	125
6 PM.	112	123	1.4	2400	843	271	1.0	1.0	.8	1.0	.2	2.6	2.8	2.8	4.2	4.8	36	125
7 PM.	111	128	1.3	2400	841	270	1.3	1.3	.8	.7	.1	2.5	2.8	2.8	4.1	4.0	34	122
8 PM.	110	124	1.2	2399	839	269	1.2	1.2	.7	.9	.1	2.5	3.0	2.8	4.0	4.2	34	141
9 PM.	109	121	1.3	2400	838	268	1.0	1.0	.7	.9	—	2.4	2.8	3.0	4.3	4.1	34	121
10 PM.	109	120	1.3	2400	836	267	1.3	1.3	.7	.8	—	2.5	2.9	2.6	4.0	3.9	34	120
11 PM.	108	120	1.3	2400	836	267	1.4	1.4	.8	1.0	.2	2.8	2.9	2.8	4.4	4.8	37	123
12 MN.	109	121	1.4	2395	834	267	1.2	1.2	.8	1.0	—	2.4	2.8	3.2	4.6	4.8	36	124

TIME	MILL CLASSIFIERS A-1 DIFF. TEMP.	A-2 DIFF. TEMP.	B-1 DIFF. TEMP.	B-2 DIFF. TEMP.	C-1 DIFF. TEMP.	C-2 DIFF. TEMP.	FLOW AIR	STEAM	F.W.	O2 EAST	WEST	DA. TEMP.
12 MN.	-	-	-	-	-	-						
1 AM.	9 -141	9 -141	9 -142	10 -149	8 -110	8 -111	679	1089	1091	4.0	5.0	271
2 AM.	9 -140	9 -142	9 -140	10 -147	7 -119	7 -110	674	1084	1077	4.0	4.9	277
3 AM.	9 -140	9 -140	9 -140	10 -146	7 -119	7 -110	681	1100	1083	4.2	4.8	277
4 AM.	9 -142	9 -140	9 -140	10 -147	7 -110	7 -110	677	1086	1086	4.0	4.8	277
5 AM.	9 -149	9 -149	9 -149	10 -146	7 -118	8 -119	674	1084	1096	4.0	4.8	277
6 AM.	11 -150	11 -150	11 -150	11 -150	10 -111	10 -117	820	1349	1372	3.9	4.6	277
7 AM.												
8 AM.	12 -147	12 -150	12 -150	13 -150	10 -149	10 -150	857	1402	1406	3.4	4.2	299
9 AM.	13 -148	13 -150	12 -150	13 -149	10 -149	10 -150	816	1397	1406	3.6	4.0	299
10 AM.	12 -149	12 -150	12 -150	12 -150	10 -150	10 -150	870	1401	1409	3.6	4.2	300
11 AM.	13 -148	13 -150	13 -149	14 -150	11 -150	11 -149	876	1401	1408	3.6	3.9	300
12 N.	13 -148	13 -150	13 -149	14 -149	10 -150	11 -149	877	1401	1418	4.0	4.0	300
1 PM.	13 -147	13 -149	13 -148	14 -149	11 -150	11 -149	877	1403	1417	4.1	4.1	300
2 PM.	13 -148	13 -149	12 -149	14 -150	10 -148	10 -150	874	1401	1411	4.0	4.0	300
3 PM.	13 -147	13 -149	12 -150	13 -148	10 -150	10 -150	872	1401	1409	3.9	3.8	300
4 PM.												
5 PM.	9 -149	9 -148	9 -150	10 -147			536	1153	1081	4.4	5.1	254
6 PM.	9 -150	9 -150	10 -150	11 -146			457	1058	1011	5.1	5.3	255
7 PM.	9 -150	9 -150	10 -150	11 -145			460	655	677	4.7	5.7	255
8 PM.	9 -150	9 -150	9 -150	10 -146	-	-	460	658	677	4.7	5.7	255
9 PM.	9 -150	9 -149	9 -150	10 -147	-	-	463	657	663	4.8	5.5	255
10 PM.	8 -150	8 -149	9 -149	9 -147	-	-	465	662	672	4.7	5.3	254
11 PM.	9 -149	10 -151	10 -150	10 -149	-	-	473	721	742	4.4	4.7	260
12 MN.	9 -149	9 -150	9 -149	10 -148	-	-	468	690	709	4.6	4.9	259

	GENERATION READINGS GMW	AUX. GMW	S.S. WHM		WELL PUMP E.T. METERS #1	#2	#3	#4	#5	TURB. VALVE TEST
END	8131	2790		81795						MAIN S.V. A B
BEGIN	4306	2495		81771						INTERCEPT REHEAT S.V. R L
DIFF	3825	295		24						

SHIFT	TURBINE VIBRATION READINGS GMW	#1 BRG	#2 BRG	#3 BRG	#4 BRG	#5 BRG	#6 BRG	M.B.F.P.T. #1 BRG	#2 BRG	#1 BRG	#2 BRG
DAY	202	.6	3.1	29	1.1	.8	.9	1.6	.7	2.2	1.6
NIGHT	160	.4	3.6	33	18	.5	.6	1.5	.5	2.2	1.6

DAILY FLOW INTEGRATORS	
STEAM	FEEDWATER
262319	265709
CONDENSATE	TOTAL COAL
21847	
SUPERHEAT SPRAY	FUEL OIL
6151	229

REMARKS:

SHIFT	OPERATOR	SUPERVISOR
DAY		
NIGHT		

R.D. MORROW SR. GENERATING PLANT

UNIT TWO

DATE 10-28-99

TIME	CORE MON. SCAVAGE RATE	MAIN COND. VAC	#1 HEATER SHELL PRESS	#1 HEATER SHELL TEMP	#1 HEATER COND OUT TEMP	C/D OIL PRESS A-1	C/D OIL PRESS A-2	C/D OIL PRESS B-1	C/D OIL PRESS B-2	C/D OIL PRESS C-1	C/D OIL PRESS C-2	AIR LEAKAGE A AUX	AIR LEAKAGE B AUX	OIL COOLER IN TEMP	OIL COOLER OUT TEMP	THRUST BRG TEMP	M.F.P.T. H/P BRG TEMP	M.F.P.T. FILTER IN PRESS	M.F.P.T. FILTER OUT PRESS	M.F.P.T. CONT OIL PRESS	M.F.P.T. HYD OIL PRESS	M.F.P.T. SUCT PRESS	M.F.P.T. DISCH PRESS	MAIN OIL COOLER A OUT TEMP	MAIN OIL COOLER A OUT PRESS	MAIN OIL COOLER B OUT TEMP	MAIN OIL COOLER B OUT PRESS	MAIN OIL COOLER C OUT TEMP	MAIN OIL COOLER C OUT PRESS	OIL IN TEMP	OIL OUT TEMP	AUX. COND. COND PUMP PRESS	AUX. COND. COND VAC	AUX. COND. EXH HOOD TEMP	AUX. COND. CIRC WATER IN TEMP	AUX. COND. CIRC WATER OUT TEMP	AUX. COND. CIRC WATER IN PRESS	AUX. COND. CIRC WATER OUT PRESS	VAC GLAND STEAM COND.	FULL H2 0 + 1%
2:00AM	90	-27	-27	124	122	8	-3	5	9			3900	1100	122	108	115	122	57	55	64	222	135	2525	85	27	92	29	85	30	134	112	25	-30	94	79	88	21	18	-15	
4:00AM	90	-27	-27	124	122	8	3	5	9			3950	1100	122	108	115	122	57	55	64	222	135	2525	85	27	87	28	85	30	134	112	25	-30	94	78	88	21	18	-15	
6:00AM	90	-27	-26	128	124	9	3	5	10			4000	1150	122	109	115	122	57	55	64	222	140	2600	86	27	83	28	85	30	134	112	25	-29	98	79	92	21	18	-16	
8:00AM							BUSY		FIRE		SYSTEM																													
10:00AM	90	-27	-25	136	131	7	3	4	8	0	0	4100	1050	126	115	119	126	57	55	64	221	140	2600	90	27	88	28	90	30	138	116	25	-29	104	84	97	23	18	-15	
12:00AM	90	-27	-25	140	137	7	2	4	7	0	0	4100	1050	130	119	124	130	57	55	64	221	140	2600	94	27	92	28	94	30	142	119	25	-29	110	89	102	26	18	-15	
2:00PM							BUSY		Feeder		Trip																													
4:00PM							BUSY		OPERATOR		ABS	ST	- SWAPPING	W/	15	+	RATA	TESTING																						
6:00PM	90	-27	-27	120	117	7	2	4	7	—	—	4100	900	122	112	117	122	57	55	64	222	120	2450	87	27	84	28	87	30	137	115	25	-30	95	82	89	22	18	-14	
8:00PM	90	-27	-27	120	117	7	3	5	8	-	-	4050	925	120	110	115	120	57	55	64	222	120	2450	86	28	83	28	86	30	136	113	25	-30	93	80	88	20	18	-14	
10:00PM	90	-28	-27	117	116	7	3	5	8	—	—	4050	900	119	108	114	119	57	55	64	222	120	2460	84	28	81	28	84	30	135	112	25	-30	92	78	86	20	19	-14	
12:00PM	90	-28	-27	119	116	8	3	6	9	—	-	4050	900	119	108	114	119	57	55	64	222	120	2450	86	28	84	28	86	30	135	113	25	-30	94	80	84	21	19	-14	

A

TIME	BOWSERS MAIN FILTER ΔP	BOWSERS RFPT FILTER ΔP	MAIN CONDENSER CIRC WATER OUTLET TEMP	MAIN CONDENSER HOTWELL LEVEL	MAIN CONDENSER CIRC WATER IN PRESS	MAIN CONDENSER CIRC WATER OUT PRESS	COND PUMP DISCH PRESS	HTR DRN PUMP PRESS	SERV WATER PRESS	AIR REG. PRESS	AUX. CIRC. WATER PRESS	H2 GENERATOR MECH GAS PRESS	H2 GENERATOR PURITY	H2 GENERATOR FAN DIFF	H2 GENERATOR SEAL OIL PRESS	H2 GENERATOR SEAL OIL PUMP PRESS	EHC SYS. DISCH PRESS	EHC SYS. DISCH TEMP	EHC SYS. FILTER 1 DIFF	EHC SYS. FILTER 1 & 2 DIFF	FWBP DISCH PRESS	FWBP SUCT PRESS	FWBP SEAL WATER TEMP	FWBP OIL TEMP IN B	FWBP OIL TEMP OUT B	SUBFP DISH PRESS	SUBFP SUCT PRESS	SUBFP OIL TEMP IN B	SUBFP OIL TEMP OUT B	SUBFP OIL PUMP PRESS	AIR COMPRESSOR A/B	AIR COMPRESSOR A/B	AIR COMPRESSOR A/B	AIR COMPRESSOR A/B	DEW POINT	AIR DRYERS TANK PRESS A	AIR DRYERS TANK PRESS B	AIR DRYERS CFM OUT PURGE FLOW	AIR DRYERS CFM OUT OUTLET FLOW	COALESCER DIFF PRESS A/	COALESCER DIFF PRESS B/
2:00AM	4000	1100	79	97	21	16	245	200			47	25	87	6.6	33	74	1840	114			156	60	103	94	97		90			11										
4:00AM	4000	975	78	97	21	16	245	200			47	25	87	6.6	33	74	1840	114			156	60	103	94	97		90			11										
6:00AM	4050	1125	79	101	21	16	230	190			47	25	87	6.6	33	74	1840	115			164	74	107	94	97		102			11										
8:00AM																																								
10:00AM	4150	1125	84	107	21	16	225	180			47	25	87	6.7	33	74	1840	115			166	78	112	93	97		105			11										
12:00AM	4175	1125	88	112	21	16	225	180			47	25.5	87	6.7	33	74	1840	117			166	78	119	97	100		106			11										
2:00PM																																								
4:00PM																																								
6:00PM	4150	850	82	94	21	16	240	200			47	24.5	87	6.5	32.3	74	1840	119			137	35	100	97	100		68			11										
8:00PM	4100	840	80	92	22	16	260	220			47	24	87	6.5	32	74	1840	118			137	35	98	96	100		68			11										
10:00PM	4100	825	78	91	21	16	260	220			47	24	87	6.5	32	74	1840	113			142	39	97	95	98		71			11										
12:00PM	4100	800	80	93	21	16	260	220			47	24	87	6.5	32	74	1840	113			138	35	98	95	98		68			11										
TOTALS																																								

REMARKS:

SHIFT	AUXILIARY	JR. OPERATOR
11 - 7	MOTLEY	MAULDIN
7 - 3		
3 - 11		

ROM1001

R.D. MORROW SR. GENERATING PLANT

UNIT Two

DATE 10-28-99

TIME	TURBINE GMW	TURBINE ACTIVE THRUST PRESS.	TURBINE INACT. THRUST PRESS.	DISSOLVED OXYGEN COND. DISCH	DISSOLVED OXYGEN DA	PRECIPITATION HEATER DRIPS	PRECIPITATION GROUNDED TW'S	BUNKERS SMOKE A	BUNKERS SMOKE B	BUNKERS SMOKE C	BURNERS IN SERVICE	AIR HEATERS THRUST BRG TEMP	AIR HEATERS GUIDE BRG TEMP	AIR HEATERS THRUST BRG TEMP	AIR HEATERS GUIDE BRG TEMP	DEAERATOR TEMP	DEAERATOR PRESS	A/B HEATER SHELL PRESS	A/B HEATER SHELL TEMP	A/B HEATER DRIP TEMP	A/B HEATER	A/B HEATER SHELL PRESS	A/B HEATER SHELL TEMP	A/B HEATER DRIP TEMP	A/B HEATER F.W. OUT TEMP	MAIN TURBINE LA THRUST	MAIN TURBINE ACT THRUST	MAIN TURBINE #1 BRG	MAIN TURBINE #2 BRG	MAIN TURBINE #3 BRG	MAIN TURBINE #4 BRG	MAIN TURBINE #5 BRG	MAIN TURBINE #6 BRG	MAIN TURBINE BRG OIL PRESS	STEAM SEAL PRESS	ECH HOOD TEMP
2:00AM	160			58	62	81	166.1					62	112	84	70	58		440	470	460	475	195	470	312	420	138	140	141	160	144	126	143	134	26	1.5	105
4:00AM	160			56	61	81	167.5					58	108	82	68	58		440	470	400	475	195	410	312	420	137	140	141	160	144	121	143	134	26	1.5	105
6:00AM	175			59	67	95	167.8					58	108	82	68	59		510	480	412	485	235	410	320	420	138	140	140	160	144	126	143	134	26	2.0	108
8:00AM	202			65	74	123	160.7				Busy																									
10:00AM	202			67	75	111	158.7					72	100	86	85	77		565	490	420	495	265	415	330	425	143	145	144	169	146	130	146	140	26	1.4	115
12:00AM	200			62	71	109	168.1					81	107	90	90	78		565	480	420	495	268	415	332	425	147	148	147	167	148	133	148	142	26	1.4	118
2:00PM											Busy																									
4:00PM											Busy																									
6:00PM	100			26	33	84	165.2					84	122	94	87	33		270	415	363	425	109	400	273	375	140	141	147	160	144	128	145	138	26	1.2	98
8:00PM	100			28	35	85	165.8					74	114	91	79	33		270	415	363	425	105	400	270	375	138	140	145	159	142	128	144	136	26	1	97
10:00PM	111			28	34	85	159.0					64	108	86	70	37		300	425	370	432	120	402	275	380	136	139	144	158	142	126	143	135	26	1.5	96
12:00PM	100			24	32	82	153.3					60	104	84	67	33		270	420	362	424	105	400	270	375	138	140	145	159	143	127	143	135	26	1	97

TIME	A/B HEATER SHELL PRESS	A/B HEATER SHELL TEMP	A/B HEATER DRIP TEMP	A/B HEATER COND OUT TEMP	B/C HEATER SHELL PRESS	B/C HEATER SHELL TEMP	B/C HEATER DRIP TEMP	B/C HEATER COND OUT TEMP	MILL/COAL FEEDER READINGS A-1	A-2	B-1	B-2	C-1	C-2	TARGETS 4160V	TARGETS 480V	A MILL MAPS A	A MILL MAPS B	A MILL MAPS C	B MILL MAPS A	B MILL MAPS B	B MILL MAPS C	C MILL MAPS A	C MILL MAPS B	C MILL MAPS C	P.A. FAN HI AMP H COOLERS A	B	C	A TEMP	B OUT TEMP	C OUT TEMP	D OUT TEMP	AIR LEAKAGE A MAIN	B MAIN
2:00AM	21	326	196	250	-14	190	134	180	2292003	99504841	37470426	22413127	27653883	42546250			90	90	89	92	93	92	92	94	92	45	45	37	86	84	84	85		
4:00AM	21	320	195	250	-14	190	134	180	2330040	99542508	37508861	22444209	27691654	42584046			90	90	89	92	93	92	92	94	92	43	43	37	86	84	84	84		
6:00AM	27	325	200	255	-12	185	138	184	2362040	99574212	37534790	22476600	27723098	42615713			88	89	88	91	92	90	92	94	92	46	45	40	87	85	85	85		
8:00AM	30	315	206	263	-10	190	144	190	2403890	99635302	37591648	22539112	27778735	42674681		BUSY																		
10:00AM	30	315	207	265	-10	194	148	190	2477822	99688806	37605812	22594128	27833515	42732480			87	88	87	90	90	89	91	92	90	48	47	42	95	93	92	93		
12:00AM	30	315	210	265	-9	195	153	194	2541794	99715015	37715887	22660219	27894397	42784912			87	88	87	90	90	89	91	92	90	47	47	42	99	96	96	98		
2:00PM																Busy																		
4:00PM																Busy																		
6:00PM	11	290	180	235	-19	175	127	168	2671085	99880381	37844113	22779776	-	-			87	88	87	90	90	89	-	-	-	42	44	-	90	87	86	89		
8:00PM	9.5	300	178	232	-19	161	125	166	2722446	99931218	37894389	22841224					88	89	87	90	91	90				43	43		87	85	85	86		
10:00PM	11	305	180	234	-19	161	123	167	2767669	99976035	37946202	22887680					88	89	88	90	91	90				44	43		85	82	82	83		
12:00PM	9.5	305	177	230	-19	162	123	166	2820977	00020779	37980148	22975721					88	89	88	90	91	90				41	41		87	85	85	85		
TOTALS																																		

REMARKS:

COAL FEEDER READINGS	
PRESENT COAL:	
PREVIOUS COAL:	
ADJUSTMENTS:	
TOTAL COAL BURNED:	

SHIFT	AUXILIARY	JR. OPERATOR
11 – 7	MOZINGO	MAULDIN
7 – 3	Prince	L. Wallace
3 – 11	Roberson	Dudley

aster Minder Data Log Period: 1 Hour

riod beginning: 1:00 pm Wednesday October 27, 1999
ried ending: 2:00 pm Wednesday October 27, 1999

ecipitator data:

RECIPITATOR TIME ON OPACITY

100.00% 9%

e data:

DR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DECR ON	ESP PWR
1	100.00%	84	205	353	25.4	53	73	8.9
2	100.00%	53	186	277	22.5	40	69	6.2
3	100.00%	73	209	436	26.4	43	76	11.5
4	100.00%	52	198	279	21.6	50	75	6.0
5	100.00%	78	201	479	23.2	41	83	11.1
6	100.00%	107	212	673	22.5	24	92	19.6
7	100.00%	89	220	559	23.1	35	86	12.9
8	100.00%	33	148	149	19.7	62	57	2.9
9	100.00%	109	228	972	21.9	4	94	21.2
0	100.00%	49	176	230	13.6	54	68	3.1
1	100.00%	54	164	276	21.3	54	65	5.8
2	100.00%	62	167	340	18.1	47	71	6.1
3	100.00%	45	192	228	23.9	55	67	5.3
4	100.00%	26	148	109	21.8	62	55	2.3
5	100.00%	73	216	444	25.5	39	84	11.8
6	100.00%	114	231	787	24.2	31	95	19.0
7	100.00%	24	138	119	18.6	68	54	2.2
8	100.00%	107	222	568	23.6	10	85	17.2

aster Minder Data Log Period: 1 Hour

eriod beginning: 2:00 pm Wednesday October 27, 1999
eriod ending: 3:00 pm Wednesday October 27, 1999

recipitator data:

RECIPITATOR	TIME ON	OPACITY
	100.00%	9%

c data:

DDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DMGR ON	ESP PWR
1	100.00%	87	207	371	25.5	53	74	9.4
2	100.00%	56	167	296	22.4	40	70	6.6
3	100.00%	70	211	457	26.8	42	77	12.2
4	100.00%	49	194	258	21.4	52	73	5.5
5	100.00%	77	193	475	23.1	41	82	10.9
6	100.00%	110	213	900	22.6	19	93	20.3
7	100.00%	92	223	579	23.3	35	87	13.4
8	100.00%	32	148	150	19.8	62	57	2.9
9	100.00%	109	228	988	22.1	5	94	21.3
10	100.00%	50	126	234	18.6	55	68	3.1
11	100.00%	80	159	252	21.0	55	63	5.2
12	100.00%	57	162	303	17.7	50	69	5.3
13	100.00%	41	188	198	23.7	58	65	4.6
14	100.00%	26	147	111	21.5	63	55	2.3
15	100.00%	74	217	452	25.8	33	84	11.6
16	100.00%	116	233	809	24.4	27	96	19.7
17	100.00%	27	140	131	18.9	62	56	2.4
18	100.00%	104	226	586	30.3	8	86	18.0

laster Minder Data Log Period: 1 Hour

eriod beginning: 3:00 pm Wednesday October 27, 1999
eriod ending: 4:00 pm Wednesday October 27, 1999

recipitator data:

RECIPITATOR TIME ON OPACITY

100.00% 9%

ve data:

ADDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DEGR ON	ESP PWR
1	100.00%	69	211	385	25.8	51	75	9.9
2	100.00%	61	193	328	23.0	39	72	7.5
3	100.00%	83	217	511	27.5	40	80	14.0
4	100.00%	53	199	281	21.7	50	75	6.0
5	100.00%	83	205	518	23.4	40	85	12.1
6	100.00%	113	217	937	22.7	14	94	21.2
7	100.00%	96	225	601	23.5	35	80	14.1
8	100.00%	32	146	149	19.8	60	57	2.9
9	100.00%	110	230	980	22.4	2	94	21.9
10	100.00%	60	173	240	13.8	54	69	3.3
11	100.00%	54	163	275	21.3	53	65	5.8
12	100.00%	61	168	331	18.0	47	71	5.9
13	100.00%	45	192	216	28.9	56	67	5.1
14	100.00%	29	153	127	21.9	62	57	2.7
15	100.00%	74	222	478	26.5	31	86	12.6
16	100.00%	121	236	848	24.7	23	97	20.8
17	100.00%	27	140	131	18.9	61	56	2.4
18	100.00%	103	224	535	30.2	6	88	17.9

Master Minder Data Log Period: 1 Hour

Period beginning: 4:00 pm Wednesday October 27, 1999
Period ending: 5:00 pm Wednesday October 27, 1999

Precipitator data:

PRECIPITATOR	TIME ON	OPACITY
A	100.00%	0%

ave data:

ADDR	TIME ON	ACA	ACV	DCMA	DCKV	SPRK MIN	DEGR ON	ESP PWR
1	100.00%	89	218	361	26.1	52	76	9.9
2	100.00%	61	193	325	23.0	39	72	7.4
3	100.00%	86	229	534	28.0	38	81	14.9
4	100.00%	58	208	321	22.1	48	77	7.0
5	100.00%	89	211	568	23.8	38	88	13.5
6	100.00%	110	213	900	22.5	16	93	20.2
7	100.00%	94	224	591	23.4	35	88	13.8
8	100.00%	33	148	152	19.6	51	57	2.9
9	100.00%	110	229	978	22.5	2	94	22.0
10	100.00%	48	180	233	14.0	55	69	3.2
11	100.00%	52	163	264	21.4	54	64	5.6
12	100.00%	63	168	344	18.2	48	72	6.2
13	100.00%	47	196	229	24.1	55	68	5.5
14	100.00%	32	159	145	22.3	61	59	3.2
15	100.00%	79	224	487	26.8	29	86	13.0
16	100.00%	122	238	858	24.8	19	98	21.2
17	100.00%	23	133	110	16.5	62	53	2.0
18	100.00%	104	213	627	22.8	32	89	14.2

Master Minder Data Log Period: 1 Hour

Period beginning: 9:00 am Thursday October 28, 1999
Period ending: 10:00 am Thursday October 28, 1999

Precipitator data:

PRECIPITATOR	TIME ON	OPACITY
A	100.00%	9%

Avc data:

ADDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DEGR ON	ESP PWR
1	100.00%	59	200	823	25.1	54	71	8.1
2	100.00%	57	191	302	22.9	40	70	6.9
3	100.00%	77	212	483	26.0	41	77	12.0
4	100.00%	51	197	271	21.5	50	78	5.8
5	100.00%	76	201	478	23.1	41	82	11.0
6	100.00%	111	215	907	22.6	20	93	20.4
7	100.00%	91	221	563	23.0	36	86	12.9
8	100.00%	31	146	141	19.5	62	55	2.7
9	100.00%	111	229	981	21.6	1	94	21.1
10	100.00%	41	185	187	13.1	80	64	2.4
11	100.00%	45	154	220	20.8	57	61	4.5
12	100.00%	69	164	316	17.8	49	70	5.6
13	100.00%	39	184	181	23.6	59	63	4.2
14	100.00%	24	144	99	21.4	63	53	2.1
15	100.00%	87	209	468	24.7	37	80	9.0
16	100.00%	114	231	782	24.2	30	94	18.9
17	100.00%	23	132	108	18.5	63	53	1.9
18	100.00%	116	223	713	23.6	26	92	16.3

Master Minder Data Log Period: 1 Hour

Period beginning: 10:00 am Thursday October 26, 1999
Period ending: 11:00 am Thursday October 28, 1999

Precipitator data:

PRECIPITATOR	TIME ON	OPACITY
A	100.00%	8%

Avg data:

ADDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DEGR ON	RSP PWR
1	100.00%	86	207	366	25.4	52	73	9.2
2	100.00%	69	201	381	23.3	37	75	6.8
3	100.00%	86	216	525	26.4	37	80	12.8
4	100.00%	80	205	327	22.0	46	78	7.1
5	100.00%	68	206	519	23.3	40	84	12.0
6	100.00%	118	216	927	22.6	14	98	20.9
7	100.00%	92	222	574	25.0	36	86	13.2
8	100.00%	23	141	124	19.4	65	53	2.4
9	100.00%	110	229	980	21.7	2	94	21.2
10	100.00%	49	175	226	18.6	67	67	3.1
11	100.00%	56	163	276	21.2	53	64	5.8
12	100.00%	70	172	391	18.4	44	74	7.1
13	100.00%	48	196	288	24.1	56	68	5.7
14	100.00%	50	153	132	21.7	62	57	2.8
15	100.00%	74	216	448	25.7	53	88	11.5
16	100.00%	119	234	825	24.4	24	96	20.1
17	100.00%	29	143	147	18.9	62	57	2.7
18	100.00%	118	225	740	23.8	22	93	17.2

Master Minder Data Log — Period: 1 Hour

Period beginning: 11:00 am Thuraday October 28, 1999
Period ending: 12:00 pm Thursday October 28, 1999

Precipitator data:

PRECIPITATOR	TIME ON	OPACITY
1	100.00%	8%

ive data:

ADDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	INTER ON	ESP PWR
1	100.00%	71	211	396	25.7	50	75	10.1
2	100.00%	74	203	416	23.3	36	77	9.6
3	100.00%	91	226	672	27.0	35	82	15.4
4	100.00%	62	208	342	22.2	47	78	7.5
5	100.00%	90	210	567	23.6	37	86	13.3
6	100.00%	113	215	931	22.6	17	93	21.0
7	100.00%	91	220	565	22.8	36	85	12.8
8	100.00%	25	136	105	19.2	61	51	2.0
9	100.00%	107	227	943	21.8	9	92	20.5
10	100.00%	51	178	242	13.7	54	68	3.3
11	100.00%	59	167	304	21.5	51	86	6.5
12	100.00%	69	171	382	16.3	44	73	6.9
13	100.00%	50	198	247	24.2	54	69	5.9
14	100.00%	30	154	131	21.9	62	57	2.8
15	100.00%	75	218	458	26.8	32	84	11.6
16	100.00%	118	233	816	24.3	29	95	19.8
17	100.00%	27	140	136	18.8	61	55	2.5
18	100.00%	118	223	718	23.1	26	92	16.5

Master Minder Data Log Period: 1 Hour

Period beginning: 12:00 pm Thursday October 28, 1999
Period ending: 1:00 pm Thursday October 28, 1999

Precipitator data:

PRECIPITATOR	TIME ON	OPACITY
	100.00%	9%

VC data:

DDR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DSGS ON	ESP PWR
1	100.00%	72	211	401	25.6	50	75	10.2
2	100.00%	71	200	392	23.1	38	75	9.0
3	100.00%	92	223	581	27.3	35	82	15.8
4	100.00%	63	209	348	22.3	47	79	7.7
5	100.00%	80	211	571	23.7	37	86	13.5
6	100.00%	108	211	677	22.4	24	91	18.6
7	100.00%	88	218	544	22.6	37	84	12.2
8	100.00%	21	125	55	18.8	64	48	1.5
9	100.00%	109	229	965	22.3	6	96	21.5
10	100.00%	50	175	234	13.6	54	67	3.1
11	100.00%	57	165	290	21.3	52	66	6.1
12	100.00%	72	175	408	18.7	42	75	7.6
13	100.00%	49	198	244	24.3	54	68	5.9
14	100.00%	33	159	148	22.4	62	59	3.3
15	100.00%	74	217	450	25.8	33	88	11.6
16	100.00%	116	230	787	24.2	30	96	19.0
17	100.00%	27	138	132	18.7	62	55	2.4
18	100.00%	111	220	879	22.8	30	90	15.5

eater Minder Data Log Period: 1 Hour

eriod beginning: 1:00 pm Thursday October 28, 1999
eriod ending: 2:00 pm Thursday October 28, 1999

ecipitator data:

RECIPITATOR TIME ON OPACITY

100.00% 9%

e data:

DR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DEGR ON	BSP PWR
1	100.00%	72	213	406	25.9	50	76	10.5
2	100.00%	73	202	406	23.3	37	76	9.4
3	100.00%	93	236	548	27.7	34	82	16.2
4	100.00%	65	213	365	22.8	45	80	8.2
5	100.00%	94	214	599	23.9	36	87	14.3
6	100.00%	110	213	897	22.5	22	92	20.1
7	100.00%	88	217	541	22.6	37	84	12.2
8	100.00%	19	124	74	15.4	61	46	1.3
9	100.00%	110	229	975	22.5	4	93	21.9
0	100.00%	51	178	240	13.8	54	88	3.3
1	100.00%	57	165	293	21.4	52	65	6.2
2	100.00%	73	176	415	18.8	42	76	7.8
3	100.00%	53	203	268	24.6	53	70	6.5
4	100.00%	34	160	150	22.4	60	59	3.3
5	100.00%	72	214	439	25.4	33	82	11.1
6	100.00%	112	229	786	24.1	31	93	18.5
7	100.00%	57	139	132	16.8	61	55	2.4
8	100.00%	112	220	668	23.0	30	90	16.7

aster Minder Data Log Period: 1 Hour

eriod beginning: 2:00 pm Thursday October 28, 1999
eriod ending: 3:00 pm Thursday October 28, 1999

recipitator data:

RECIPITATOR	TIME ON	OPACITY
	100.00%	8%

ro data:

DR	TIME ON	ACA	ACV	DCKA	DCKV	SPKS MIN	DEGR ON	ESP PWR
1	100.00%	71	213	396	26.1	50	75	10.3
2	100.00%	72	208	398	23.4	37	76	9.3
3	100.00%	92	224	580	27.8	34	82	15.1
4	100.00%	85	212	360	22.5	46	79	8.1
5	100.00%	82	214	595	23.9	37	87	14.2
6	100.00%	109	211	888	22.5	23	91	19.9
7	100.00%	88	216	529	22.6	58	80	11.9
8	100.00%	26	186	113	19.0	82	52	2.1
9	100.00%	110	229	974	22.5	4	93	21.9
0	100.00%	49	173	230	13.9	56	67	3.1
1	100.00%	58	183	267	21.4	54	68	5.7
2	100.00%	68	178	289	18.7	44	74	7.2
3	100.00%	49	200	245	24.5	54	69	6.0
4	100.00%	33	159	145	22.5	80	56	3.2
5	100.00%	73	215	444	25.6	33	83	11.3
6	100.00%	118	224	778	24.1	31	88	15.8

16.1

acter Minder Data Log Period: 1 Hour

eriod beginning: 3:00 pm Thursday October 28, 1999
eriod ending: 4:00 pm Thursday October 28, 1999

recipitator data:

RECIPITATOR	TIME ON	OPACITY
	100.00%	8%

vc data:

ODR	TIME ON	ACA	ACV	DCMA	DCKV	SPKS MIN	DEGR ON	RSP PWR
1	100.00%	70	212	390	25.9	51	74	10.1
2	100.00%	69	200	376	23.2	37	74	8.7
3	100.00%	93	225	682	28.0	35	62	16.2
4	100.00%	67	215	378	22.7	45	61	8.5
5	100.00%	97	217	629	24.1	35	89	15.1
6	100.00%	110	212	695	22.4	22	91	20.0
7	100.00%	85	214	518	22.5	38	82	11.6
8	100.00%	29	140	127	19.1	64	53	2.4
9	100.00%	108	226	955	22.4	9	93	21.3
10	100.00%	49	177	230	13.9	55	67	3.1
11	100.00%	57	166	293	21.5	52	65	6.2
12	100.00%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

14	100.00%	37	164	170	22.8	58	61	3.6
15	100.00%	75	217	455	25.8	32	83	11.7
16	100.00%	113	229	772	24.1	30	93	18.6
17	100.00%	29	141	144	18.8	63	56	2.7
18	100.00%	114	221	701	23.1	28	91	16.1

APPENDIX C
RAW TEST DATA

FGD INLET

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

			Stack Conditions					
Client	SMEPA		Assumed	Actual	Meter Box ID	8		
W.O.#	11634.001.002				Meter Box Y	.9999		
Project ID	SMEPA	% Moisture	5%		Meter Box Del H	1.6955	Leak Checks	Initial / Mid-Point / Final
Mode/Source ID	U2 FGD	Impinger Vol (ml)		~~91~~ 110 / 116	Probe ID / Length	10'	Sample Train (ft^3)	.007 / / .006
Samp. Loc. ID	IN	Silica gel (g)		13.3	Probe Material	Boro	Leak Check @ (in Hg)	15 / / 10
Run No.ID	1	CO2, % by Vol	6.0	~~9~~ 10 / 11.2	Pitot / Thermocouple ID	P / R301	Pitot good	(yes) / no / yes / no / yes / no
Test Method ID	OHM	O2, % by Vol	8.5	~~78~~ 07.3	Pitot Coefficient	0.84	Orsat good	(yes) / no / yes / no / yes / no
Date ID	26OCT1999	Temperature (°F)	320		Nozzle ID	.190	Temp Check	Pre-Test Set / Post-Test Set
Source/Location	UNIT 2 FGD Inlet	Meter Temp (°F)	85		Avg Nozzle Dia (in)	.196	Meter Box Temp	79 / 82
Sample Date	10/27/99	Static Press (in H_2O)	-1.65	-1.65	Area of Stack (ft^2)	100	Reference Temp	78 / 80
Baro. Press (in Hg)	29.74				Sample Time	125	Pass/Fail (+/- 2°)	(Pass) / Fail / Pass / Fail
Operator	JP/TB/DM	Ambient Temp (°F)	76		Total Traverse Pts	25	Temp Change Response	(yes) / no / yes / no

K Factor 0.817

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1350S			585.824									
A 2	5		.99	0.80	589.0	299	86	84	260	271	65	5.0	258	
3	10		1.1	0.84	591.8	335	85	83	260	265	65	5.0	260	
4	15		1.1	0.89	594.5	342	87	87	260	264	66	5.0	265	
5	20		1.1	0.89	597.4	338	88	85	260	268	65	5.0	265	
	25	1420	0.97	0.79	600.480	331	89	84	260	262	65	5.0	264	14.646
					14.6460	L.C. good @ 10in Hg								
B 1	0	1426			600.565									
2	5		1.2	0.98	603.5	320	88	85	260	264	65	5.0	265	
3	10		1.1	0.89	606.4	331	89	86	260	267	66	5.0	260	
4	15		1.1	0.89	609.2	338	90	86	255	267	61	5.0	260	
5	20		1.1	0.89	612.0	344	91	87	260	267	60	5.0	260	
	25	1451	0.97	0.79	614.605	305	92	87	260	262	60	5.0	260	
					14.0400	L.C good @ 8in Hg								14.040
C 1	0	1458			614.696									
2	5		1.0	0.81	617.6	329	88	86	260	268	64	5.0	260	
3	10		1.1	0.89	620.3	332	89	86	260	264	66	5.0	261	
4	15		1.2	0.98	623.4	340	90	87	260	264	60	5.0	261	
5	20		1.2	0.98	626.3	345	92	86	260	264	60	5.0	261	
	25	1523	1.1	0.89	629.128	325	92	88	260	263	60	5.0	260	
					14.4320									14.432
						L.C	good @	8in Hg						
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts 329.56	Avg Tm 86.56		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	

Avg Sqrt Del H

Comments:

Ontario Hydro Method

WESTON MANAGERS DESIGNERS/CONSULTANTS

ISOKINETIC FIELD DATA SHEET — Ontario Hydro Method - Mercury

Client: SMEPA | Operator: JP/SD/JM
Source: UNIT 2 FGD | Run No.: 1
Sample Loc.: Inlet | Date: 10/27/99 | K Factor: 0.817

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1528			629.234									
D 2	5		1.0	0.81	632.2	320	89	87	260	267	63	5.0	260	
3	10		1.2	0.98	635.2	327	90	87	260	269	59	5.0	261	
4	15		1.2	0.98	638.2	336	92	88	260	268	59	5.5	260	
5	20		1.2	0.98	641.2	342	92	88	260	263	59	5.5	260	
	25	1551	1.2	0.98	644.325	329	93	89	260	263	60	5.5	260	
					15.1410		LC good @ 9 in Hg							15.141
E 1	0	1558	1.07		644.461									
2	5		1.1	0.89	647.9	320	91	89	261	262	63	5.5	260	
3	10		1.1	0.89	650.8	321	93	87	260	260	60	5.5	261	
4	15		1.2	0.98	653.8	329	92	88	260	269	60	5.5	261	
5	20		1.3	~~0.89~~ 1.06	657.0	336	93	89	260	263	60	5.5	260	
	25	1623	1.3	1.06	660.374	325	94	90	260	261	61	5.5	261	15.913
					15.9130									
	Avg Sqrt Delta P: 1.05987			Avg Delta H: 0.9144 (0.911)	Total Volume: 74.1720	Avg Ts: 329.56	Avg Tm: 88.56		Min/Max: 255/261	Min/Max: 24/26	Max Temp: 66	Max Vac: 5.5	Max Temp: 265	
				Avg Sqrt Del H: 0.9554 (0.954)	Comments: CLS									

ISO - 103.42
MOIST - 7.92
SCFM - 261228.21 RS
SVOL - 71.0819

WESTON MANAGERS DESIGNERS/CONSULTANTS

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

			Stack Conditions Assumed	Stack Conditions Actual					
Client	SMEPA				Meter Box ID	B			
W.O.#	11634.001.002				Meter Box Y	.9979			K Factor 0.85
Project ID	SMEPA	% Moisture	8		Meter Box Del H	1.6955	Leak Checks	Initial	Mid-Point / Final
Mode/Source ID	U2 FGD	Impinger Vol (ml)		98.1	Probe ID / Length	10'	Sample Train (ft^3)	.012	/ .004
Samp. Loc. ID	IN	Silica gel (g)		15.2	Probe Material	Boro	Leak Check @ (in Hg)	17	/ 17
Run No.ID	2	CO2, % by Vol	11	11.3	Pitot / Thermocouple ID	P302	Pitot good	yes / no	/ yes / no
Test Method ID	OHM	O2, % by Vol	8	6.9	Pitot Coefficient	0.84	Orsat good	yes / no	/ yes / no
Date ID	26OCT1999	Temperature (°F)	320		Nozzle ID	0.196	Temp Check	Pre-Test Set	Post-Test Set
Source/Location	UNIT 2 FGD - Inlet	Meter Temp (°F)	85		Avg Nozzle Dia (in)	0.196	Meter Box Temp	58	
Sample Date	10/28/99	Static Press (in H_2O)	-11.5	-13.8	Area of Stack (ft^2)	100	Reference Temp	55.6	
Baro. Press (in Hg)	29.80				Sample Time	125	Pass/Fail (+/- 2°)	Pass / Fail	/ Pass / Fail
Operator	JP / TB / JM	Ambient Temp (°F)	63		Total Traverse Pts	25	Temp Change Response	yes / no	/ yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	0902			660.813									
2	5		0.95	0.80	663.4	320	73	69	255	267	48	5.0	260	
3	10		1.1	0.93	666.3	324	74	70	255	265	48	5.0	261	
4	15		.97	0.82	669.0	331	74	70	255	263	48	5.0	261	
5	20		1.0	0.85	671.7	336	75	70	259	265	49	5.0	262	
	25	0927	.90	0.76	674.316	320	76	70	258	262	49	5.0	261	13.503
					13.5030	L.C good @ 8in Hg								
B 1	0	0931			674.401									
2	5		0.95	0.80	677.0	320	78	73	259	268	52	5.0	261	
3	10		1.1	0.93	679.7	326	79	74	259	267	51	5.0	261	
4	15		1.1	0.93	682.6	334	81	75	260	268	52	5.0	261	
5	20		1.1	0.93	685.4	340	82	77	262	265	52	5.0	261	
	25	0956	1.1	0.93	688.308	342	82	78	259	264	52	5.0	261	13.907
					13.9070									
						L.C good @ 8in Hg								
C 1	0	1000			688.401									
2	5		1.0	0.85	691.1	320	83	81	260	265	54	5.0	261	
3	10		1.1	0.93	693.9	327	86	83	252	268	55	5.0	261	
4	15		1.2	1.02	696.9	338	92	87	261	266	56	5.0	261	
5	20		1.1	0.93	699.7	343	95	89	267	263	56	5.0	261	
	25	1025	1.1	0.93	702.587	341	97	92	267	264	58	5.0	261	14.186
					14.1860									
							L.C Good @ 9in Hg							
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H	Comments:									

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Ontario Hydro Method

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Page ___ of ___

Client: SMEPA
Source: UNIT 2 FGD
Sample Loc.: Inlet
Operator: JP/TB/JM
Run No.: 3
Date: 10/28/99
K Factor: 0.85

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1214			777.800									
2	5		1.0	.85	780.4	320	102	100	260	268	60	5.0	260	
3	10		1.2	1.02	783.3	327	103	100	261	267	58	5.0	260	
4	15		1.3	1.10	786.5	338	104	100	261	263	57	5.0	260	
5	20		1.3	1.10	789.6	343	105	100	260	264	57	5.0	260	
	25	1239	1.2	1.02	792.151	327	105	100	263	260	59	5.0	261	
				total	14.851									
E 1	0	1442			792.725									
2	5		1.0	.85	795.4	320	103	100	261	264	61	5.0	261	
3	10		1.1	0.93	798.3	325	103	100	262	264	60	5.0	261	
4	15		1.2	1.02	801.3	330	104	100	262	264	61	5.0	260	
5	20		1.3	1.10	804.5	338	105	101	260	262	61	5.0	260	
	25	1507	1.3	1.10	807.701	339	105	101	260	260	60	5.0	260	
				total	14.9760									

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
1.0854	1.0000	73.8920 (~~75.872~~)	333	101	259/266	259/268	68	5	261

Avg Sqrt Del H: 0.9992

Comments:

ISO - 100.74
MOIST - 7.00
SCFM - 270128.51
SVOL - 71.2603

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SAMPLE RECOVERY FIELD DATA

Method OMM-5 Hg2O Method – Mercury

Client SMEPA W.O. # 11634.001.002

Location/Plant Morton Plant Source & Location FGD INLET

Run No. 1 **Sample Date** 10/27/99 **Recovery Date** 10/27/99

Sample I.D. SMEPA-U2FGD-INV-1-OHM-26OCT99 **Analyst** _____ **Filter Number** W-1

	Impinger						7	LQ	Sil gel
	1	2	3	4	5	6	~~Imp. Total~~	~~TOTAL~~	~~Total~~
Contents									
Final	774.5	643.8	756.0	630.1	604.2	710.3	724.2		313.3
Initial	695.2	623.4	753.1	623.4	602.0	706.3	724.0		300.0
Gain	79.3	20.4	3.9	6.7	2.2	4	0.2	116.7	13.3

Impinger Color 1-4 Clear Colorless Labeled? ✓ 130.0

Silica Gel Condition ½ Blue Sealed? ✓

Run No. 2 **Sample Date** 10/28/99 **Recovery Date** 10/28/99

Sample I.D. SMEPA-U2FGD-INV-2-OHM-26OCT99 **Analyst** _____ **Filter Number** W-3

	Impinger						7	LQ	Sil Gel
	1	2	3	4	5	6	~~Imp. Total~~	~~TOTAL~~	~~Total~~
Contents									
Final	787.4	628.9	756.3	627.9	604.4	709.9	725.0		315.2
Initial	709.2	614.8	754.3	624.2	602.1	709.6	725.0		300
Gain	78.2	14.1	2	3.7	0.3	0.3	0	98.6	15.2

Impinger Color 1-4 clear Labeled? ✓ 116.8

Silica Gel Condition ½ blue Sealed? ✓

Run No. 3 **Sample Date** 10/28/99 **Recovery Date** 10/28/99

Sample I.D. SMEPA-U2FGD-INV-3-OHM-26OCT99 **Analyst** _____ **Filter Number** W-2

	Impinger						7	LQ	Sil Gel
	1	2	3	4	5	6	~~Imp. Total~~	~~TOTAL~~	Total
Contents									
Final	732.4	680.5	591.8	704.2	687.2	715.2	714.4		313.2
Initial	654.3	664.2	589.0	700.8	686.7	714.3	715.6		300
Gain	78.1	16.3	2.8	3.4	.5	.9	-1.2	100.8	13.2

Impinger Color 1-4 clear Labeled? ✓ 114

Silica Gel Condition ½ Blue Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON MANAGERS DESIGNERS/CONSULTANTS

✓ CLS

BJ

SAMPLE RECOVERY FIELD DATA

Method Ontario Hydro Mercury

Client Southern Miss Power W.O. #

Location/Plant Morrow Point Source & Location FGD Inlet

Run No. BT Inlet BT Sample Date 10/28/99 Recovery Date 10/28/99

Sample I.D. SMPA-U2FGD-IN-BT-OHM-2600999 Analyst Filter Number ~~W~~

	Impinger								
	1	2	3	4	5	6	Imp.Total	~~7~~ Liq Total	Total
Contents			KCl						
Final	730.2	722.5	742.2	677.2	608.2	689.7	640.0		300
Initial	730.2	722.5	742.2	667.2	608.2	689.7	640.0		300
Gain	0	0	0	0	0	0	0	0	0

Impinger Color 1-4 clear Labeled? ✓

Silica Gel Condition good Sealed? ✓

Run No. Sample Date Recovery Date

Sample I.D. Analyst Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color Labeled?

Silica Gel Condition Sealed?

Run No. Sample Date Recovery Date

Sample I.D. Analyst Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color Labeled?

Silica Gel Condition Sealed?

Check COC for Sample IDs of Media Blanks

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BJV

Source Gas Analysis Data Sheet - Method 3

Client SMEPA Analyst JS

Location/Plant HATTIESBURG, MS Date 10/27/99

Source #2 INLET ~~Analytical Method (circle one)~~ Orsat

W.O. Number _____

Run Number 01 Leak Check Good? (circle one) (Yes) No

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		~~10.9~~ 11.2	18.6	7.4	
2		~~10.~~ 11.1	18.4	7.3	
3		11.2	18.4	7.2	
	Average	11.2	18.5	7.3	

Run Number 02 Leak Check Good? (circle one) (Yes) No DATE-10/28/99

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		11.3	18.1	6.8	
2		11.4	18.3	6.9	
3		11.2	18.2	7.0	
	Average	11.3	18.2	6.9	

Run Number 03 Leak Check Good? (circle one) (Yes) No DATE-10/28/99

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		11.3	18.2	6.9	
2		11.2	17.9	6.7	
3		11.3	18.1	6.8	
	Average	11.3	18.1	6.8	

Acceptable differences for repeat analysis:

if CO_2 > 4% than +/- 0.3%

if CO_2 < or = 4% than +/- 0.2%

if O_2 > or = 15% than +/- 0.2%

if O_2 < 15% than +/- 0.3%

Ambient Check

Oxygen 20.7

Carbon Dioxide 0.0

Report all values to the nearest 0.1 percent

Comments _____

√LLS

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Determination of Moisture Content in Stack Gases - Method 4

Client SMEDA
Location/Plant HATTIESBURG, MS
Source #2 Inlet
Operator JP/TB
Meter Box ID 12
Date 10/27/99
Meter Box Y 1.009
W.O. Number _____
Temperature °C or °F F°
Sample Volume, ft³ or L ft³

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Meter Temp (or ambient temp for rotometer) Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
PRELIM										Initial _____
	End Test	1140	953.126							Final _____
Baro Press., Pb (in Hg)	Start Test	1102	929.172	79	78	1.5			Moisture Volume, Vw(std)	Percent Moisture (%), BWS
	Avg. or Total									

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Meter Temp (or ambient temp for rotometer) Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
										Initial _____
	End Test	1222	976.456	89	86	1.8	272	306		Final _____
Baro Press., Pb (in Hg)	Start Test	1152	953.318	96	95	1.5	200	300	Moisture Volume, Vw(std)	Percent Moisture (%), BWS
29.74	Avg. or Total		23,138	91.5		1.65	24	6		

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Meter Temp (or ambient temp for rotometer) Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
										Initial _____
	End Test									Final _____
Baro Press., Pb (in Hg)	Start Test								Moisture Volume, Vw(std)	Percent Moisture (%), BWS
	Avg. or Total									

$$Vm(std) = \frac{17.64 * Y * Vm * (Pb + (deltaH / 13.6))}{(Tm + 460)}$$

if Tm is C° than $Tm = (Tmc * 1.8) + 32$

if Vm is liters than $Vm = Vml * 28.32$

$$Vw(std) = (0.04707 * Vwc) + (0.04715 * Wwsg)$$

$$BWS = \left(\frac{Vw(std)}{Vw(std) + Vm(std)} \right) * 100$$

WHERE:
Vm(std)= Sample volume corrected to standard temp and pressure, scf or L
Vm= Actual sample volume, calculated, scf
Vml= Actual sample volume, calculated, Liters
Y= Dry gas meter calibration factor.
Pb= Barometric pressure, in. Hg
delta H= Meter pressure, in H2O
Tm= Average temperature of meter (DGM is used) or rotomter, degrees °I
Tmc= Average temperature of meter (DGM is used) or rotomter, degrees °
Vw(std)= Volume of water vapor at standard conditions, scf or L
Vwc= Volume of water condensed, mL
Wwsg= Weight of Silica Gel, g
Bws= Water vapor in gas stream, percen

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Use either ft³ or liters in calculations. DO NOT MIX CUBIC FEET AND LITERS IN ANY CALCULATION.

✓ LG

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Sample and Velocity Traverse Point Data Sheet - Method 1

Client SMEPA
Loaction/Plant Hattiesburg MS
Source #2 Scrubber Inlet

Operator JP/TB
Date 10/27/99
W.O. Number

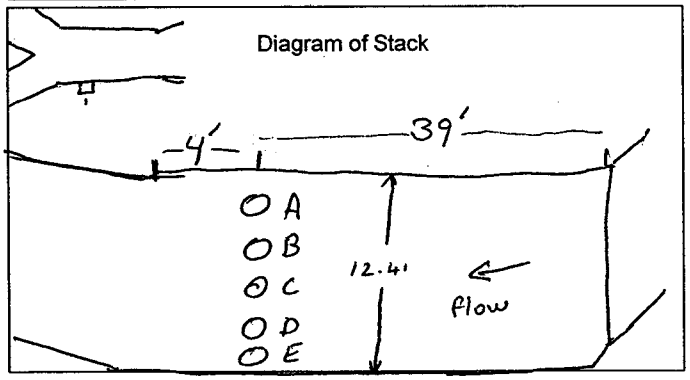
Duct Type	☐ Circular	☑ Rectangular Duct	Indicate appropriate type
Traverse Type	☑ Particulate Traverse	☐ Velocity Traverse	

Distance from far wall to outside of port (in.) = C	118
Port Depth (in.) = D	18
Depth of Duct, diameter (in.) = C-D	100
Area of Duct (ft²) ~~JP 122.0 TB 121.67~~	~~14900~~ 100.0
Total Traverse Points	25
Total Traverse Points per Port	5

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	144 ~~149~~
Total Ports (rectangular duct only)	5

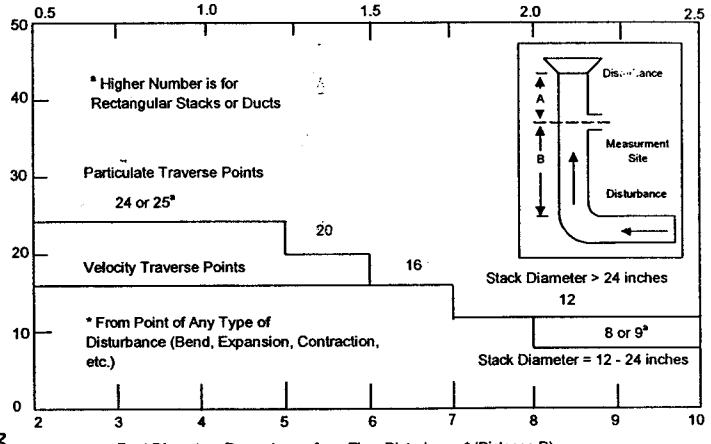
Flow Disturbances	
Upstream - A (ft)	4
Downstream - B (ft)	39
Upstream - A (duct diameters)	~~4.0~~ 4.07
Downstream - B (duct diameters)	~~3.91~~ 3.965

Diagram of Stack



Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	0.1	10"	28 ✓
2	0.3	30"	48 ✓
3	0.5	50"	68 ✓
4	0.7	70"	88 ✓
5	0.9	90"	108 ✓
6			
7			
8			
9			
10			
11			
12			



Equivalent Diameter = (2*L*W)/(L+W) 118.03

Traverse Point Location Percent of Stack -Circular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

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Determination of Stack Gas Velocity - Method 2

Client: SMEPA | Operator: JP/TB | Pitot Coeff (Cp): 0.84
Location/Plant: HATTIESBURG, MS | Date: 10/27/99 | Stack Area, ft² (As):
Source: #2 INLET | W.O. Number: | Pitot Tube/Thermo ID: P112

Run Number	PRELIM		
Time	1100 –		
Barometric Press, in Hg (Pb)	29.80		
Static Press, in H_2O (Pstatic)	~~-5~~ -16.5		
Source Moisture, % (BWS)			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? Y / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0	—	A	1	0,99	310				
0	—		2	1,20	316				
0	—		3	1,20	324				
-,02	<5		4	1,20	327				
			5	1,10	325				
,05	-10	B	1	1,20	330				
,02	<5		2	1,30	334				
			3	1,30	335				
,05	<5		4	1,25	334				
			5	1,20	330				
-,02	5	C	1	1,25	315				
			2	1,25	329				
-,02	<5		3	1,40	335				
			4	1,35	328				
-,04	5		5	1,3	328				
0	—	D	1	1,25	310				
			2	1,40	318				
-,02	<5		3	1,40	322				
-,02	<5		4	1,40	327				
-,02	<5		5	1,20	322				
0	—	E	1	1,30	310				
0	—		2	1,40	~~330~~				
-0,01	<5		3	1,40	324				
-0,02	<5		4	1,30	327				
0	—		5	1,20	329				
Avg Angle		Avg Delta P & Temp							
		avg $\sqrt{\text{DeltaP}}$							
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$$

$$Tsa = Ts + 460$$

$$Ps = Pb + (Pstatic/13.6)$$

$$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$$

$$Qs(act) = 60 * Vs * As$$

$$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$$

Comments _____

where:
MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual,
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

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FGD OUTLET

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Page 1 of 2

Client	SMEPA			Meter Box ID	WC 15		
W.O.#	11634.001.002			Meter Box Y	.9961	K Factor	1.66
Project ID	SMEPA			Meter Box Del H	2.0355		
Mode/Source ID	U2 FGD			Probe ID / Length	6'		
Samp. Loc. ID	OUT			Probe Material	Boro		
Run No.ID	1			Pitot / Thermocouple ID	P137		
Test Method ID	OHM			Pitot Coefficient	0.84		
Date ID	26OCT1999			Nozzle ID	Glass		
Source/Location	UNIT 2 FGD Outlet			Avg Nozzle Dia (in)	0.210		
Sample Date	10/27/99			Area of Stack (ft²)	220.35		
Baro. Press (in Hg)	29.74 Temp 29.74			Sample Time	120 min		
Operator	ASA			Total Traverse Pts	12		

Stack Conditions

	Assumed	Actual
% Moisture	12	
Impinger Vol (ml)		IP/64
Silica gel (g)		15.2
CO2, % by Vol		11.1
O2, % by Vol		7.6
Temperature (°F)		
Meter Temp (°F)		
Static Press (in H_2O)		-.47
Ambient Temp (°F)	85°	

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft³)	0.019		0.010
Leak Check @ (in Hg)	15		10"
Pitot good	yes / no	yes / no	yes / no
Orsat good	yes / no	yes / no	yes / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	85	87
Reference Temp	84.1	86.0
Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Temp Change Response	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1355			474.150									
A 1	5		.84	1.39	477.5	180	88	86	250	249	68	8		
	10		.80	1.33	480.5	181	88	86	247	246	63	8		
2 2	15		.80	1.33	483.6	181	90	87	248	246	61	8		
	20		.79	1.31	486.7	181	92	88	248	246	61	8		
3 3	25		.69	1.15	489.6	184	94	89	253	248	61	7		
	30	1428	.66	1.10	492.445	183	95	89	254	247	63	7		
							95	91			68	8		LK 0.008
				Total	18.295									10"
	0	1435	—	—	492.514	—	—	—	—	—	—	—	—	
B 1	5		.74	1.23	495.5	178	95	91	250	247	68	8		
	10		.77	1.28	498.5	181	97	91	250	247	61	8		
2 2	15		.79	1.31	501.7	181	97	91	250	247	60	8		
	20		.71	1.18	504.6	181	99	92	255	247	56	7		
3	25		.56	.93	507.2	179	99	93	253	244	56	6		
	30	1506	.58	.96	509.928	180	99	93	253	247	57	6		
														LK 0.008
				Total	17.414									10"
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm 95		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H	Comments:		See Pg. 2							

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Filter # W 207

Ontario Hydro Method

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Client: SMEPA | Operator: REP.
Source: UNIT 2 FGD | Run No.: 1 1
Sample Loc.: Outlet | Date: 10/27/99 | K Factor: 1.66

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1510			510.017									
C 1	5		.86	1.43	513.3	178	98	94	245	246	61	8		
	10		.84	1.39	516.5	184	99	94	251	242	57	8		
2	15		.85	1.41	519.6	184	101	96	255	246	57	8		
	20		.86	1.43	522.8	184	101	95	252	247	55	8		
3	25		.70	1.16	525.7	183	101	95	249	246	55	7		
	30	1540	.70	1.16	528.627	183	101	95	254	246	57	7		
														LIT 0.008
				Total	18.610									@ 10"
	0	1547	—	—	528.640	—	—	—	—	—	—	—		
D 1	5		.86	1.43	531.9	184	100	97	246	238	62	8		
	10		.86	1.43	535.1	184	100	97	252	242	60	8		
2	15		.83	1.38	538.4	186	101	97	252	240	57	8		
	20		.83	1.38	541.4	185	101	96	248	242	58	8		
3	25		.67	1.11	544.3	185	102	96	247	245	59	7		
	30	1617	.69	1.15	547.243	185	102	97	250	245	63	7		
				Total	18.603									
												Final leak		0.010
													CK	@ 10"
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			0.8712	1.2650	72.922	182	95		245/255	238/247	68	8		
				Avg Sqrt Del H	Comments:									
				1.1227										

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RE

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

			Assumed	Actual
Client	SMEPA	Stack Conditions		
W.O.#	11634.001.002			
Project ID	SMEPA	% Moisture	12	
Mode/Source ID	U2 FGD	Impinger Vol (ml)		138.2
Samp. Loc. ID	OUT	Silica gel (g)		13.4
Run No.ID	2	CO2, % by Vol		11.1
Test Method ID	OHM	O2, % by Vol		7.2
Date ID	26OCT1999	Temperature (°F)		
Source/Location	UNIT 2 FGD Outlet	Meter Temp (°F)		
Sample Date	10/28/99	Static Press (in H_2O)		-.48
Baro. Press (in Hg)	29.80			
Operator	PEW	Ambient Temp (°F)		75

Meter Box ID	W15		
Meter Box Y	.9961		
Meter Box Del H	2.0355	Leak Checks	Initial / Mid-Point / Final
Probe ID / Length	6'	Sample Train (ft^3)	0.016 / / 0.014
Probe Material	Boro	Leak Check @ (in Hg)	15 / / 10
Pitot / Thermocouple ID	P137	Pitot good	yes / no / yes / no
Pitot Coefficient	0.84	Orsat good	yes / no / yes / no
Nozzle ID	G/965	Temp Check	Pre-Test Set / Post-Test Set
Avg Nozzle Dia (in)	0.210	Meter Box Temp	75 / 77
Area of Stack (ft^2)	220.35	Reference Temp	296.0 / 296.0
Sample Time	120 min	Pass/Fail (+/- 2°)	Pass / Fail / Pass / Fail
Total Traverse Pts	12	Temp Change Response	yes / no / yes / no

K Factor 1.66

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	903			548.000									
A 1	5		.89	1.48	551.3	188	79	79	250	249	62	8		
	10		.89	1.48	554.4	189	81	79	253	247	57	8		
2	15		.92	1.53	557.6	191	82	79	253	240	56	8		
	20		.92	1.53	560.9	191	86	80	249	245	56	8		
3	25		.72	1.20	563.8	190	87	80	250	248	56	6		
	30	933	.72	1.20	566.717	190	87	81	251	247	57	6		
														LK 0.010 @ 10"
				total	18.717									
	0	941	—	—	566.834	—	—	—	—	—	—	/		
B 1	5		.89	1.48	570.1	188	87	83	249	246	65	8		
	10		.90	1.49	573.2	189	88	83	248	248	60	8		
2	15		.88	1.46	576.5	189	90	83	248	246	56	8		
	20		.88	1.46	579.7	189	91	84	251	246	58	8		
3	25		.70	1.16	582.6	190	91	85	255	247	58	6		
	30	1011	.70	1.16	585.395	189	92	86	250	245	60	6		
														LK 0.008 @ 10"
				total	18.561									
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H	Comments:						Ontario Hydro Method			

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F:Hor # W208

ISOKINETIC FIELD DATA SHEET — Ontario Hydro Method - Mercury

Client: SMEPA | Operator: A.E.D.
Source: UNIT 2 FGD | Run No.: 2
Sample Loc.: Outlet | Date: 10/28/99 | K Factor: 1.66

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1017			585.500									
C1	5		.79	1.31	588.5	187	89	86	253	248	67	7		
	10		.79	1.31	591.6	188	91	86	250	245	64	7		
2	15		.68	1.13	594.4	189	92	87	249	244	61	6		
	20		.72	1.20	597.3	188	93	87	250	246	62	7		
3	25		.54	0.90	600.0	188	93	87	248	246	62	6		
	30	1047	.54	0.90	602.493	188	93	87	248	245	64	6		
														LK 0.012
				total	16.993									@10
	0	1053	—	—	602.610	—	—	—	—	—	—	—		
D1	5		.86	1.43	605.8	190	90	88	250	246	68	8		
	10		.86	1.43	609.0	190	93	89	253	248	66	8		
2	15		.87	1.44	612.1	192	94	88	251	245	62	8		
	20		.87	1.44	615.4	192	95	87	254	242	62	8		
3	25		.70	1.16	618.3	193	95	89	252	244	62	7		
	30	1124	.70	1.16	621.162	193	95	89	252	244	63	7		
														LK 0.014
				total	18.552									10"

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
0.8857	1.3109	72.823	190	87	248/255	242/249	68	8	

Avg Sqrt Del H: 1.1415

Comments:

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RS

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Page 1 of 2

Client	SMEPA			Meter Box ID	W15		
W.O.#	11634.001.002			Meter Box Y	0.9961		
Project ID	SMEPA			Meter Box Del H	2.0355		
Mode/Source ID	U2 FGD			Probe ID / Length	6		
Samp. Loc. ID	OUT			Probe Material	Boro		
Run No.ID	3			Pitot / Thermocouple ID	P137 W15		
Test Method ID	OHM			Pitot Coefficient	0.84		
Date ID	26OCT1999			Nozzle ID	Glass		
Source/Location	UNIT 2 FGD Outlet			Avg Nozzle Dia (in)	0.210		
Sample Date	10/28/99			Area of Stack (ft²)	220.35		
Baro. Press (in Hg)	29.80			Sample Time	120 min		
Operator	RED			Total Traverse Pts	12		

Stack Conditions

	Assumed	Actual
% Moisture	12	
Impinger Vol (ml)		195.2
Silica gel (g)		12.4
CO2, % by Vol		11.0
O2, % by Vol		7.2
Temperature (°F)		
Meter Temp (°F)		
Static Press (in H_2O)		-.48
Ambient Temp (°F)	80	

K Factor 1.66

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft³)	0.012		0.005
Leak Check @ (in Hg)	15		10
Pitot good	yes / no	yes / no	yes / no
Orsat good	yes / no	yes / no	yes / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	80	85
Reference Temp	82.7	86
Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Temp Change Response	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1236			621.506									
A 1	5		.80	1.33	624.6	189	88	87	244	248	68	6		
	10		.80	1.33	627.7	192	90	87	250	245	55	6		
2	15		.73	1.21	630.7	193	94	89	253	244	51	6		
	20		.79	1.31	633.9	193	94	88	251	241	52	6		
3	25		.66	1.10	636.6	193	96	90	253	251	53	6		
	30		.66	1.10	639.503	193	96	90	253	243	55	6		
				total	17.997									LK 0.008 10"
0	0	1317	—	—	639.600	—	—	—	—	—	—	—		
B 1	5		.70	1.16	642.5	186	94	91	244	245	67	6		
	10		.70	1.16	645.5	189	95	91	250	246	61	6		
2	15		.57	0.95	648.1	189	97	92	248	248	55	5		
	20		.60	1.00	650.9	189	97	92	255	245	55	5		
3	25		.54	0.90	653.5	189	98	93	248	247	54	5		
	30	1347	.54	0.90	656.115	188	98	93	251	246	54	5		
													LK	0.008
				Total	16.515									@ 10"
			Avg Sqrt Delta P	Avg Delta H	Total Volume 7	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H	Comments:									

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Filter # W209

Ontario Hydro Method

ISOKINETIC FIELD DATA SHEET — Ontario Hydro Method - Mercury

Client: SMEPA | Operator: P.E.D.
Source: UNIT 2 FGD | Run No.: 3
Sample Loc.: Outlet | Date: 10/28/99 | K Factor: 1.66

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1353			656.212									
C 1	5		.79	1.31	659.3	185	96	94	245	244	64	7		
	10		.79	1.31	662.4	191	98	94	252	245	58	7		
2	15		.77	1.28	665.5	191	99	94	250	245	55	6		
	20		.77	1.28	668.6	190	100	94	251	245	56	6		
3	25		.60	1.00	671.3	191	101	96	250	246	58	5		
	30	1423	.58	0.96	674.048	189	101	95	246	245	59	5		
					✓									
				Total	17.836									LK 0.014 10"
	0	1429	—	—	674.122	—	—	—	—	—	—	—		
D 1	5		.80	1.33	677.2	192	98	95	247	245	64	7		
	10		.82	1.36	680.4	192	99	95	247	245	58	7		
2	15		.79	1.31	683.5	193	99	95	251	244	55	7		
	20		.79	1.31	686.6	193	99	95	248	242	56	7		
3	25		.64	1.06	689.5	193	99	95	248	244	58	6		
	30	1500	.67	1.11	692.383	193	100	96	245	246	59	6		
					✓									
				Total	18.261									LK 0.005 10"
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts		Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			0.8373	1.1696	70.609	191		95	244/255	241/253	68	7		
				Avg Sqrt Del H	Comments:									
				1.0791										

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RB

SAMPLE RECOVERY FIELD DATA

Method Ontario Hydro Method — Mercury

Client SMEPA W.O. # 11634.001.002

Location/Plant Morrow Plant Source & Location UNIT 2 OUTLET

Run No. 1 Sample Date 10/27/99 Recovery Date 10/27/99

Sample I.D. SMEPA-U2FGD-OUT-1-OHM-26OCT99 Analyst _____ Filter Number W207

	Impinger 1	2	3	4	5	6	7 ~~Imp. Total~~	TOTAL LIQ	SiZ Gel ~~Total~~
Contents									
Final	820.3	654.6	729.3	689.2	615.0	619.2	674.7		315.2
Initial	682.0	599.7	725.3	686.3	614.5	618.4	675.7		300
Gain	138.3	54.9	4.0	2.9	0.5	0.8	-1	~~201.3~~ 200.4	15.2 215.6

Impinger Color 1-4 clear Labeled? ✓

Silica Gel Condition 1/2 blue Sealed? ✓

Run No. 2 Sample Date 10/28/99 Recovery Date 10/28/99

Sample I.D. SMEPA-U2FGD-OUT-2-OHM-26OCT99 Analyst _____ Filter Number W208

	Impinger 1	2	3	4	5	6	7 ~~Imp. Total~~	Liq Total ~~LI~~	Sil gel ~~Total~~
Contents									
Final	835.2	626.9	731.8	688.5	611.4	624.5	674.6		313.4
Initial	678.1	602.2	728.5	685.1	611.3	624.9	676.8		300
Gain	157.1	24.7	3.3	3.4	.1	-.4	-2.2	~~188.2~~ 186	13.4 199.4

Impinger Color 1-4 clear Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Run No. 3 Sample Date 10/28/99 Recovery Date 10/28/99

Sample I.D. SMEPA-U2FGD-OUT-3-OHM-26OCT99 Analyst _____ Filter Number W-209

	Impinger 1	2	3	4	5	6	7 ~~Imp. Total~~	Total LI Q	SiZ Gel Total
Contents									
Final	758.9	725.6	697.5	622.3	701.4	710.6	672.3		312.4
Initial	600.3	699.7	693.4	618.0	700.2	709.4	672.4		300
Gain	158.6	25.9	4.1	4.3	1.2	1.2	-.1	195.2	12.4 207.6

Impinger Color 1-4 Clear Colorless Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Check COC for Sample IDs of Media Blanks

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V CLS

SAMPLE RECOVERY FIELD DATA

Method Ontario Hydro Method - Mercury

Client SMePA W.O. #

Location/Plant Morrow Plant Source & Location FGD outlet

Run No. BT outlet Sample Date 10/25/99 Recovery Date 10/25/99

Sample I.D. SMePA-1/2FGD-OUT-BT-OHM-26OCT99 Analyst Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final	747.2	708.9	739.4	670.8	613.5	696.1	650.3		300
Initial	747.2	708.9	739.4	670.8	613.4	696.2	650.3		300
Gain	0	0	0	0	0.1	-0.1	0	0	0

Impinger Color 1-4 Clear colorless Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. ___ Analyst ___ Filter Number ___

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color ___ Labeled? ___

Silica Gel Condition ___ Sealed? ___

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. ___ Analyst ___ Filter Number ___

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color ___ Labeled? ___

Silica Gel Condition ___ Sealed? ___

Check COC for Sample IDs of Media Blanks

WESTON

Source Gas Analysis Data Sheet - Method 3

Client SMEPA Analyst JS

Location/Plant HATTIESBURG, MS Date 10/27/99

Source #2 STACK ~~Analytical Method (circle one)~~ Oxsat

W.O. Number _____

Run Number 01 Leak Check Good? (circle one) Yes No

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		11.1	18.7	7.6	
2		11.1	18.7	7.6	
3		11.1	18.7	7.6	
	Average	11.1	18.7	7.6	

Run Number 02 Leak Check Good? (circle one) Yes No DATE! 10/28/99

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		11.1	18.3	7.2	
2		11.1	18.3	7.2	
3		11.1	18.3	7.2	
	Average	11.1	18.3	7.2	

Run Number 03 Leak Check Good? (circle one) Yes No DATE! 10/28/99

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		11.0	18.2	7.2	
2		11.0	18.2	7.2	
3		11.0	18.2	7.2	
	Average	11.0	18.2	7.2	

Acceptable differences for repeat analysis:

if CO_2 > 4% than +/- 0.3%

if CO_2 < or = 4% than +/- 0.2%

if O_2 > or = 15% than +/- 0.2%

if O_2 < 15% than +/- 0.3%

Ambient Check

Oxygen 20.9

Carbon Dioxide 0.0

Report all values to the nearest 0.1 percent

Comments _____

V LV

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Sample and Velocity Traverse Point Data Sheet - Method 1

Client SMEPA
Loaction/Plant HATTIESBURG, MS
Source #2 STACK

Operator JP
Date 10/27/99
W.O. Number

Duct Type ☒ Circular ☐ Rectangular Duct — Indicate appropriate type
Traverse Type ☐ Particulate Traverse ☐ Velocity Traverse

Distance from far wall to outside of port (in.) = C	214.25
Port Depth (in.) = D	13.25
Depth of Duct, diameter (in.) = C-D	201.0
Area of Duct (ft^2)	220.35
Total Traverse Points	12
Total Traverse Points per Port	3

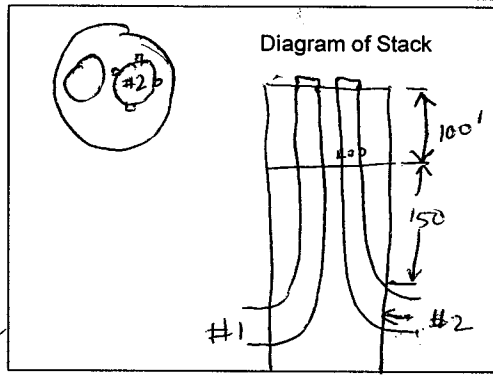
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

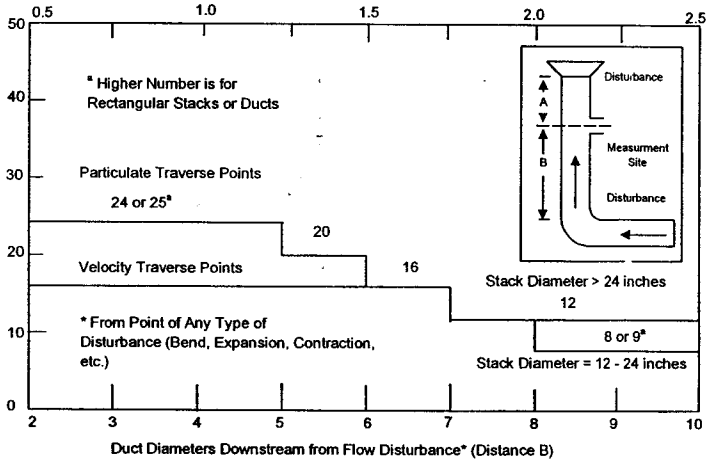
Flow Disturbances	
Upstream - A (ft)	100
Downstream - B (ft)	150
Upstream - A (duct diameters)	~6
Downstream - B (duct diameters)	~8.50

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	.044	8.8	22.1
2	.146	29.4	42.7
3	.296	59.5	72.75
4			
5			
6			
7			
8			
9			
10			
11			
12			

Diagram of Stack





Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

WESTON MANAGERS DESIGNERS/CONSULTANTS

Copyright Roy F Weston Inc Oct 1998PV

Determination of Stack Gas Velocity - Method 2

Client: Smelter Morrow Plant | Operator: CH | Pitot Coeff (Cp): .84
Location/Plant: Hattiesburg, MS | Date: 10/27/99 | Stack Area, ft² (As): 220.58
Source: Unit #2 | W.O. Number: 11634-001-002 | Pitot Tube/Thermo ID: P137

Run Number	Preliminary Flow		
Time	1320		
Barometric Press, in Hg (Pb)	29.62		
Static Press, in H_2O (Pstatic)	-.47		
Source Moisture, % (BWS)	.1200		
O_2, %	7.6		
CO_2, %	11.1		

Cyclonic Flow Determination		Traverse Location		Leak Check good? Y / N		Leak Check good? Y / N		Leak Check good? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0	0	1	1	.83	181				
0	<2		2	.81	181				
.02	<4		3	.80	182				
0	0	2	1	.80	184				
0	<2		2	.68	184				
0	0		3	.65	183				
0	0	3	1	.74	182				
0	<1		2	.75	181				
0	0		3	.56	180				
0	0	4	1	.79	181				
0	0		2	.80	183				
.02	<2		3	.58	182				
Avg Angle		Avg Delta P & Temp							
		avg $\sqrt{\text{DeltaP}}$							
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$$

$$Tsa = Ts + 460$$

$$Ps = Pb + (Pstatic/13.6)$$

$$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$$

$$Qs(act) = 60 * Vs * As$$

$$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$$

where:
MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual,
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Comments _____

WESTON MANAGERS DESIGNERS/CONSULTANTS

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APPENDIX D
LABORATORY ANALYTICAL REPORTS

COAL SAMPLE ANALYTICAL REPORT

PHILIP
ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

November 29, 1999

Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Laboratory Project: 187906
Client Reference: Southern Miss. Power Association
Coal Analysis

Dear Mr. O'Neill:

The samples which were logged in on 09-NOV-99 have been analyzed as requested. The analytical results are enclosed in the attached report.

Please note that any unused portion of the samples will be disposed after 18-DEC-99, unless you have requested otherwise.

Thank you for the opportunity to provide these services to you. If you have any questions concerning this report, please contact a Client Services representative at 610/921-8833.

Sincerely,

Fred Usbeck, CIH
Director, Laboratory Services

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

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

ANALYTICAL REPORT

Client: Roy F. Weston, Inc.

Report to: Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Project: 187906
Received: 08-NOV-99
Reported: 29-NOV-99

PURCHASE ORDER: 0008273

Project Description: Southern Miss. Power Association
Coal Analysis

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
SMEPA-Coal-Run 1						
Lab Sample: 1382251						
sampled: 27-OCT-99						
Moisture, Total	1.41		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.09	0.09	%	E776/300.0	16-NOV-99	DRK
SHORT PROX - COAL						
Ash	9.97	10.1	%	D 3174	16-NOV-99	VJO
Sulfur	1.09	1.11	%	D 4239	12-NOV-99	VJO
Heating Value	12960	13150	BTU/lb	D 3286	18-NOV-99	VJO
SMEPA-Coal-Run 2						
Lab Sample: 1382252						
sampled: 28-OCT-99						
Moisture, Total	1.71		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.09	0.09	%	E776/300.0	16-NOV-99	DRK
SHORT PROX - COAL						
Ash	10.8	11.0	%	D 3174	16-NOV-99	VJO
Sulfur	1.09	1.11	%	D 4239	16-NOV-99	VJO
Heating Value	12760	12980	BTU/lb	D 3286	18-NOV-99	VJO
SMEPA-Coal-Run 3						
Lab Sample: 1382253						
sampled: 28-OCT-99						
Moisture, Total	1.83		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.07	0.07	%	E776/300.0	16-NOV-99	DRK

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

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187906

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
SMEPA-Coal-Run 3						
Lab Sample: 1382253 - continued						
SHORT PROX - COAL						
Ash	11.4	11.6	%	D 3174	16-NOV-99	VJO
Sulfur	1.03	1.05	%	D 4239	12-NOV-99	VJO
Heating Value	12640	12880	BTU/lb	D 3286	18-NOV-99	VJO

< Indicates less than the limit of quantitation.

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

Philip Analytical Services
Quality Assurance Protocol

PAS Sample #: 1382251-1382252-1382253

Client Name: Roy F. Weston

PAS Project #: 187906

Job ID :

Units: BTU/lb,%

O1 SUMMARY FORM

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

Sample # & Parameter	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Matrix Spike Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD	Spikes Conc.	Found Conc.	Recovery		
1382253-Ash					11.5	11.5	0	11.8	12.0	102		0.01
1382251-Sulfur					1.09	1.10	0.9	1.78	1.80	101		0.01
1382253-Heating Value					12766	12761	0.1	13350	13366	100		50
1382253-Chlorine					0.07	0.08	13	2.00	2.03	102	0.01	0.01

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

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page

Refrigerator #

#/Type Container

Volume

Preservatives

ANALYSES REQUESTED

ORGANIC: VOA, BNA, Pest/PCB, Herb

INORG: Metal, CN

Date Rec'd

Date Due

Account #

WESTON Analytics Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Hot	BTU	Sulfur	ASH	Mercury	Chlorine
	[redacted]											

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

ASTM-D3286 for BTU

ASTM-D4239 for Sulfur

ASTM-D3174 for ASH

ASTM D2013/EPA7471 for Mercury

ASTM-E776/EPA 300 for Chlorine

DATE/REVISIONS:

1.

2.

3.

4.

5.

6.

WESTON Analytics Use Only

Samples were: 1) Shipped ___ or Hand Delivered ✓ Airbill#

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec'd (Y) or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	[signature]	10/29/99	10:40	[signature]	[signature]	10/29/99	1:45
[signature]	T. [signature]	11/4/99	10:40	[signature]	D. [signature]	11/8/99	11:00

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

RFW 21-21-001/A-7/91 T. [signature] L372 L373 L375 L377 L378 Ref# Cooler#

[signature] 11/8/99 14:30

^ 11/23/99 + page 1

weston

PN 187906

138225

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	0.35	0.35 > 1.41	****
MOISTURE:	%	1.06	1.06	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	88.63	89.89
ASH:	%	10.00	9.97	10.11
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	13010	12960	13150
SULFUR:	%	1.09	1.09	1.10
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.12	-0.12
HYDROGEN INCL WATER:	%	0.00	0.04	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.09	0.09	0.09
OXYGEN EXCL WATER:	%	****	87.57	88.82
OXYGEN INCL WATER:	%	88.82	88.82	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

^ 11/23/99 + page 1

weston
PN 187906
1382252

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	0.64	0.64 > 1.71	****
MOISTURE:	%	1.08	1.07	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	87.46	88.98
ASH:	%	10.90	10.83	11.02
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	12844	12760	12980
SULFUR:	%	1.10	1.09	1.11
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.12	-0.12
HYDROGEN INCL WATER:	%	0.00	0.07	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.09	0.09	0.09
OXYGEN EXCL WATER:	%	****	86.39	87.90
OXYGEN INCL WATER:	%	87.91	87.92	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

^ 11/23/99 + page 1

Weston
187904
1382253

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	0.78	0.78 > 1.83	****
MOISTURE:	%	1.06	1.05	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	86.76	88.38
ASH:	%	11.50	11.41	11.62
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	12742	12640	12880
SULFUR:	%	1.04	1.03	1.05
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.12	-0.12
HYDROGEN INCL WATER:	%	0.00	0.09	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.07	0.07	0.07
OXYGEN EXCL WATER:	%	****	85.77	87.37
OXYGEN INCL WATER:	%	87.39	87.40	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

```
                    13:56 11/12/99
ID CODE A00000099 WT0.252 CAL#2
                SULFUR      1.80%
                    14:00 11/12/99
ID CODE A01381976 WT0.259 CAL#2
Kirkely         SULFUR      2.10%
187866              14:08 11/12/99
ID CODE A01382326 WT0.262 CAL#2
Uestor  187928  SULFUR      3.02%
                    14:15 11/12/99
ID CODE A01382326 WT0.303 CAL#2
                SULFUR      3.02%
                    14:19 11/12/99
ID CODE A01382327 WT0.302 CAL#2
        187928  SULFUR      3.04%
                    14:22 11/12/99
ID CODE A01382328 WT0.259 CAL#2
        187928  SULFUR      3.28%
                    14:25 11/12/99
ID CODE A01382251 WT0.257 CAL#2
        187904  SULFUR      1.09%
                    14:28 11/12/99
ID CODE A01382251 WT0.257 CAL#2
        187906  SULFUR      1.10%
                    14:32 11/12/99
ID CODE A01382252 WT0.262 CAL#2
        187904  SULFUR      1.04%
                    14:36 11/12/99
ID CODE A01382253 WT0.297 CAL#2
        187904  SULFUR      1.04%
                    14:40 11/12/99
ID CODE A01381343 WT0.181 CAL#2
        ERM     SULFUR      [illegible]
        187681  14:45 11/12/99
ID CODE A01381344 WT0.173 CAL#2
        187681  SULFUR      [illegible]
                    14:50 11/12/99
ID CODE A01381345 WT0.120 CAL#2
        187681  SULFUR      1.50%
SO3 = 1.50 x 2.5 = 3.75%    15:00 11/12/99
ID CODE A01382346 WT0.140 CAL#2
                SO3
SO3 = 2.11 x 2.5 = 5.28%    SULFUR      2.11%
                    15:05 11/12/99
ID CODE A01382306 WT0.136 CAL#1
```

AIR DRY MOISTURE LOSS

Date In	Weighed By	Pan #	Pan Wt. (g)	Original Pan & Sample Weight (g)	Original Sample Weight (g)	Date Out	Weighed By	F & S					
11/6/99	GD	I	360.8	658.2		11/8	GD	4					
		H	368.9	742.3				4					
		F	365.6	733.8				5					
		K	368.4	759.9				5					
		E	365.7	678.3				5					
		G	361.3	650.0				5					
		C	365.6	805.2				5					
		L	369.8	686.3				5					
		D	363.3	589.8				5					
		81	314.3	489.5									
11/8/99	GD	XL	429.7	677.4	247.7	11/9	GD	650.1	27.3	11.0	Kimberly	1381976	S/G
													S/G
11/10/99	GD	XL	429.7	656.9	227.2	11/11	GD	656.1	0.800	0.35	Weston	1382251	S/G
		1	426.0	737.9	311.9			735.9	2.0	0.64		2252	S/G
		2	429.1	709.7	280.6			707.5	2.2	6.78		2253	S/G
													S/G
11/10/99	GD	D	363.2	515.1	151.9	11/11	GD	507.0	8.1	5.33	Millenium	1382306	S/G
		L	369.7	521.8	152.1			513.5	8.3	5.46		2307	S/G
		C	365.6	543.8	178.2			534.2	9.6	5.39		2308	S/G
													S/G
11/10/99	GD	3	421.5	894.4	472.9	11/11	GD	859.5	34.9	7.38	Weston	1382326	S/G
		4	428.0	1019.5	591.5			970.8	48.7	8.23		2327	S/G
		5	461.7	935.0	473.3			893.5	41.5	8.77		2328	S/G

Maine
PN 187841

Moisture
#1381899

Sample #	Tare wt. of Dish (g)	Wet Wt. Sample + Dish (g)	Dry Wt. Sample + Dish	% Moisture
1381899	360.8	698.2	494.6	60.3
1381900	368.9	742.3	497.9	65.4
1381901	365.6	733.8	511.1	60.4
1381902	368.4	759.9	499.8	66.4
1381903	365.7	678.3	504.5	55.5
1381904	361.3	650	506	49.8
1381905	365.5	805.2	523.7	64.0
1381906	369.8	686.3	511.8	55.1
1381907	363.3	589.8	523.6	29.2
1381908	314.3	489.5	433.6	31.9

Date	Lab #	Client	BTU/lbs	BTU/lbs -Sulfur	BTU/~~lbs~~ Gal	Remarks	
11/15/99	1382650	PAS	12426			188003	GW
	~~2651~~						
11/16/99	1382651	PAS	12409			188003	
	2652	"	12128			"	
	2653	"	< 50			"	
	2655	"	< 50			"	
	2656	"	< 50			"	
	2657	"	< 50				
	2658	"	< 50				
	2659	"	< 50				
	2660	"	< 50				
	2661	"	< 50				
(Dup)	2662	"	< 50	Dup.	Electric went out last date		
	2663	"	< 50				
	2664	"	< 50				
	2665		< 50				
	2666		< 50				
	2667		12352				
	2668		12437				
	2669		14775	Dup 14706			
	2670		12406				
	2671		12411				
	2672		12438				
	2673		14542				
	2674		14588				
Dup.	2675		14493				
	2676		12447				
	2677		14820				
	2678		13263				
	2679		19063				
11/18/99	1382251	Weston	13035			187906	RHD
	1382252	"	12869			"	
	1382253	"	12766			"	
Dup	1382253	"	12761			"	
11-18-99	1382288	Katahbin	14021			187906	
	2305	Wheelabrator	19313			187915	
	2306	Millenium	08088		138,050	187920	
	2307	"	08317			187921	
	2308		08134			187921	
	2326	Weston	11695			187921	
	2327	"	12651			187928	
11-18-99	2328	"	12706			187928	
Dup	2328		12609			"	
						"	

D-11

Coal/RDF Proximate Analysis

DATE: 11/16/97 Signature: V. Otteo

CLIENT	Central	Kimberly	Weston					
Laboratory Number	98	1381976	1382326	1382327	1382328	1382328 (Dup)	1382951	1382952
all weights in grams								
% Air-dry Loss		1.10	7.38	8.23	8.77		0.35	0.64
Weight of Crucible and Sample	22.9239	19.4445	22.9196	18.7853	21.2582	20.0799	21.5220	18.1677
Weight of Crucible	21.7901	18.3101	21.9301	17.6890	20.2596	19.3883	20.5378	17.1619
Weight of Sample	1.1338	1.1344	.9895	1.0963	.9986	.6916	.9842	1.0058
Weight of Crucible and Sample	22.9239	19.4445	22.9196	18.7853	21.2582	20.0799	21.5220	18.1677
Weight after 105 deg. C	22.9180	19.4377	22.8917	18.7560	21.2323	20.0616	21.5116	18.1568
Weight loss (moisture)	.0059	.0068	.0279	.0293	.0259	.0183	.0104	.0169
% Residual Moisture	0.52	0.60	2.82	2.67	2.59	2.65	1.06	1.68
Weight of Crucible and Sample	21.1231	21.6399						
Weight of Crucible	20.5721	20.8082						
Weight of Sample	.5510	.8317						
Weight of Crucible and Sample	21.1231	21.6379						
Weight after 950 deg. C for 7 min.	20.9807	21.5796						
Weight loss (Volatiles)	.1424	.0603						
% Volatiles	25.84	7.25						
% Residual Moisture	.52	.68						
% Volatile Matter	25.3	6.65						
Weight after 750 deg. C	21.9254	18.7117	22.0561	17.7969	20.3538	19.4542	20.6365	17.2712
Weight of Crucible	21.7901	18.3101	21.9301	17.6890	20.2596	19.3883	20.5378	17.1619
Weight of Ash	.1355	.4016	.1260	.1079	.0942	.0659	.0987	.1093
% Ash	12.0	35.4	12.7	9.84	9.43	9.53	10.0	10.9
% Sulfur		2.18	3.02	3.04	3.28		1.09	1.10
BTU per pound		8893	11695	12651	12706		13035	12869
BTU sulfur correction		48	49	70	75		25	25
BTU per pound, corrected		8845	11634	12581	12631		13010	12844
BTU per pound, Moisture Ash Free								

Coal/RDF Proximate Analysis

DATE: 11/16/99

Signature: V. Boyd

CLIENT	Weston →		Millenium →		→	Kimberly		
Laboratory Number	1382253	1382253 (Dup)	1382306	1382307	1382308	1382908		
all weights in grams								
% Air-dry Loss	0.78		TM-5.33	TM-5.46	TM-5.39			
Weight of Crucible and Sample	21.2231	22.3759	19.4589	19.2672	21.4930			
Weight of Crucible	20.2334	21.3846	18.2946	17.8524	19.8622			
Weight of Sample	.9897	.9913	1.1643	1.4148	1.6308			
Weight of Crucible and Sample	~~21.2231~~	~~22.3759~~						
Weight after 105 deg. C	21.2126	22.3654						
Weight loss (moisture)	.0105	.0105						
% Residual Moisture	1.04	1.04						
Weight of Crucible and Sample						22.4527		
Weight of Crucible						21.4964		
Weight of Sample								
Weight of Crucible and Sample								
Weight after 950 deg. C for 7 min.						22.3807		
Weight loss (Volatiles)								
% Volatiles								
% Residual Moisture								
% Volatile Matter								
Weight after 750 deg. C	20.3477	21.4990	18.3074	17.8629	19.8726			
Weight of Crucible	20.2334	21.3846	18.2946	17.8524	19.8622			
Weight of Ash	.1143	.1144	.0128	.0105	.0104			
% Ash	11.5	11.5	1.10	0.74	0.64			
% Sulfur	1.04		0.03	0.02	0.01			
BTU per pound	12769		8088	8317	8134			
BTU sulfur correction	24							
BTU per pound, corrected	12745							
BTU per pound, Moisture Ash Free								

CHLORINE, BOMBING — TITRATION

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mv readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
11/13/89	winton 1382227 187928	50 / 0.5657	VO			11.8	mg/l x	50 / 0.5657	x .0001				
							=	0.10% Cl					
	1382228 187928	50 / 0.4244				9.92	mg/l	x 50 / 0.4244	x .0001				
							=	0.11% Cl					
	1382328 (Dup) 1	50 / 0.4423				10.24	mg/l	x 50 / 0.4423	x .0001				
							=	0.11% Cl					
	1382251 187904	50 / 0.4998			9.35		mg/l	x 50 / 0.4998	x .0001				
							=	0.09% Cl					
	1382252 187904	50 / 0.4486			8.51		mg/l	x 50 / 0.4486	x .0001				
							=	0.09% Cl					

CHLORINE; BOMBING — TITRATION

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mv readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
11/15/99	~~Water~~ 1382253 187906	50 / 0.4320	VO			6.07	mg/L × 50 / 0.4320 × .0001 = 0.07 % Cl						2620
	1382253 (Dup)	50 / 0.4423				7.61	mg/L × 50 / 0.4423 × .0001 =	0.08 % Cl					

D-15

0084

188022
188034
187962
187906-01
187928-01

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/18/99	Element: HG
Analyst: SMW	Time of Analysis: 11:04
Data Validated by: DK 11/18/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-28-23-25, 29-1-3	11/17/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-29-5	11/17/99
IPC/CCV	360-29-4	〃

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Susan M. Wiederhorn 11/18/99
Signature of Analyst and Date

Sample Preparation Log

Date / Time	Project #	Sample #	Prep Method	Initial Wt. / Vol.	Units	Final Volume	Units	Sample Type	Remarks (QA\QC)	Initials
11/17/99	188033	1382871	6010	1	tube	50	ml	centrifuge tube		SMW
↓	↓	2872	↓	↓	↓	↓	↓	↓		↓
11/17/99 1410	*	LRB#1 DW	245.1	100	ml	100	ml			SMW
		LFB#1 DW								
	188022	1382789						DW		
	↓	2789 Dup						↓		
		2789 MS								
		2789 MSD								
		LRB#2 WW								
		LFB#2 WW								
	188034	1382837						WW		
	↓	2838						↓		
		2838 Dup								
		2838 MS								
		2838 MSD	↓							
		LRB#3 TCLP	7470							
		LFB#3 TCLP		↓						
	187962	1382502		20				TCLP		
	↓	2503								
		2504								
		2504 Ext Dup								
		2504 MS						↓		
	↓	2504 MSD	↓	↓						
		LRB#4 soil	7471	100						
		LFB#4 soil		↓	↓					
	187906	1382251		0.23	g			CO		
	↓	2252		0.21				↓		
		2253		0.20						
	187928	2326		0.21						
	↓	2327		0.21						
↓	↓	2328	↓	0.20	↓	↓	↓	↓		↓

Comments : Samples prepped 11/17/99 1410 were placed in a 95°C waterbath at 15:30 and removed at 17:30. LFB's, MS, & MSD's were fortified w/ 200 uL working std solution.

D-17

Sample Preparation Log

Date / Time	Project #	Sample #	Prep Method	Initial Wt. / Vol.	Units	Final Volume	Units	Sample Type	Remarks (QA\QC)	Initi
11/17/99	187928	1382328 OW	7471	0.24	g	100	ml	CO		Sm
↓	↓	2328 ms	↓	0.21	↓	↓	↓	↓		↓
↓	↓	2328 msD	↓	0.21	↓	↓	↓	↓		↓
↓	*	0.20 ug/L CRDL	245.1	100	ml	↓	↓		20 ug Hg Stock Soln	↓

Comments :

D-18

Reagents, QC, Standards Preparation Log Hg_{360}

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents #	Vol/Wt of Reagents Units	Reagent SSM ID #	Conc.	Final Volume #	Final Volume Units	Dilution Matrix	Remarks
1) 11/10/99 1100	GMP		Cal Blk	—	—	—	—	100	mL		
2)			0.50 ug/L Hg Std	50	uL	360-27-24	1.00 mg/L Hg				
3)			1.00	100							
4)			2.00	200							
5)			5.00	500							
6)			10.0	1000							
7)			IPC/CCV 5.0 ug/L	500							
8)			QCS / ICV 5.0 ug/L	500		360-27-25					
9) 11/12/99 1150	GMP		1.00 mg/L Hg Stock Std.	100	uL	Hg-9951185019	1000 mg/L	100	mL	0.15% HNO_3	
10)			1.00 mg/L Hg QCS stock	100	uL	Hg-995123001					
11)			Cal Blk	—	—	—	—	50	mL	2.5mL HNO_3 + 2.5mL HCl	NIOSH 6009
12)			0.20 ug/L Hg std	10	uL	360-28-9	1.00 mg/L Hg				
13)			0.50	25							
14)			1.00	50							
15)			2.00	100							
16)			5.00	250							
17)			ICV/QCS 3.0 ug/L	150		360-28-10					
18)			IPC/CCV 2.0 ug/L	100		360-28-9					
19)			1.00 mg/L IPC-Hg Std.	500	uL	995137500 1	200 mg/L Hg	100	mL	0.15% HNO_3	
20)			2.00 ug/L IPC-Hg Std	200	uL	360-28-19	100 mg/L Hg	100	mL	5.0mL HNO_3 + 5.0mL HCl	
21) 11/17/99 1100	SMW		1.00 mg/L Hg Stock	100	uL	Hg-9951185019	1000 mg/L	~~50~~ 100	mL	0.15% HNO_3	
22)			1.00 mg/L Hg QCS Stock	↓	↓	Hg-995123001	↓	100	ml		
23)			Cal Blk	—	—	—	—	50	mL	2.5% HNO_3 T 2.5% HCl	NIOSH 6009
24)			0.20 ug/L Std	10	uL	360-28-21	1.00 mg/L	50	ml		
			[illegible]	25	↓	↓	↓	↓	↓	↓	↓

Reagents, QC, Standards Preparation Log # 360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents		Reagent SSM ID #		Final Volume		Dilution Matrix	Remarks
				#	Units		Conc.	#	Units		
1) 11/7/06	SMS		1.00 mg/L Std	50	ul	360-28-21	1.00 mg/L	50	ml	2.5% HNO3 + 2.5% HCl	NIOSH 6009
2)			2.00	100							
3)			5.00	250							
4)			ICP/CCV 2.0 mg/L	100							
5)			ICV/CCS 3.0 mg/L	150		360-28-22					
6)											
7)											
8)											
9)											
10)											
11)											
12)											
13)											
14)											
15)											
16)											
17)											
18)											
19)											
20)											
21)											
22)											
23)											
24)											
25)											

```
RunProt: ENVIRON
RunFold: 111899MG Seq: 0     Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:23:01 18 Nov 1999 Xmit: Off  Gas:          LPM
  Idle                                                User:             A/S: On
```

INSTRUMENT: Scheduled Maintenance

	Uses left	Last service	Next service
replace: Pump tubing	565	17-Nov-99	27-Nov-99
Waste drain tubing	2226	12-Nov-99	27-Oct-00
Liquid/gas separator	1447	07-Sep-99	11-Oct-00
pump head	10000	N/A	N/A
Hg lamp	N/A	30-Aug-99	27-Jan-00
Reductant bottle	228	15-Nov-99	13-May-00
process tubing	1447	N/A	N/A
Clean optical cell	600	N/A	N/A

* - needs maintenance

```
For help on <hotkey> press Shift <hotkey>
```

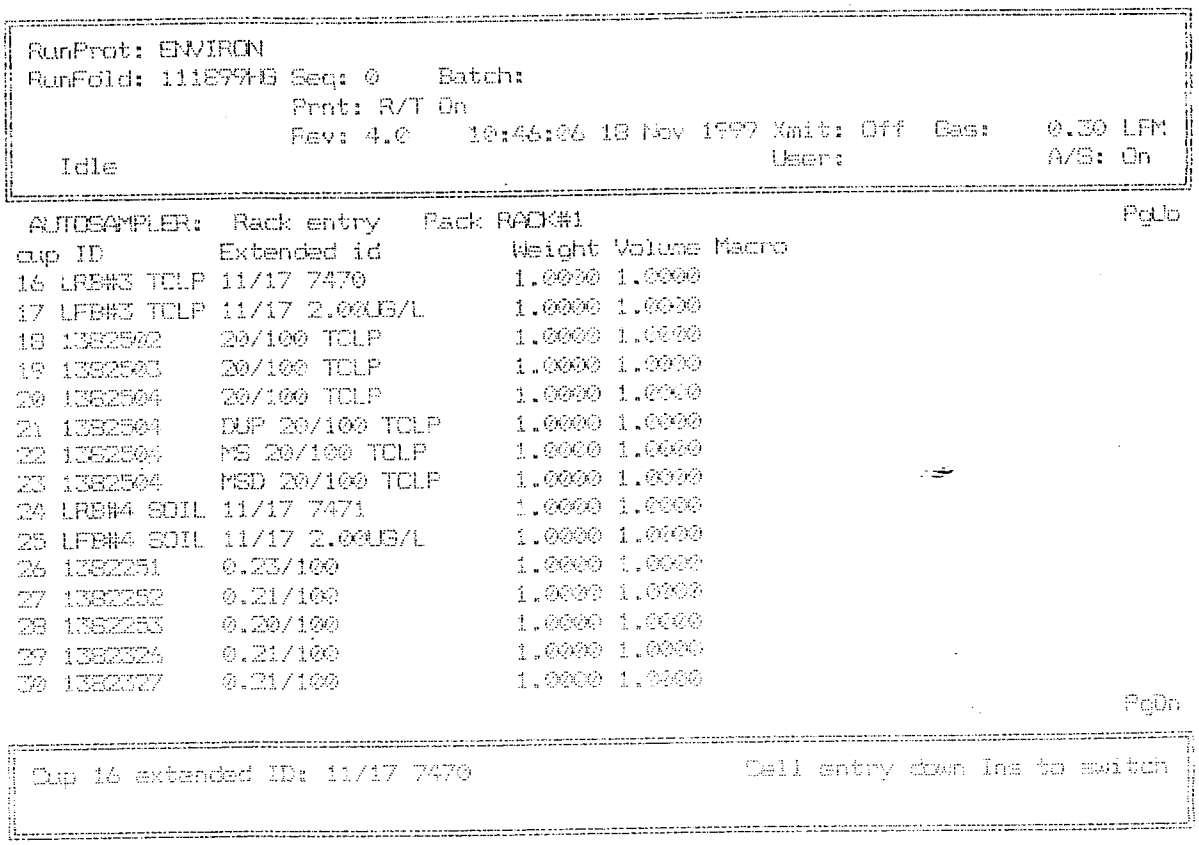
```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:43:30 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1

cup	ID	Extended id	Weight	Volume	Macro
1	DCS	11/17 5.00UG/L	1.0000	1.0000	
2	0.20 UG/L	REPORTING LIMIT	1.0000	1.0000	
3	LRB#1 DW	11/17 245.1	1.0000	1.0000	
4	LFB#1 DW	11/17 2.00UG/L	1.0000	1.0000	
5	1382789		1.0000	1.0000	
6	1382789	DUP	1.0000	1.0000	
7	1382789	MS 2.00UG/L	1.0000	1.0000	
8	1382789	MSD 2.00UG/L	1.0000	1.0000	
9	LRB#2 WW	11/17 245.1	1.0000	1.0000	
10	LFB#2 WW	11/17 2.00UG/L	1.0000	1.0000	
11	1382837		1.0000	1.0000	
12	1382838		1.0000	1.0000	
13	1382838	DUP	1.0000	1.0000	
14	1382838	MS 2.00UG/L	1.0000	1.0000	
15	1382838	MSD 2.00UG/L	1.0000	1.0000	

PgDn

```
Cup 7  ID: 1382789                                Call entry down Ins to switch
```


RunProt: ENVIRON
RunFold: 111879HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 10:46:06 10 Nov 1997 Xmit: Off Gas: 0.30 LPM
Idle
User: A/S: On
AUTOSAMPLER: Rack entry Rack RACK#1
PgUp
cup ID Extended id Weight Volume Macro
16 LRB#3 TCLP 11/17 7470 1.0000 1.0000
17 LFB#3 TCLP 11/17 2.00UG/L 1.0000 1.0000
18 1382502 20/100 TCLP 1.0000 1.0000
19 1382503 20/100 TCLP 1.0000 1.0000
20 1382504 20/100 TCLP 1.0000 1.0000
21 1382504 DUP 20/100 TCLP 1.0000 1.0000
22 1382504 MS 20/100 TCLP 1.0000 1.0000
23 1382504 MSD 20/100 TCLP 1.0000 1.0000
24 LRB#4 SOIL 11/17 7471 1.0000 1.0000
25 LFB#4 SOIL 11/17 2.00UG/L 1.0000 1.0000
26 1382251 0.23/100 1.0000 1.0000
27 1382252 0.21/100 1.0000 1.0000
28 1382253 0.20/100 1.0000 1.0000
29 1382326 0.21/100 1.0000 1.0000
30 1382327 0.21/100 1.0000 1.0000
PgDn
Dup 16 extended ID: 11/17 7470
Cell entry down Ins to switch

```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:47:06 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1 PgUp

cup	ID	Extended id	Weight	Volume	Macro
31	1382328	0.20/100	1.0000	1.0000	
32	1382328	DUP 0.24/100	1.0000	1.0000	
33	1382328	MS 0.2[illegible]/100	1.0000	1.0000	
34	1382328	MSD 0.21/100	1.0000	1.0000	
35			1.0000	1.0000	
36			1.0000	1.0000	
37			1.0000	1.0000	
38			1.0000	1.0000	
39			1.0000	1.0000	
40			1.0000	1.0000	
41			1.0000	1.0000	
42			1.0000	1.0000	
43			1.0000	1.0000	
44			1.0000	1.0000	

PgDn

```
Cup 44 extended ID:                          Cell entry down Ins to switch
```

```
RunProt: ENVIRON
RunFold: 111999HB Seq: 0    Batch:
                 Prnt: R/T On
                 Rev: 4.0    10:48:34 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                            User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1    9
Aper test              Tip Y      0 1    1
Test optic             Tip Z     95 1    1
Tip home               Gas      326
Out port                                          aperture   -        7
In port                                                  -100 to 100
Run pcode
Cal A/S
```

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 344
```

```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:48:42 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1    8
Aper test              Tip Y      0 1    1
Test optic             Tip Z     95 1    1
Tip home               Gas      326
Out port                                        Smpl. intensity    1222180 ) ±10%
In port                                         Ref. intensity     1227751
Run pcode
Cal A/S
```

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 142
```

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Standard: 1 Rep: 1				Seq:	0	10:54:20	18 Nov	1999	MS
Hg	.000	ug/l	5670						
*** Standard: 1 Rep: 2				Seq:	1	10:56:10	18 Nov	1999	MS
Hg	.000	ug/l	6430						
*** Standard: 1 Rep: 1				Seq:	2	10:59:00	18 Nov	1999	MS
Hg	.000	ug/l	-874						
*** Standard: 1 Rep: 2				Seq:	3	11:01:00	18 Nov	1999	MS
Hg	.000	ug/l	-1239						
*** Standard: 1 Rep: 1				Seq:	4	11:04:46	18 Nov	1999	MS
Hg	.000	ug/l	2937						
*** Standard: 1 Rep: 2				Seq:	5	11:06:37	18 Nov	1999	MS
Hg	.000	ug/l	3783						
*** Standard: 2 Rep: 1				Seq:	6	11:08:27	18 Nov	1999	MS
Hg	.500	ug/l	35714						
*** Standard: 2 Rep: 2				Seq:	7	11:10:31	18 Nov	1999	MS
Hg	.500	ug/l	37423						
*** Standard: 3 Rep: 1				Seq:	8	11:12:35	18 Nov	1999	MS
Hg	1.00	ug/l	74630						
*** Standard: 3 Rep: 2				Seq:	9	11:14:42	18 Nov	1999	MS
Hg	1.00	ug/l	71945						
*** Standard: 4 Rep: 1				Seq:	10	11:16:54	18 Nov	1999	MS
Hg	2.00	ug/l	150240						
*** Standard: 4 Rep: 2				Seq:	11	11:19:07	18 Nov	1999	MS
Hg	2.00	ug/l	145129						

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 5 Rep: 1				Seq: 12		11:21:18 18 Nov 1999 HG		
Hg	5.00	ug/l	361776					
*** Standard: 5 Rep: 2				Seq: 13		11:23:43 18 Nov 1999 HG		
Hg	5.00	ug/l	368093					
*** Standard: 6 Rep: 1				Seq: 14		11:26:04 18 Nov 1999 HG		
Hg	10.0	ug/l	717957					
*** Standard: 6 Rep: 2				Seq: 15		11:28:35 18 Nov 1999 HG		
Hg	10.0	ug/l	721474					

RunProt: ENVIRON

RunFold: 111899HG Seq: 16 Batch:

Prnt: R/T On

Rev: 4.0 11:29:03 18 Nov 1999 Xmit: Off Gas: 0.30 LPM

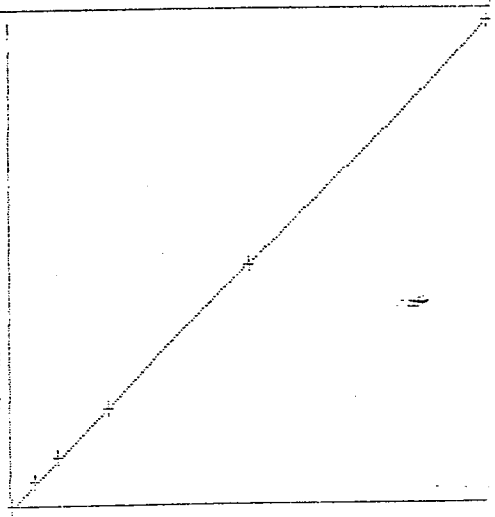
Idle User: A/S: On

CALIBRATION: Line proto: ENVIRON

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.006	-.006	Quadratic
S2	.500	.491	-.009	Utdlinear
S3	1.00	.968	-.032	
S4	2.00	2.03	.033	Accept
S5	5.00	5.03	.034	
S6	10.0	9.98	-.020	

A .0000000 r .999974

B 1.39401e-5 C -5.32999e-2



	Mean	%RSD		
S1	3360	17.8	2937	3783
S2	39878	1.29	38714	39426
S3	73287	2.59	74630	71945
S4	149688	0.53	150248	149128
S5	364934	1.22	361776	368093
S6	719715	0.35	717957	721474

New cal coefficients stored

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 16 11:31:37 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		104.	5.22	5.00	ug/l	.000

$\bar{x}$ = 0.00518 mg/L 104% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 17 11:33:59 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		103.	5.14	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 18 11:36:22 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-59900	-.060	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/L

*** Check Standard: 1 Ck1ICB/CCB Seq: 19 11:38:10 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.04i	.200	ug/l	.000

*** Sample ID: QCS Seq: 20 11:39:56 18 Nov 1999 HG

11/17 5.00UG/L

Hg	4.82	ug/l	.000	4.82

$\bar{x}$ = 0.00482 mg/L 96% R

*** Sample ID: QCS Seq: 21 11:42:13 18 Nov 1999 HG

11/17 5.00UG/L

Hg	4.82	ug/l	.000	4.82

*** Sample ID: 0.20 UG/L Seq: 22 11:44:31 18 Nov 1999 HG

REPORTING LIMIT

Hg	.146	ug/l	.000	.146

$\bar{x}$ = 0.00022 mg/L or 0.215 ug/L 105% R

*** Sample ID: 0.20 UG/L Seq: 23 11:46:26 18 Nov 1999 HG

REPORTING LIMIT

Hg	.284	ug/l	.000	.284

*** Sample ID: LRB#1 DW Seq: 24 11:48:16 18 Nov 1999 HG

11/17 245.1

Hg	-.064	ug/l	.000	-.064

$\bar{x}$ = <0.0002 mg/L

*** Sample ID: LRB#1 DW Seq: 25 11:50:00 18 Nov 1999 HG

11/17 245.1

Hg	-.058	ug/l	.000	-.058

*** Sample ID: LFB#1 DW Seq: 26 11:51:45 18 Nov 1999 HG

11/17 2.00UG/L

Hg	1.98	ug/l	.000	1.98

$\bar{x}$ = 0.00197 mg/L 99% R

*** Sample ID: LFB#1 DW Seq: 27 11:53:33 18 Nov 1999 HG

11/17 2.00UG/L

Hg	1.96	ug/l	.000	1.96

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382789				Seq: 29	11:56:07 18 Nov 1999 HG			
Hg	-.041	ug/l	.000	-.041				
*** Sample ID: 1382789				Seq: 29	11:57:51 18 Nov 1999 HG			
Hg	-.046	ug/l	.000	-.046				
*** Sample ID: 1382789				Seq: 30	11:59:35 18 Nov 1999 HG			
			DUP					
Hg	-.044	ug/l	.000	-.044				
*** Sample ID: 1382789				Seq: 31	12:01:20 18 Nov 1999 HG			
			DUP					
Hg	-.042	ug/l	.000	-.042				
*** Sample ID: 1382789				Seq: 32	12:03:05 18 Nov 1999 HG			
			MS 2.00UG/L					
Hg	2.14	ug/l	.000	2.14				
*** Sample ID: 1382789				Seq: 33	12:05:19 18 Nov 1999 HG			
			MS 2.00UG/L					
Hg	2.13	ug/l	.000	2.13				
*** Sample ID: 1382789				Seq: 34	12:07:36 18 Nov 1999 HG			
			MSD 2.00UG/L					
Hg	2.11	ug/l	.000	2.11				
*** Sample ID: 1382789				Seq: 35	12:09:45 18 Nov 1999 HG			
			MSD 2.00UG/L					
Hg	2.09	ug/l	.000	2.07				
*** Sample ID: LFBW2 WW				Seq: 36	12:11:54 18 Nov 1999 HG			
			11/17 245.1					
Hg	-.058	ug/l	.000	-.058				
*** Sample ID: LRBW2 WW				Seq: 37	12:13:40 18 Nov 1999 HG			
			11/17 245.1					
Hg	-.051	ug/l	.000	-.051				
*** Sample ID: LFBW2 WW				Seq: 38	12:15:24 18 Nov 1999 HG			
			11/17 2.00UG/L					
Hg	2.05	ug/l	.000	2.05				
*** Sample ID: LFBW2 WW				Seq: 39	12:17:41 18 Nov 1999 HG			
			11/17 2.00UG/L					
Hg	2.04	ug/l	.000	2.04				

$\bar{x} = <0.0002$ mg/L

$\bar{x} = <0.0002$ mg/L 0% RPD

$\bar{x} = 0.00214$ mg/L 107% R

$\bar{x} = 0.00210$ mg/L 105% R 2% RPD

$\bar{x} = <0.0002$ mg/L

$\bar{x} = 0.00205$ mg/L 102% R

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 40 12:19:51 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09	5.00	ug/l	.000

$\bar{x}$ = 0.00509 mg/l 102% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 41 12:22:14 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 42 12:24:38 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-54700	-.055	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 43 12:26:24 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.047	.200	ug/l	.000

*** Sample ID: 1382837 Seq: 44 12:28:10 18 Nov 1999 HG

Hg	.007	ug/l	.000	.007	

$\bar{x}$ = <0.0002 mg/l

*** Sample ID: 1382837 Seq: 45 12:29:56 18 Nov 1999 HG

Hg	-.001	ug/l	.000	-.001	

*** Sample ID: 1382838 Seq: 46 12:31:41 18 Nov 1999 HG

Hg	-.057	ug/l	.000	-.057	

$\bar{x}$ = <0.0002 mg/l

*** Sample ID: 1382839 Seq: 47 12:33:25 18 Nov 1999 HG

Hg	-.051	ug/l	.000	-.051	

*** Sample ID: 1382838 Seq: 48 12:35:10 18 Nov 1999 HG

				DUP	
Hg	-.051	ug/l	.000	-.051	

$\bar{x}$ = <0.0002 mg/l 0% RPD

*** Sample ID: 1382838 Seq: 49 12:36:54 18 Nov 1999 HG

				DUP	
Hg	-.049	ug/l	.000	-.049	

*** Sample ID: 1382838 Seq: 50 12:38:38 18 Nov 1999 HG

				MS 2.00UG/L	
Hg	2.04	ug/l	.000	2.04	

$\bar{x}$ = 0.00207 mg/l 104% R

*** Sample ID: 1382838 Seq: 51 12:40:47 18 Nov 1999 HG

				MS 2.00UG/L	
Hg	2.08	ug/l	.000	2.08	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382838				Seq: 52	12:42:54 18 Nov 1999 HG			
				MSD 2.00UG/L				
Hg	2.04	ug/l	.000	2.04				
*** Sample ID: 1382838				Seq: 53	12:45:04 18 Nov 1999 HG			
				MSD 2.00UG/L				
Hg	2.04	ug/l	.000	2.04				
*** Sample ID: LPB#3 TCLP				Seq: 54	12:47:19 18 Nov 1999 HG			
				11/17 7470				
Hg	-.064	ug/l	.000	-.064				
*** Sample ID: LRB#3 TCLP				Seq: 55	12:48:54 18 Nov 1999 HG			
				11/17 7470				
Hg	-.045	ug/l	.000	-.045				
*** Sample ID: LFB#3 TCLP				Seq: 56	12:50:40 18 Nov 1999 HG			
				11/17 2.00UG/L				
Hg	2.08	ug/l	.000	2.08				
*** Sample ID: LFB#3 TCLP				Seq: 57	12:52:51 18 Nov 1999 HG			
				11/17 2.00UG/L				
Hg	2.07	ug/l	.000	2.07				
*** Sample ID: 1382502				Seq: 58	12:55:05 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.037	ug/l	.000	-.037				
*** Sample ID: 1382502				Seq: 59	12:56:50 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.034	ug/l	.000	-.034				
*** Sample ID: 1382503				Seq: 60	12:58:34 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.032	ug/l	.000	-.032				
*** Sample ID: 1382503				Seq: 61	13:00:20 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.044	ug/l	.000	-.044				
*** Sample ID: 1382504				Seq: 62	13:02:04 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.031	ug/l	.000	-.031				
*** Sample ID: 1382504				Seq: 63	13:03:49 18 Nov 1999 HG			
				20/100 TCLP				
Hg	-.035	ug/l	.000	-.035				

$\bar{x}$ = 0.00204 mg/L 102%R

22 RPD

$\bar{x}$ = <0.0002 mg/L

$\bar{x}$ = 0.00208 mg/L 104%R

$\bar{x}$ = <0.0002 mg/L (100/20) = <0.001 mg/L

$\bar{x}$ = <0.001 mg/L

$\bar{x}$ = <0.001 mg/L

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 64 13:05:35 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.10	5.00	ug/l	.000

$\bar{x}$ = 0.00509 mg/l 102% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 65 13:07:55 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.07	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 66 13:10:16 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-62500	-.061	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 67 13:12:02 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.044	.200	ug/l	.000

*** Sample ID: 1382504 Seq: 68 13:13:48 18 Nov 1999 HG

DUP 20/100 TCLP

Hg	.095	ug/l	.000	.098	

$\bar{x}$ = <0.001 mg/l 0% RPD

*** Sample ID: 1382504 Seq: 69 13:15:34 18 Nov 1999 HG

DUP 20/100 TCLP

Hg	.090	ug/l	.000	.090	

*** Sample ID: 1382504 Seq: 70 13:17:22 18 Nov 1999 HG

MS 20/100 TCLP

Hg	2.59	ug/l	.000	2.59	

T.V. = 0.002 mg/l (100/20) = 0.01 mg/l

$\bar{x}$ = 0.00256 mg/l 128% R

× (100/20) = 0.028 mg/l

*** Sample ID: 1382504 Seq: 71 13:19:31 18 Nov 1999 HG

MS 20/100 TCLP

Hg	2.52	ug/l	.000	2.52	

*** Sample ID: 1382504 Seq: 72 13:21:41 18 Nov 1999 HG

MSD 20/100 TCLP

Hg	2.17	ug/l	.000	2.17	

$\bar{x}$ = 0.00215 mg/l (100/20) = 0.0108 mg/l

*** Sample ID: 1382504 Seq: 73 13:23:56 18 Nov 1999 HG

MSD 20/100 TCLP

Hg	2.13	ug/l	.000	2.13	

108% R

17% RPD

*** Sample ID: LRBM4 SOIL Seq: 74 13:26:04 18 Nov 1999 HG

11/17 7471

Hg	-.034	ug/l	.000	-.034	

$\bar{x}$ = <0.0002 mg/l

*** Sample ID: LRBM4 SOIL Seq: 75 13:27:50 18 Nov 1999 HG

11/17 7471

Hg	-.024	ug/l	.000	-.024	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: LFB#4 SOIL				Seq: 76	13:29:35 18 Nov 1999 HG			
				11/17 2.00UG/L				
Hg	2.10	ug/l	.000	2.10				
*** Sample ID: LFB#4 SOIL				Seq: 77	13:31:44 18 Nov 1999 HG			
				11/17 2.00UG/L				
Hg	2.08	ug/l	.000	2.08				
*** Sample ID: 1382251				Seq: 78	13:33:54 18 Nov 1999 HG			
				0.23/100				
Hg	.215	ug/l	.000	.215				
*** Sample ID: 1382251				Seq: 79	13:35:50 18 Nov 1999 HG			
				0.23/100				
Hg	.225	ug/l	.000	.225				
*** Sample ID: 1382252				Seq: 80	13:37:47 18 Nov 1999 HG			
				0.21/100				
Hg	.145	ug/l	.000	.145				
*** Sample ID: 1382252				Seq: 81	13:39:37 18 Nov 1999 HG			
				0.21/100				
Hg	.138	ug/l	.000	.138				
*** Sample ID: 1382253				Seq: 82	13:41:27 18 Nov 1999 HG			
				0.20/100				
Hg	.161	ug/l	.000	.161				
*** Sample ID: 1382253				Seq: 83	13:43:19 18 Nov 1999 HG			
				0.20/100				
Hg	.156	ug/l	.000	.156				
*** Sample ID: 1382326				Seq: 84	13:45:09 18 Nov 1999 HG			
				0.21/100				
Hg	.169	ug/l	.000	.169				
*** Sample ID: 1382326				Seq: 85	13:47:00 18 Nov 1999 HG			
				0.21/100				
Hg	.163	ug/l	.000	.163				
*** Sample ID: 1382327				Seq: 86	13:48:51 18 Nov 1999 HG			
				0.21/100				
Hg	.109	ug/l	.000	.109				
*** Sample ID: 1382327				Seq: 87	13:50:43 18 Nov 1999 HG			
				0.21/100				
Hg	.111	ug/l	.000	.111				

$\bar{x} = 0.00209$ mg/L 105% R

$\bar{x} = 0.00022$ mg/L $(100/0.23) = <0.10$ mg/kg

$\bar{x} = <0.10$ mg/kg

$\bar{x} = <0.10$ mg/kg

$\bar{x} = <0.10$ mg/kg

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 88 13:52:31 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.31	5.00	ug/l	.000

$\bar{x}$ = 0.00522 mg/l 104% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 89 13:54:41 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.12	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 90 13:56:58 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-59500	-.059	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 91 13:58:44 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ug/l	.000

*** Sample ID: 13622328 Seq: 92 14:00:30 18 Nov 1999 HG

0.20/100

Hg	.138	ug/l	.000	.138

$\bar{x}$ = <0.10 mg/kg

*** Sample ID: 13622328 Seq: 93 14:02:19 18 Nov 1999 HG

0.20/100

Hg	.133	ug/l	.000	.133

*** Sample ID: 13622328 Seq: 94 14:04:07 18 Nov 1999 HG

DUP 0.24/100

Hg	.170	ug/l	.000	.170

$\bar{x}$ = <0.10 mg/kg 0% RPD

*** Sample ID: 13622328 Seq: 95 14:05:56 18 Nov 1999 HG

DUP 0.24/100

Hg	.166	ug/l	.000	.166

*** Sample ID: 13622328 Seq: 96 14:07:45 18 Nov 1999 HG

MS 0.21/100

Hg	2.07	ug/l	.000	2.07

T.V. = 0.002 mg/l (100/0.219) = 0.952 mg/kg

$\bar{x}$ = 0.00207 mg/l (100/0.21) = 0.986 mg/kg

104% R

*** Sample ID: 13622328 Seq: 97 14:09:53 18 Nov 1999 HG

MS 0.21/100

Hg	2.06	ug/l	.000	2.06

*** Sample ID: 13622328 Seq: 98 14:12:02 18 Nov 1999 HG

MSD 0.21/100

Hg	1.86	ug/l	.000	1.86

$\bar{x}$ = 0.00187 mg/l (100/0.219) = 0.890 mg/kg

*** Sample ID: 13622328 Seq: 99 14:14:04 18 Nov 1999 HG

93% R

MSD 0.21/100

Hg	1.88	ug/l	.000	1.88

Folder: 111699MB
14:16:08 18 Nov 1999 Protocol: ENVIRON

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 100 14:16:08 18 Nov 1999 MB

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.29	5.00	ug/l	.000

$\bar{x}$ = 0.00529 mg/l 106%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 101 14:18:17 18 Nov 1999 MB

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.28	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 102 14:20:27 18 Nov 1999 MB

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-63400	-.063	.000	ug/l	.000

$\bar{x}$ < 0.0002 mg/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 103 14:22:13 18 Nov 1999 MB

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.052	.200	ug/l	.000

187906

PHILIP ANALYTICAL SERVICES

Client: Roy F. Weston		Test(s): Chloride
Date: 11/16/99	Initials: DK	Reviewed By: CA

Standard 1 Concentration: _____ Reading: _____
Standard 2 Concentration: _____ Reading: _____
Standard 3 Concentration: _____ Reading: _____
Standard 4 Concentration: _____ Reading: _____
Spike 1 Spike Amount: _____ Recv'd _____ Recv'y: _____
Spike 2 Spike Amount: _____ Recv'd _____ Recv'y: _____

CL2 CONT 1:50 4.10 mg/L

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

Sample			Chloride mg/L						
1382951			9.35 ✓						
1382952			8.51 ✓						
1382953			6.07 ✓						
1382953	(DUP)		7.61 ✓						
1382953	MS		16.4						
1382953	MSD		16.6						

Comments For Report:

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

Analytical Method:	LLD
EPA 300.0	1.00 mg/L

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

Philip Analytical Services

Quality Assurance Protocol

PAS Sample #: 1382953

Client Name: Roy F. Weston

PAS Project #: 187906

Job ID:

Units: mg/L

O1 SUMMARY FORM

Sample Number & Parameter	Sample Conc.	Matrix Spike			Matrix Spike Duplicate			Method Blank	Laboratory Control Sample		
		Spiked Conc.	Matrix Spike Conc.	Matrix Spike % Recovery	Matrix Spike Duplicate Conc.	Matrix Spike Duplicate % Recovery	Precision RPD (%)		Spiked Conc.	Found Conc.	% Recovery
CHLORIDE	6.07	10.00	16.4	103	16.6	105	1	0.095	10.00	10.06	101

	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spiked Conc.	Matrix Conc.	Matrix % Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD (%)	Spiked Conc.	Found Conc.	% Recovery		
CHLORIDE	6.07	10.00	16.4	103	6.07	7.61	92	10.00	10.06	101	0.095	1.00

Criteria Limits

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

PeakNet AS3500DX - 11169901.AS3

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	WATER	ACIDSCAN	111699	1	1	
50	1	AUTOCAL1	ACIDSCAN	111699	1	1	
50	1	AUTOCAL2	ACIDSCAN	111699	1	1	
50	1	AUTOCAL3	ACIDSCAN	111699	1	1	
50	1	AUTOCAL4	ACIDSCAN	111699	1	1	
50	1	AUTOCLA5	ACIDSCAN	111699	1	1	
50	1	AUTOCAL6	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	QCS	ACIDSCAN	111699	1	1	
50	1	LCS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	1382343 1:20	ACIDSCAN	111699	1	1	
50	1	1381345 1:100	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:100	ACIDSCAN	111699	1	1	
50	1	1382343 1:50	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:1000	ACIDSCAN	111699	1	1	
50	1	1380014	ACIDSCAN	111699	1	1	
50	1	1380015	ACIDSCAN	111699	1	1	
50	1	1380015DUP	ACIDSCAN	111699	1	1	
50	1	1380015 MS	ACIDSCAN	111699	1	1	
50	1	1380015 MSD	ACIDSCAN	111699	1	1	
50	1	1380017	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382918 F	ACIDSCAN	111699	1	1	
50	1	1382918 B	ACIDSCAN	111699	1	1	
50	1	1382919 F	ACIDSCAN	111699	1	1	
50	1	1382919 B	ACIDSCAN	111699	1	1	
50	1	1382920 F	ACIDSCAN	111699	1	1	
50	1	1382920 B	ACIDSCAN	111699	1	1	
50	1	1382921 F	ACIDSCAN	111699	1	1	
50	1	1382921 B	ACIDSCAN	111699	1	1	
50	1	1382922 F	ACIDSCAN	111699	1	1	
50	1	1382922 F MS	ACIDSCAN	111699	1	1	
50	1	1382922 B	ACIDSCAN	111699	1	1	
50	1	1382922 B MS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382251	ACIDSCAN	111699	1	1	
50	1	1382252	ACIDSCAN	111699	1	1	
50	1	1382253	ACIDSCAN	111699	1	1	
50	1	1382253 DUP	ACIDSCAN	111699	1	1	
50	1	1382253 MS	ACIDSCAN	111699	1	1	
50	1	1382253 MSD	ACIDSCAN	111699	1	1	
50	1	1382326	ACIDSCAN	111699	1	1	
50	1	1382327	ACIDSCAN	111699	1	1	
50	1	1382328	ACIDSCAN	111699	1	1	
50	1	1382328 DUP	ACIDSCAN	111699	1	1	
50	1	1382328 MS	ACIDSCAN	111699	1	1	

.l	Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
	50	1	1381344	ACIDSCAN	111699	1	1	
	50	1	CONTROL 1:50	ACIDSCAN	111699	1	1	
	50	1	METH BLK	ACIDSCAN	111699	1	1	
	50	1	IPC	ACIDSCAN	111699	1	1	
	50	1	LCS	ACIDSCAN	111699	1	1	
	50	1	WATER	STOP	111699	1	1	

More Run Parameters

al s	Oven Ctl	Oven Set	Cool Ctl	Cool Set	Cycle Time	Flush Vol	Visc Factor	Prep Visc	Inj Type	Needle Height
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
8	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
9	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
8	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	[illegible]	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	[illegible]	18	Off	0	0.00	400	Normal	Normal	Push	2.0

Ion Chromatography
11/16/99

ERM PROJ # 187681 (WATER SOL EXT) CHLORIDE EPA 300.0

Roy F. Weston Proj # 187380 (SOIL) CHLORIDE EPA 300.0

George Boy Proj # 188058 (AIR) HF, HNO_3, N_2SO_4 NIOSH 7903

CHLORINE (BOMBS)

1382251
1382252
1382253
1382253 DUP
1382253 MS
1382253 MSD

1382326
1382327
1382328
1382328 DUP
1382328 MS
1382328 MSD

1381343
1381344

50	1	1382343 1:20	ACIDSCAN	111699	1	1	
50	1	1381345 1:100	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:100	ACIDSCAN	111699	1	1	
50	1	1380014	ACIDSCAN	111699	1	1	
50	1	1380015	ACIDSCAN	111699	1	1	
50	1	1380017	ACIDSCAN	111699	1	1	
50	1	1380017 DUP	ACIDSCAN	111699	1	1	
50	1	1380017 MS	ACIDSCAN	111699	1	1	
50	1	1380017 MSD	ACIDSCAN	111699	1	1	
50	1	1382377	ACIDSCAN	111699	1	1	
50	1	1382378	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382918 F	ACIDSCAN	111699	1	1	
50	1	1382918 B	ACIDSCAN	111699	1	1	
50	1	1382919 F	ACIDSCAN	111699	1	1	
50	1	1382919 B	ACIDSCAN	111699	1	1	
50	1	1382920 F	ACIDSCAN	111699	1	1	
50	1	1382920 B	ACIDSCAN	111699	1	1	
50	1	1382921 F	ACIDSCAN	111699	1	1	
50	1	1382921 B	ACIDSCAN	111699	1	1	
50	1	1382922 F	ACIDSCAN	111699	1	1	
50	1	1382922 F MS	ACIDSCAN	111699	1	1	
50	1	1382922 B	ACIDSCAN	111699	1	1	
50	1	1382922 B MS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382251	ACIDSCAN	111699	1	1	
50	1	1382252	ACIDSCAN	111699	1	1	
50	1	1382253	ACIDSCAN	111699	1	1	
50	1	1382253 DUP	ACIDSCAN	111699	1	1	
50	1	1382253 MS	ACIDSCAN	111699	1	1	
50	1	1382253 MSD	ACIDSCAN	111699	1	1	
50	1	1382326	ACIDSCAN	111699	1	1	
50	1	1382327	ACIDSCAN	111699	1	1	
50	1	1382328	ACIDSCAN	111699	1	1	
50	1	1382328 DUP	ACIDSCAN	111699	1	1	
50	1	1382328 MS	ACIDSCAN	111699	1	1	
50	1	1382328 MSD	ACIDSCAN	111699	1	1	
50	1	1381343	ACIDSCAN	111699	1	1	
50	1	1381344	ACIDSCAN	111699	1	1	
50	1	CONTROL 1:50	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	LCS	ACIDSCAN	111699	1	1	

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	WATER	STOP	111699	1	1	

More Run Parameters

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

01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
03	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
06	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
07	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
08	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
09	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
10	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
11	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
12	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
13	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
14	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
15	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
16	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
17	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
18	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
19	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
20	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
21	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
22	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
23	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
24	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
25	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
26	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
27	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
28	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
29	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
30	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
31	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
03	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
05	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
06	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

07	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
08	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
09	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
10	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
11	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
12	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
13	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
14	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
15	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
03	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

File :	C:\PEAKNET\DATA\11169001.DXD	Report Date:	11/16/99 12:29:46 PM
le Name:	WATER - C40	Collected :	11/16/99 12:17:38 PM
pt # :	1	Vial # :	C40
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 11:03:02 AM
em Name:	ANIONS	Detector :	CD20
mn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
	50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
0.00	FLUORIDE	0.000	0	0	0	0.00
3.05	CHLORIDE	0.199	1281	10014	1	1.67
0.00	NITRITE	0.000	0	0	0	0.00
0.00	BROMIDE	0.000	0	0	0	0.00
0.00	NITRATE	0.000	0	0	0	0.00
0.00	PHOSPHATE	0.000	0	0	0	0.00
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2340	31046		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.05	CHLORIDE	0.199	1281	10014	1	1.67
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2340	31046		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
IDE	2.10	0
TE	3.62	0
DE	4.57	0
TE	5.35	0
HATE	7.22	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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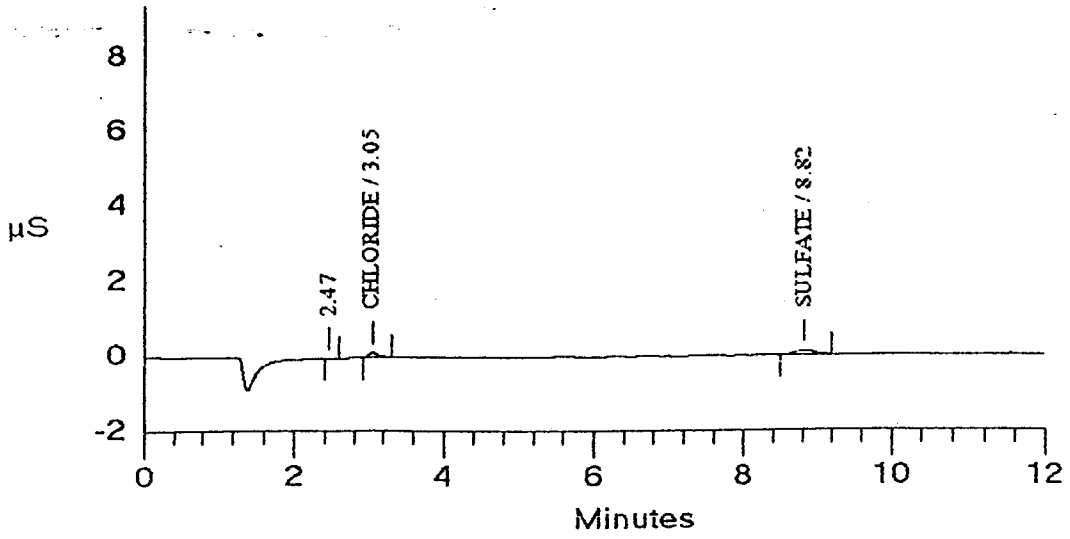
se 4.30 Page 1 of 2 11/16/99 12:29:46 PM

2.47		0.000	68	614	1	
3.05	CHLORIDE	0.199	1281	10014	1	1.67
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2408	31659		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.47		0.000	68	614	1	
	Totals	0.000	68	614		

File: 11169001.DXD Sample WATER - C40



ile: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/16/99 12:29:46 PM

********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169002.DXD	Report Date:	11/16/99 12:43:22 PM
e Name:	AUTOCAL1R - A01	Collected :	11/16/99 12:31:14 PM
t # :	2	Vial # :	A01
d File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 11:03:02 AM
m Name:	ANIONS	Detector :	CD20
Level :	1	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
RIDE	2.10	2.10	2.10	1.251e+005	1.214e+005	1.214e+005
TE	8.00	8.03	8.03	1.060e+005	1.077e+005	1.077e+005
	3.60	3.68	3.68	6.379e+004	6.356e+004	6.336e+004

OSPHATE	7.22	7.25	7.25	3.125e+004	2.097e+004	2.097e+004
LFATE	8.72	8.80	8.80	9.171e+004	8.010e+004	8.010e+004

File : C:\PEAKNET\DATA\11169002.DXD	Report Date:	11/16/99	12:43:22 PM
e Name: AUTOCAL1R - A01	Collected :	11/16/99	12:31:14 PM
t. # : 2	Vial # :	A01	
od File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99	12:43:22 PM
m Name: ANIONS	Detector :	CD20	
an Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
e Name: S/N 96020568 ID:24 0f 15	Moduleware :	1.17	

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
4.70	BROMIDE	1.000	3267	41387	1	2.92
5.57	NITRATE	1.000	3938	56497	1	4.05
7.25	PHOSPHATE	1.000	1178	20970	1	0.46
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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e 4.30 Page 1 of 2 11/16/99 12:43:22 PM

2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
4.70	BROMIDE	1.000	3267	41387	1	2.92
5.57	NITRATE	1.000	3938	56497	1	4.05
7.25	PHOSPHATE	1.000	1178	20970	1	0.46
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Peak Report: All Peaks **********

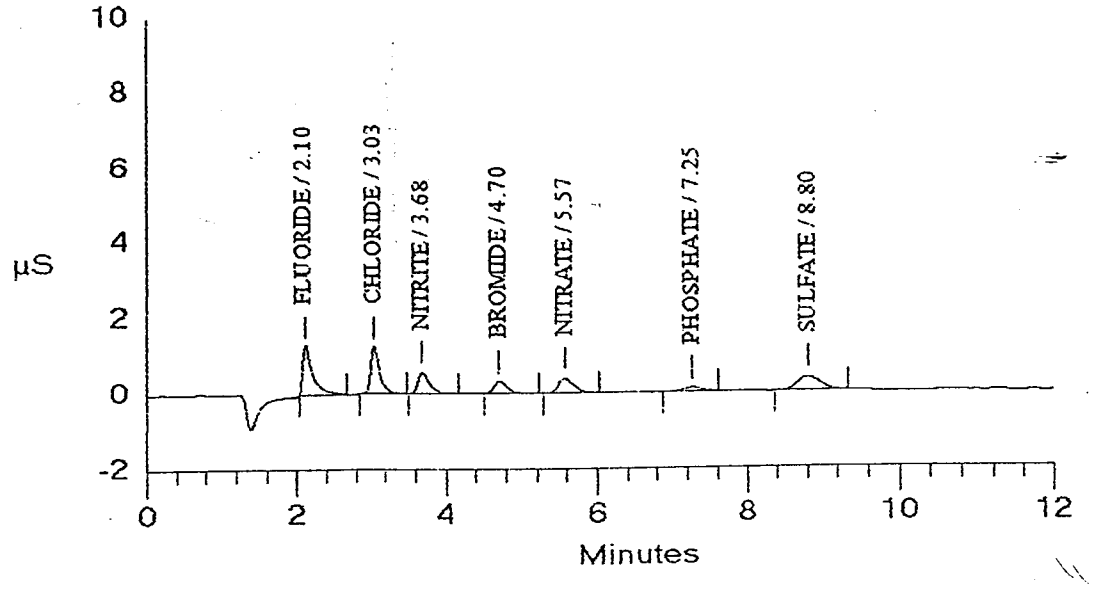
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
	BROMIDE	1.000	3267	41387	1	2.92

7.25	PHOSPHATE	1.000	1178	20570	1	0.40
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169002.DXD Sample AUTOCAL1R - A01



ule: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/16/99 12:43:22 PM

********** AUTOMATIC CALIBRATION UPDATE **********

File : C:\PEAKNET\DATA\11169003.DXD
le Name: AUTOCAL2R - A02
ct # : 3
od File: c:\peaknet\method\acidscan.met
em Name: ANIONS
Level : 2

Report Date: 11/16/99 12:56:59 PM
Collected : 11/16/99 12:44:51 PM
Vial # : A02
Last Update: 11/16/99 12:43:22 PM
Detector : CD20
Analyst :

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]	2.10	2.10	2.10	2.517e+005	2.542e+005	2.542e+005
[illegible]	3.03	3.03	3.03	2.084e+005	2.119e+005	2.119e+005
[illegible]	3.68	3.67	3.67	1.300e+005	1.333e+005	1.333e+005
[illegible]	4.70	4.68	4.68	8.909e+004	9.174e+004	9.174e+004

JLFATE 8.80 8.78 8.78 1.659e+005 1.577e+005 1.577e+005

File :	C:\PEAKNET\DATA\11169003.DXD	Report Date:	11/16/99 12:56:59 PM
le Name:	AUTOCAL2R - A02	Collected :	11/16/99 12:44:51 PM
ot # :	3	Vial # :	A02
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 12:56:59 PM
em Name:	ANIONS	Detector :	CD20
mn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91738	2	-0.35
5.53	NITRATE	2.000	7965	117097	2	-0.60
7.27	PHOSPHATE	2.000	2812	53732	1	0.23
8.78	SULFATE	2.000	7271	157686	1	-0.19
	Totals	14.000	91281	1019601		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91738	2	-0.35
5.53	NITRATE	2.000	7965	117097	2	-0.60
7.27	PHOSPHATE	2.000	2812	53732	1	0.23
8.78	SULFATE	2.000	7271	157686	1	-0.19
	Totals	14.000	91281	1019601		

********** Peak Report: All Peaks **********

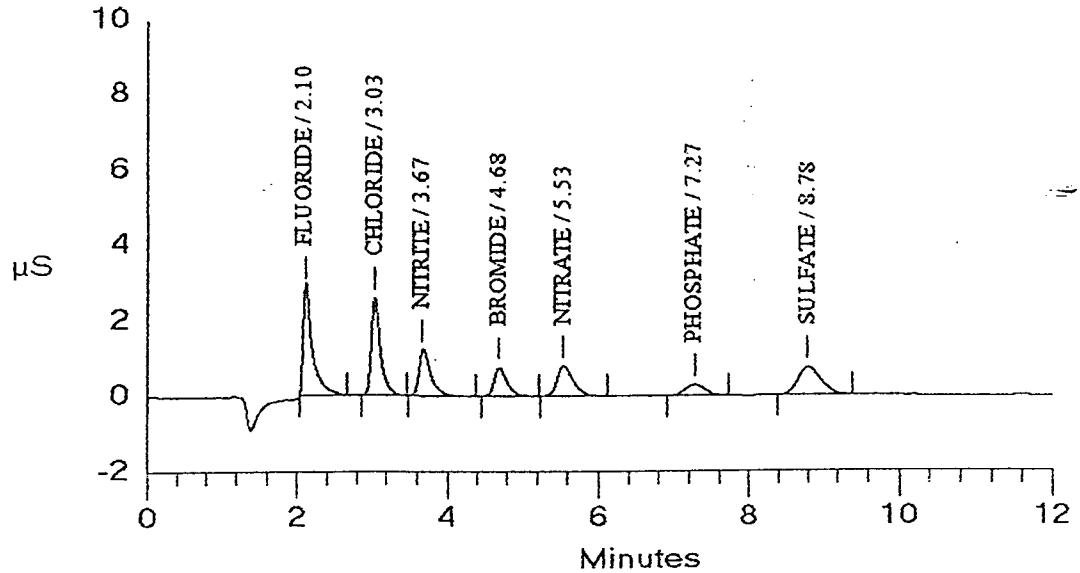
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91738	2	-0.35
[illegible]	NITRATE	2.000	7965	117097	2	-0.60

8.78	SULFATE	2.000	7271	[illegible]	1	0.15
	Totals	14.000	91281	1019601		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169003.DXD Sample AUTOCAL2R - A02



ile: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/16/99 12:56:59 PM

********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169004.DXD	Report Date:	11/16/99 1:10:35 PM
le Name:	AUTOCAL3R - A03	Collected :	11/16/99 12:58:28 PM
t # :	4	Vial # :	A03
od File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 12:56:59 PM
m Name:	ANIONS	Detector :	CD20
Level :	3	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]	2.10	2.10	2.10	7.292e+005	7.351e+005	7.351e+005
[illegible]	3.03	3.03	3.03	5.487e+005	5.564e+005	5.564e+005
[illegible]	3.67	3.67	3.67	3.363e+005	3.428e+005	3.428e+005
[illegible]	4.68	4.67	4.67	2.300e+005	2.328e+005	2.328e+005
[illegible]	5.53	5.50	5.50	2.960e+005	3.015e+005	3.015e+005

File :	C:\PEAKNET\DATA\11169004.DXD	Report Date:	11/16/99 1:10:35 PM
le Name:	AUTOCAL3R - A03	Collected :	11/16/99 12:58:28 PM
ct # :	4	Vial # :	A03
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:10:35 PM
em Name:	ANIONS	Detector :	CD20
on Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301468	1	-0.60
7.27	PHOSPHATE	5.000	7400	144517	1	0.00
8.78	SULFATE	5.000	18447	410429	1	0.00
	Totals	35.000	257970	2723509		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301468	1	-0.60
7.27	PHOSPHATE	5.000	7400	144517	1	0.00
8.78	SULFATE	5.000	18447	410429	1	0.00
	Totals	35.000	257970	2723509		

********** Peak Report: All Peaks **********

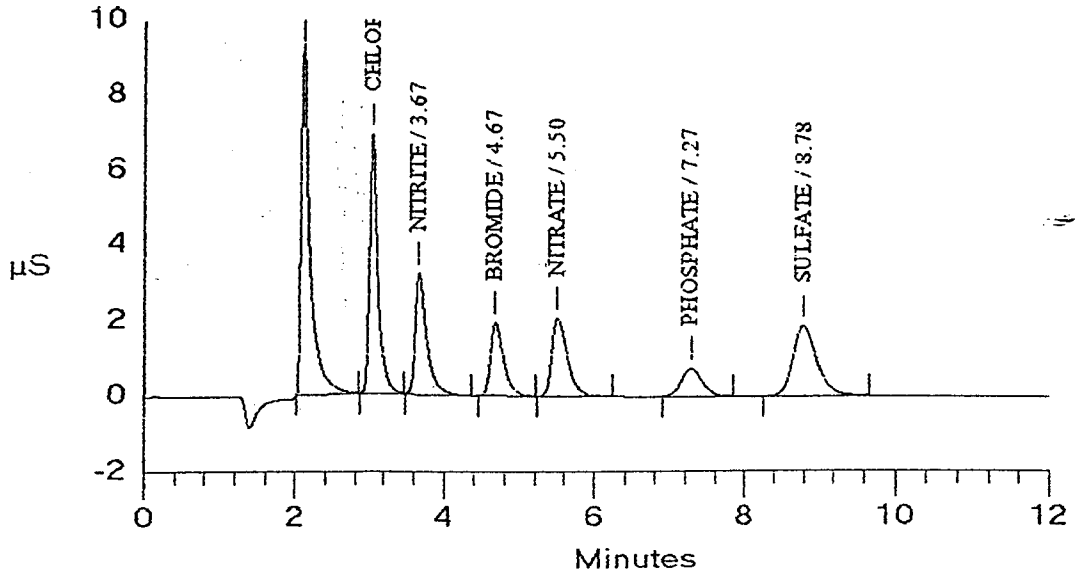
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301468	1	-0.60

Totals	35.000	257970	2723509

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		

File: 11169004.DXD Sample AUTOCAL3R - A03



********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169005.DXD	Report Date:	11/16/99 1:24:11 PM
le Name:	AUTOCAL4R - A04	Collected :	11/16/99 1:12:04 PM
ot # :	5	Vial # :	A04
od File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 1:10:35 PM
em Name:	ANIONS	Detector :	CD20
Level :	4	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
ORIDE	2.10	2.08	2.08	1.586e+006	1.593e+006	1.593e+006
LORIDE	3.03	3.00	3.00	1.179e+006	1.197e+006	1.197e+006
ITRITE	3.67	3.62	3.62	6.927e+005	7.044e+005	7.044e+005
OMIDE	4.67	4.62	4.62	4.749e+005	4.847e+005	4.847e+005
TRATE	5.50	5.42	5.42	6.165e+005	6.251e+005	6.251e+005
PHATE	7.27	7.22	7.22	2.958e+005	3.013e+005	3.013e+005

File :	C:\PEAKNET\DATA\11169005.DXD	Report Date:	11/16/99 1:24:11 PM
le Name:	AUTOCAL4R - A04	Collected :	11/16/99 1:12:04 PM
st # :	5	Vial # :	A04
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:24:11 PM
em Name:	ANIONS	Detector :	CD20
nn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76
	Totals	70.000	565244	5738034		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76
	Totals	70.000	565244	5738034		

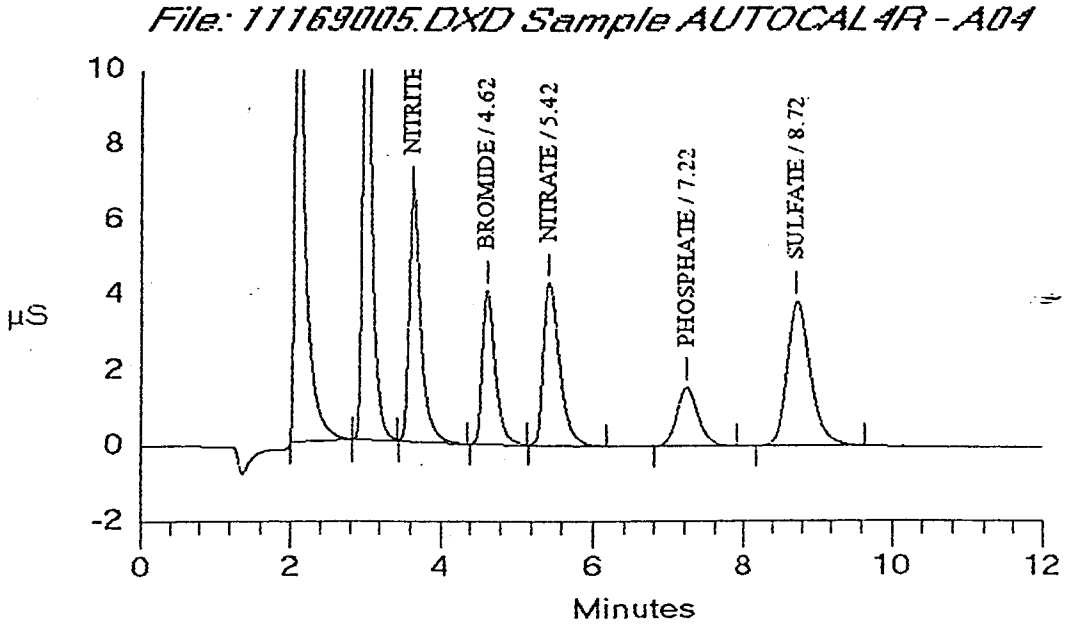
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76

Totals 70.000 365244 3738054

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		



ule: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/16/99 1:24:11 PM

File :	C:\PEAKNET\DATA\11169006.DXD	Report Date:	11/16/99 1:37:47 PM
le Name:	AUTOCLA5 - A05	Collected :	11/16/99 1:25:39 PM
ct # :	6	Vial # :	A05
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:24:11 PM
em Name:	ANIONS	Detector :	CD20
mn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

3.67	NITRITE	15.183	103314	1075226	2	1.38
4.65	BROMIDE	15.236	62877	738932	2	0.72
5.45	NITRATE	15.109	65154	943728	2	0.62
7.25	PHOSPHATE	15.172	23774	466157	1	0.46
8.77	SULFATE	14.982	58468	1254331	1	0.57
	Totals	106.286	875693	8873128		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	15.316	315690	2505123	1	1.60
3.05	CHLORIDE	15.287	246416	1889632	2	1.67
3.67	NITRITE	15.183	103314	1075226	2	1.38
4.65	BROMIDE	15.236	62877	738932	2	0.72
5.45	NITRATE	15.109	65154	943728	2	0.62
7.25	PHOSPHATE	15.172	23774	466157	1	0.46
8.77	SULFATE	14.982	58468	1254331	1	0.57
	Totals	106.286	875693	8873128		

********** Peak Report: All Peaks **********

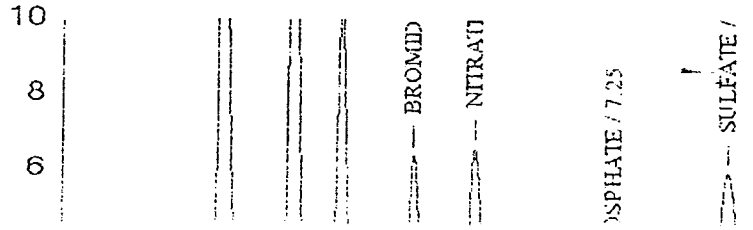
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	15.316	315690	2505123	1	1.60
3.05	CHLORIDE	15.287	246416	1889632	2	1.67
3.67	NITRITE	15.183	103314	1075226	2	1.38
4.65	BROMIDE	15.236	62877	738932	2	0.72
5.45	NITRATE	15.109	65154	943728	2	0.62
7.25	PHOSPHATE	15.172	23774	466157	1	0.46

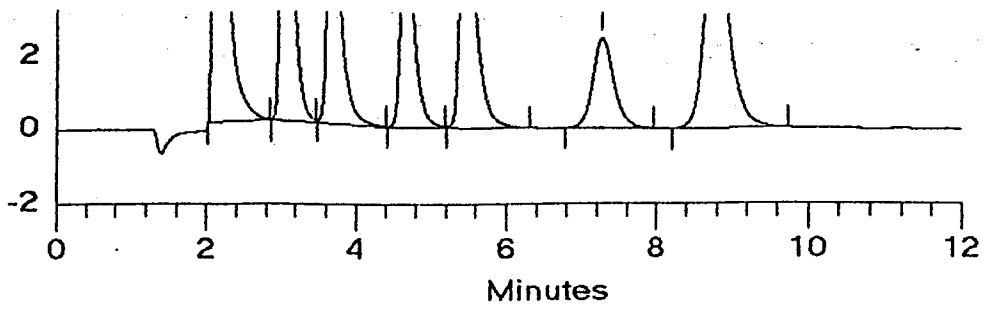
8.77	SULFATE	14.982	58468	1254331	1	0.57
	Totals	106.286	875693	8873128		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169006.DXD Sample AUTOCLAS -A05





********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169007.DXD	Report Date:	11/16/99 1:51:23 PM
le Name:	AUTOCAL6R - A06	Collected :	11/16/99 1:39:16 PM
ct # :	7	Vial # :	A06
od File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 1:24:11 PM
em Name:	ANIONS	Detector :	CD20
Level :	6	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
LUORIDE	2.08	2.08	2.08	3.376e+006	3.367e+006	3.367e+006
HLORIDE	3.00	3.00	3.00	2.583e+006	2.591e+006	2.591e+006
ITRITE	3.62	3.62	3.62	1.441e+006	1.447e+006	1.447e+006
ROMIDE	4.62	4.58	4.58	9.843e+005	9.900e+005	9.900e+005
ITRATE	5.42	5.37	5.37	1.277e+006	1.289e+006	1.289e+006
OSPHATE	7.22	7.20	7.20	6.279e+005	6.390e+005	6.390e+005
FATE	8.72	8.70	8.70	1.692e+006	1.692e+006	1.692e+006

ct # : 7		Vial #	: A06
od File: c:\peaknet\method\acidscan.met		Calibrated	: 11/16/99 1:51:23 PM
em Name: ANIONS		Detector	: CD20
nn Type:		Operator	: DK
Points: 3600		Rate	: 5.00 Hz
le Name: S/N 96020568	ID:24 Of 15	Moduleware	: 1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

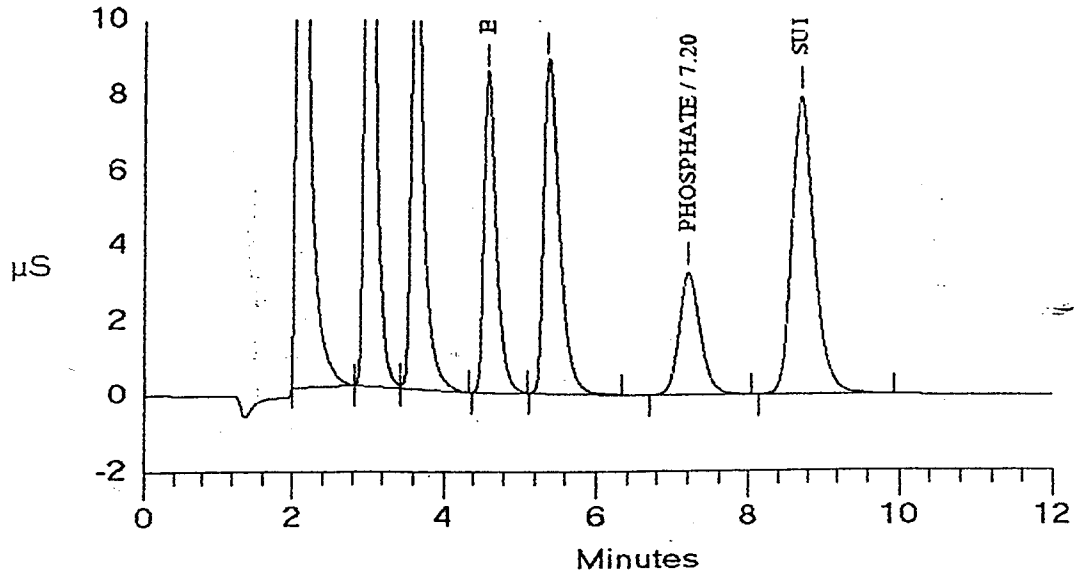
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169007.DXD Sample AUTOCAL6R - A06



Component: FLUORIDE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

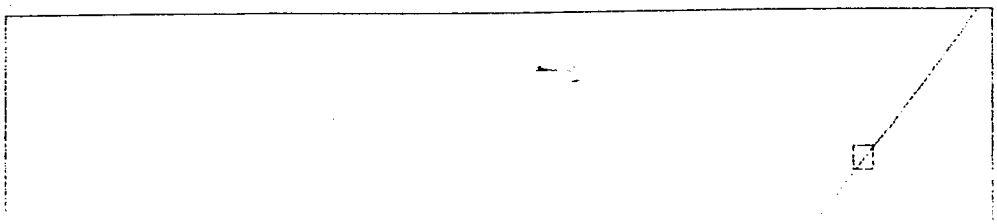
$r^2 = 0.999891$

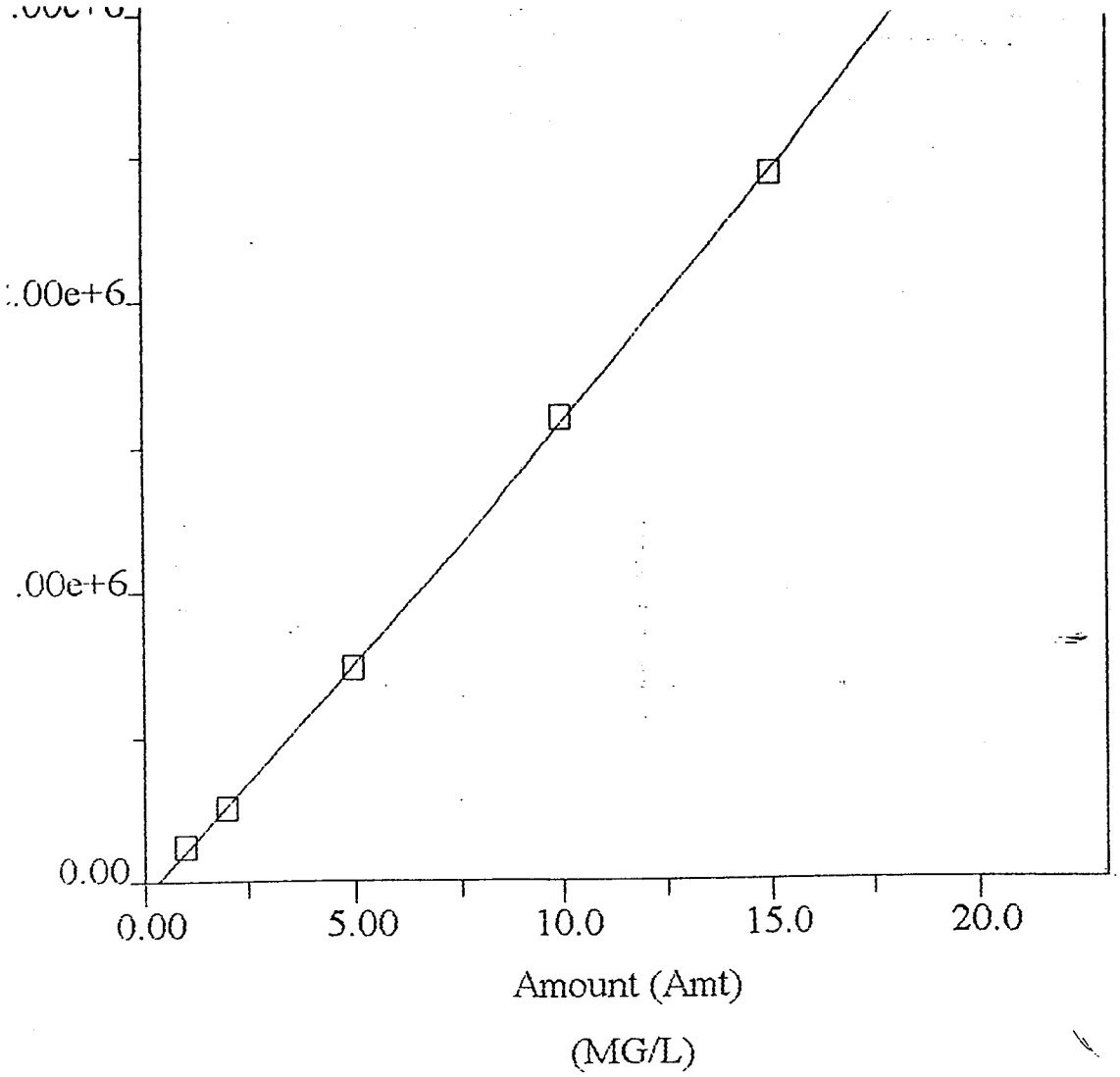
Amt = -1.666690e-013 * Resp² + 6.412661e-006 *

Resp + 0.3086

Standard: External

Calibration: Area





Component: CHLORIDE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

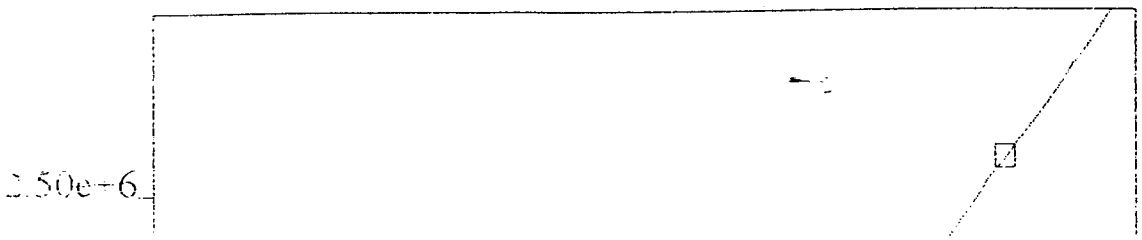
$r^2 = 0.999902$

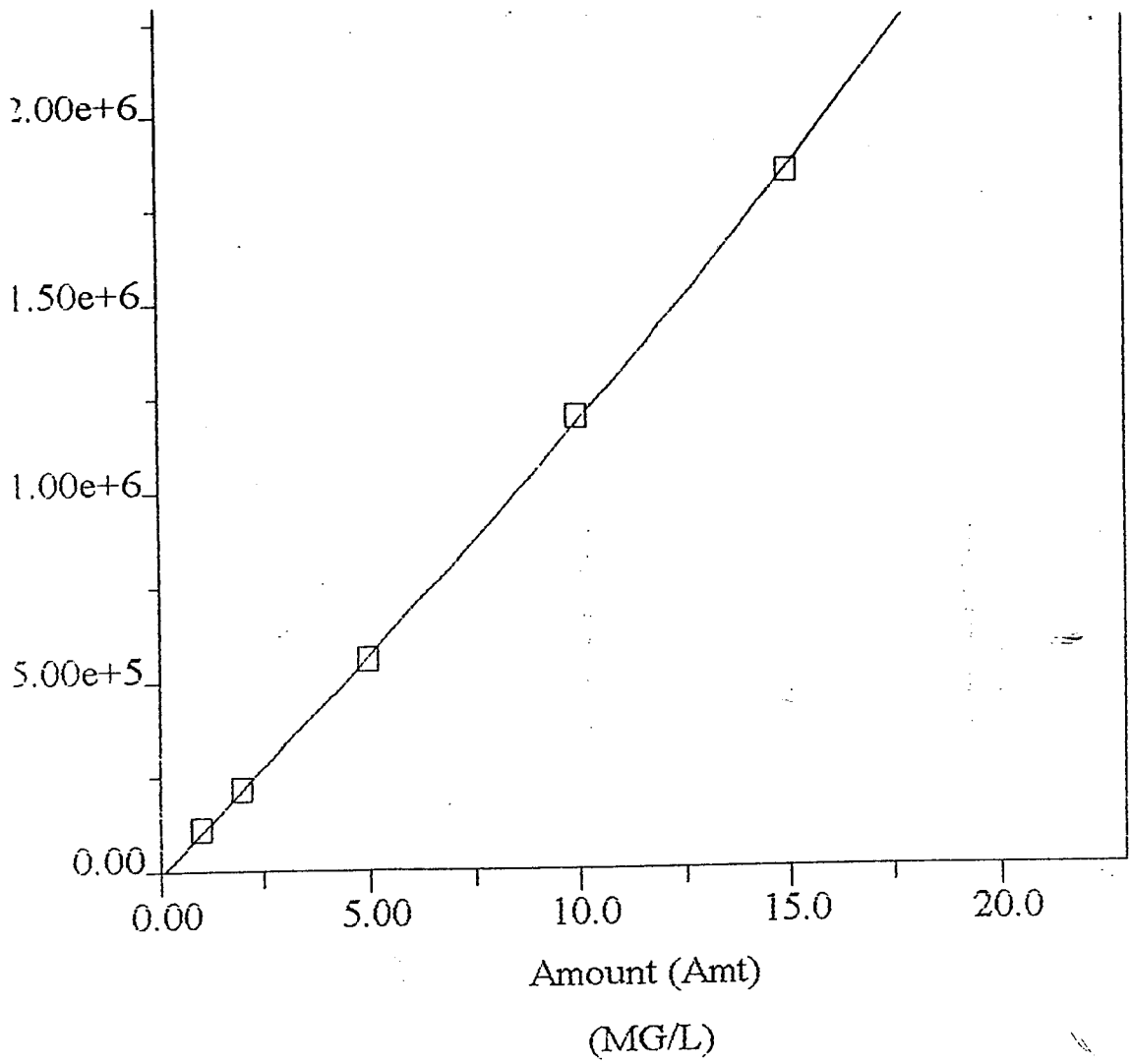
Amt = -4.913150e-013 * Resp² + 8.964130e-006 *

Resp + 0.0905

Standard: External

Calibration: Area





Component: NITRITE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

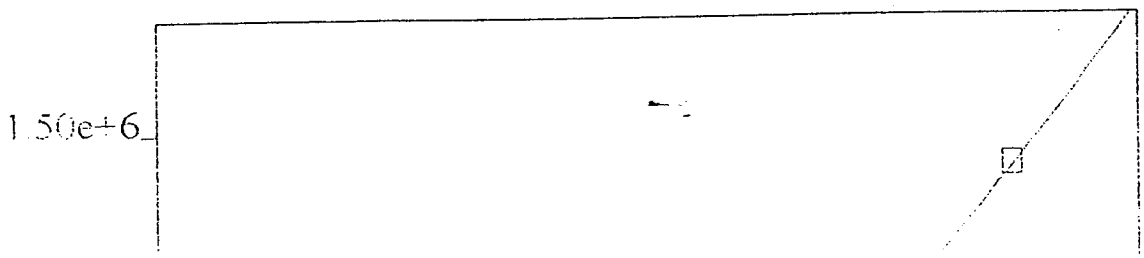
$r^2 = 0.999859$

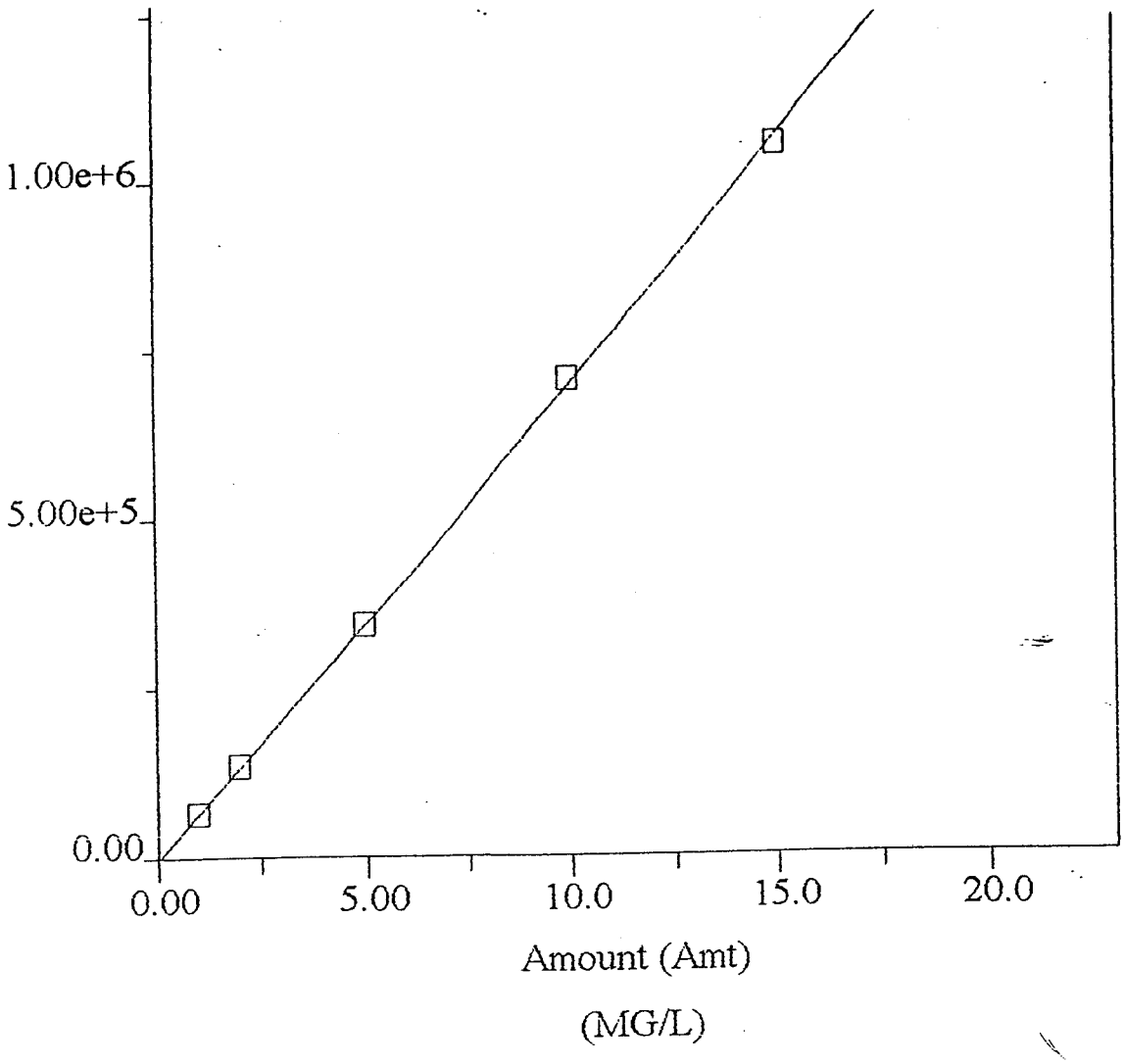
Amt = -6.358475e-013 * Resp² + 1.474889e-005 *

Resp + 0.03992

Standard: External

Calibration: Area





Component: BROMIDE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

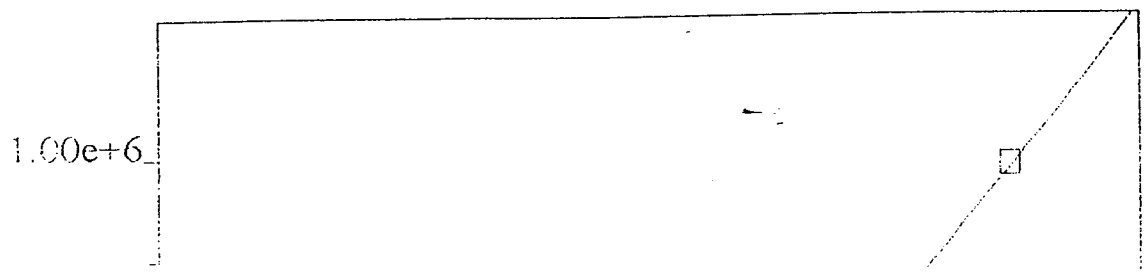
$r^2 = 0.999799$

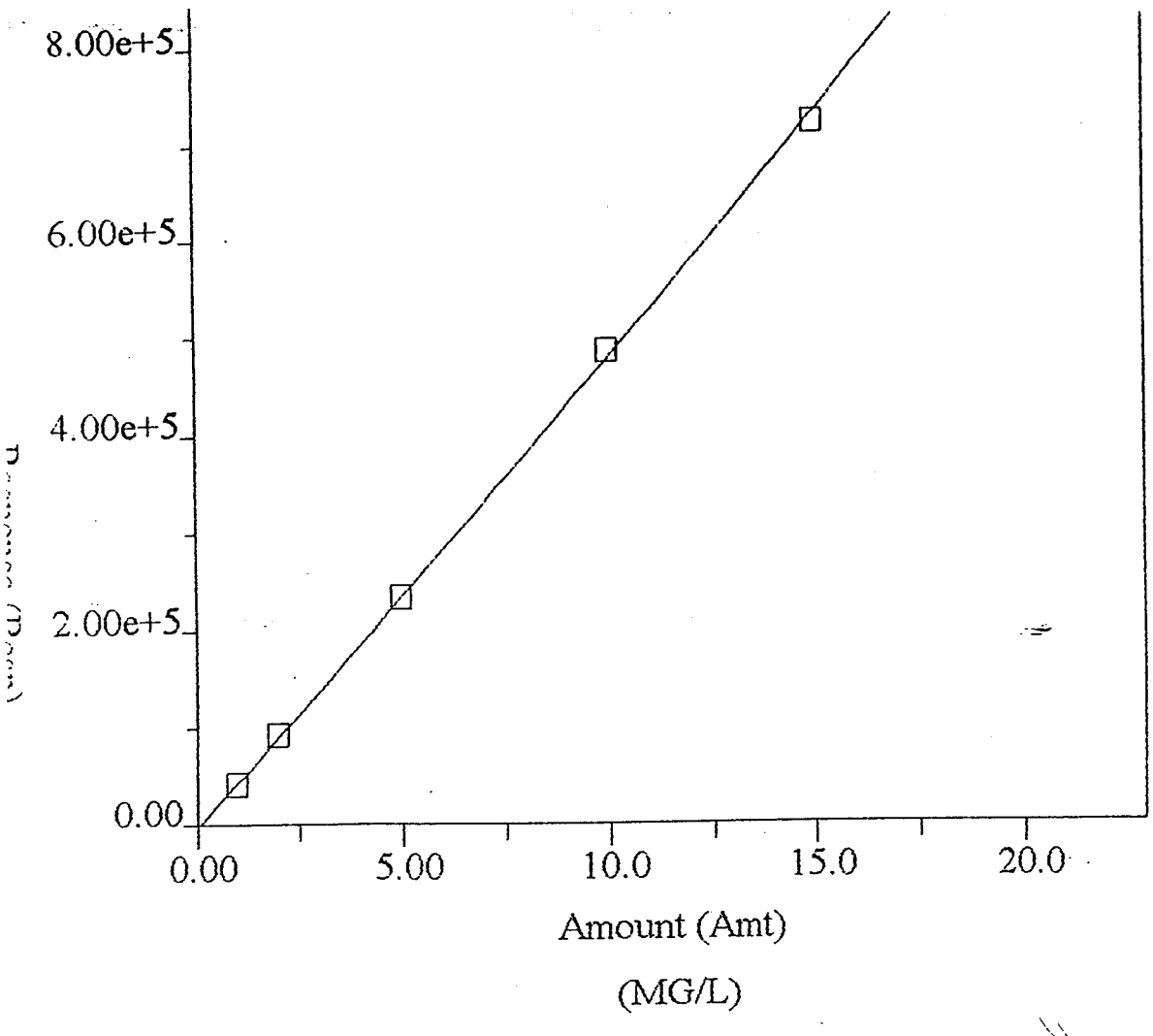
Amt = -1.177613e-012 * Resp² + 2.134629e-005 *

Resp + 0.07798

Standard: External

Calibration: Area





Component: NITRATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

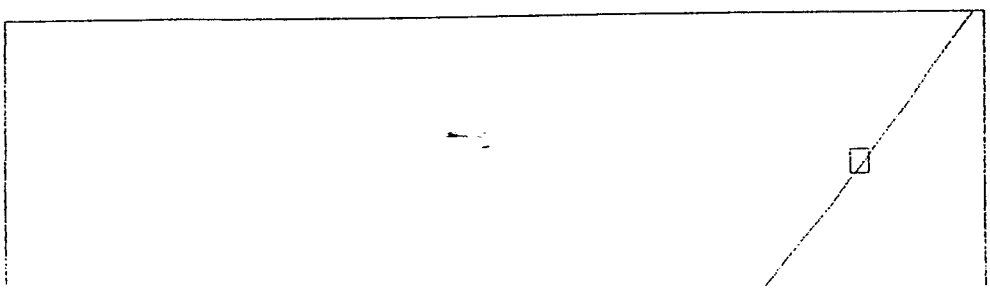
$r^2 = 0.999577$

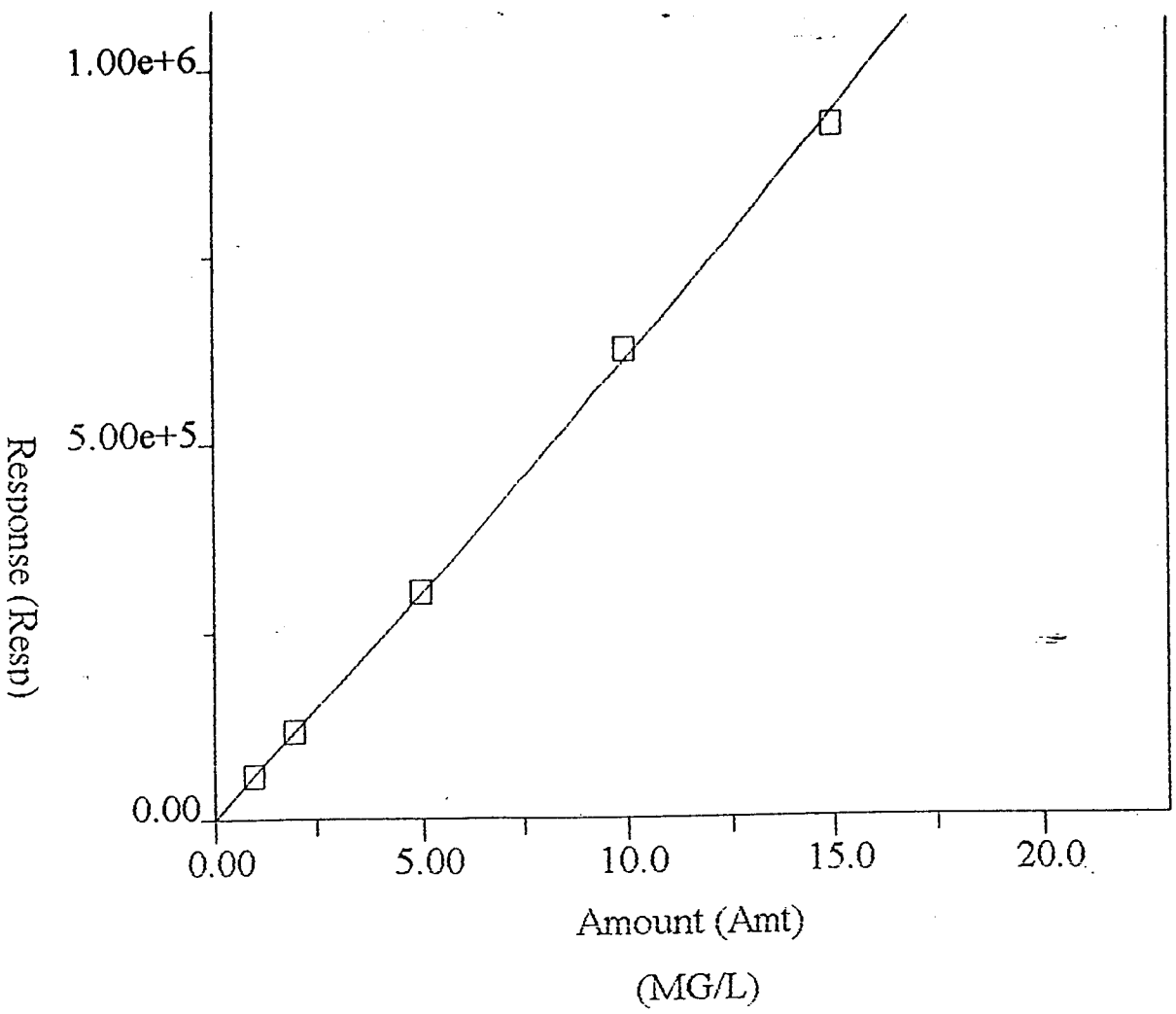
Amt = -1.115373e-012 * Resp² + 1.701592e-005 *

Resp + 0.003283

Standard: External

Calibration: Area





Component: PHOSPHATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

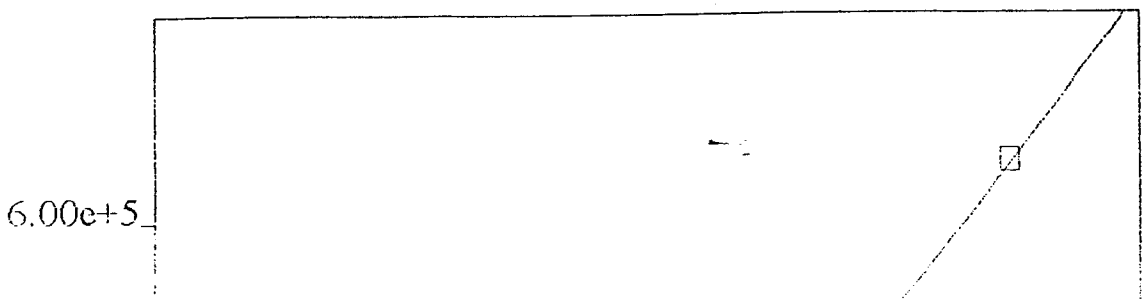
$r^2 = 0.999846$

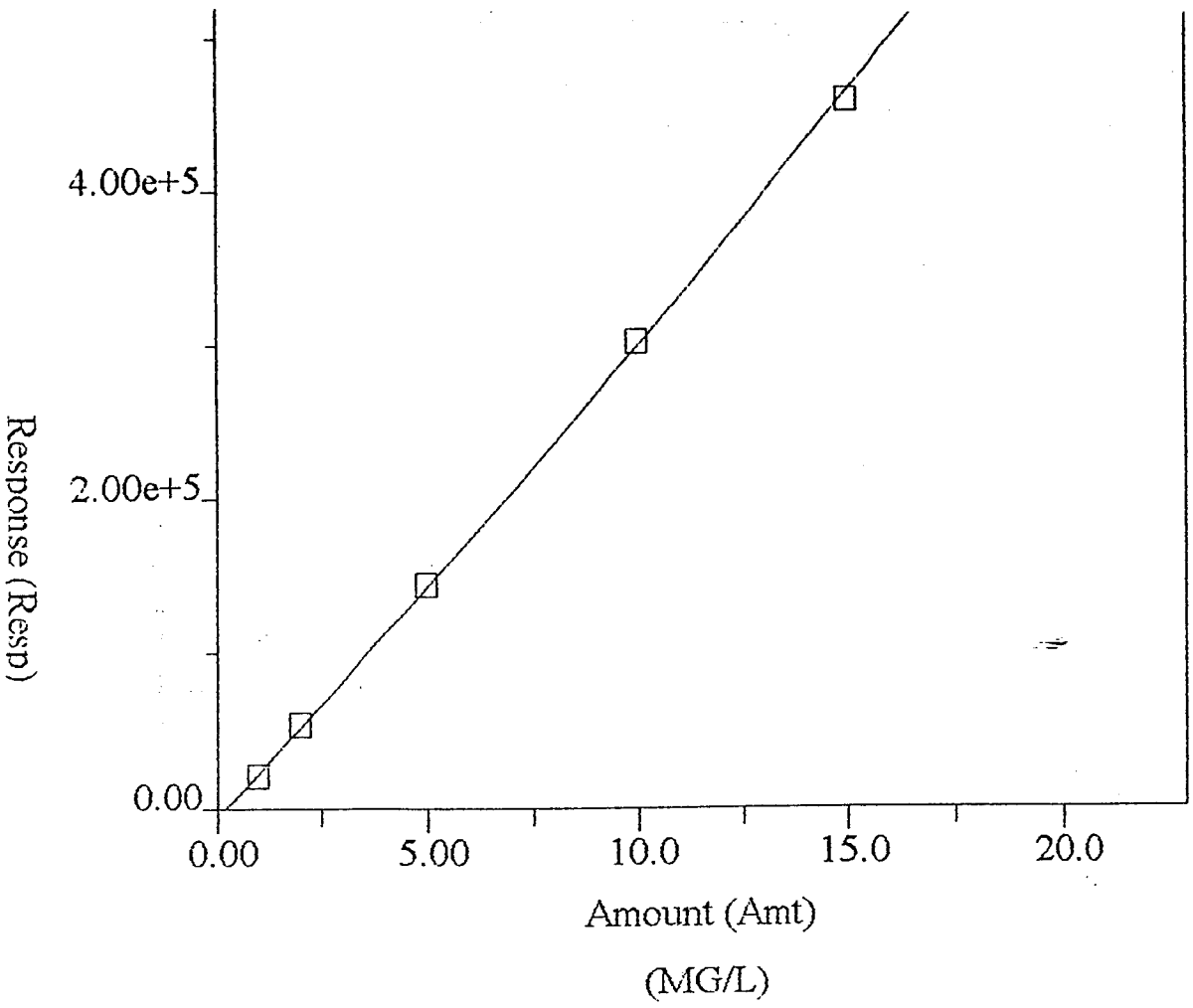
Amt = -5.106101e-012 * Resp² + 3.432998e-005 *

Resp + 0.2035

Standard: External

Calibration: Area





Component: SULFATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 P

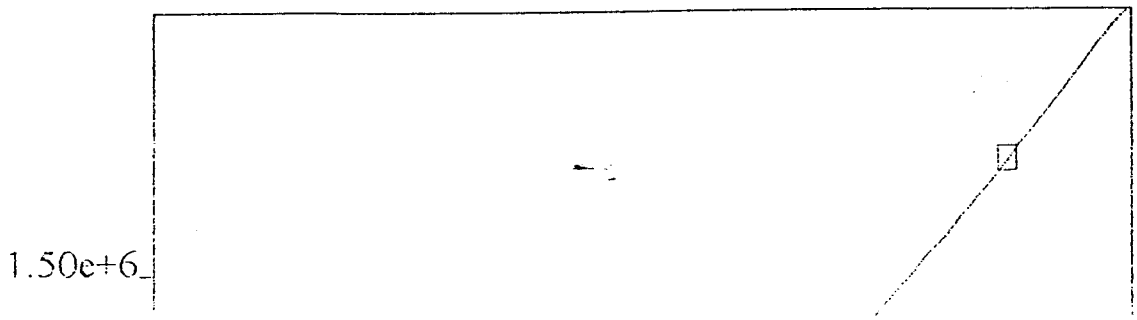
$r^2 = 0.999976$

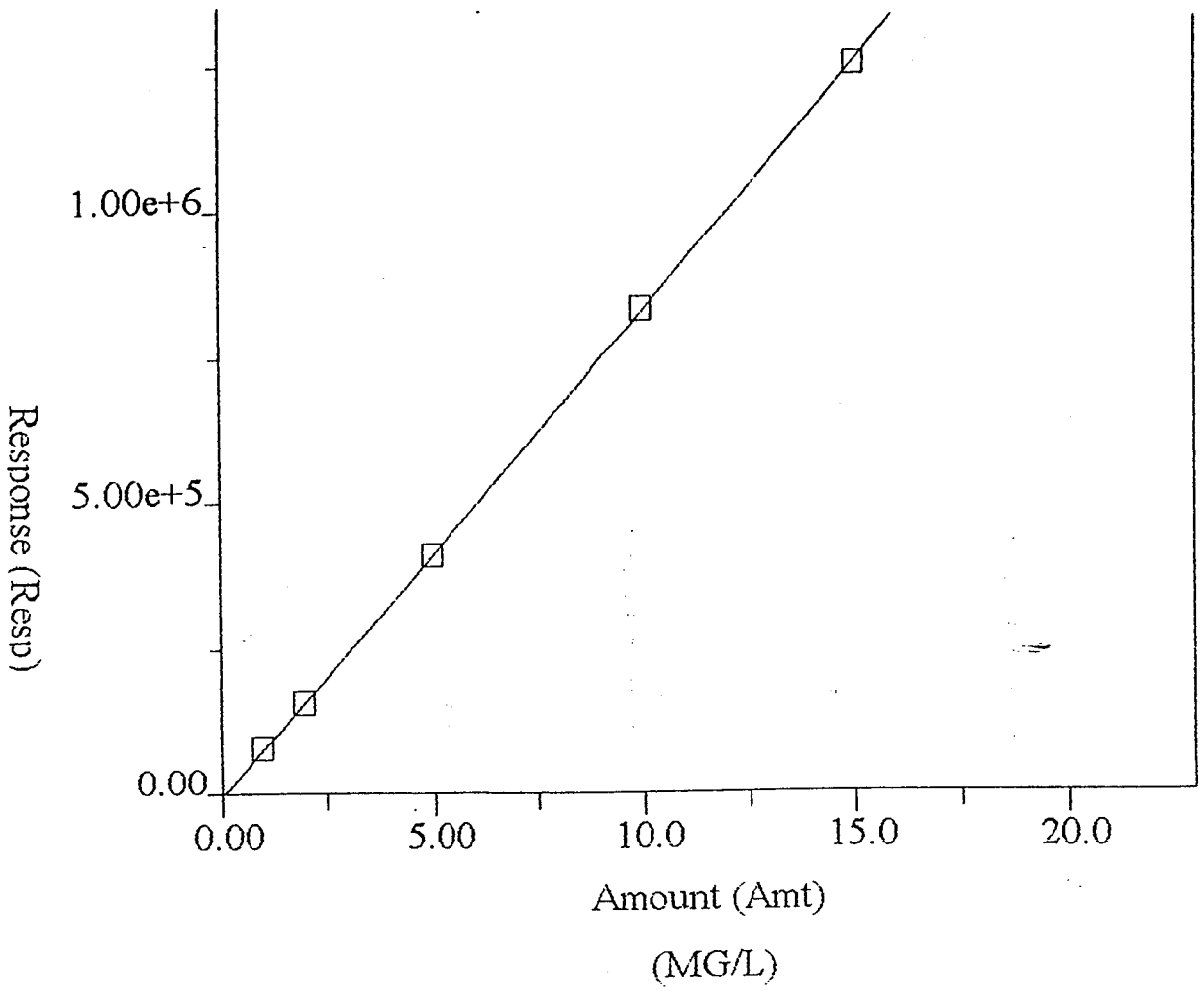
Amt = -2.367913e-013 * Resp² + 1.220891e-005 *

Resp + 0.04226

Standard: External

Calibration: Area





Data File : C:\PEAKNET\DATA\11169008.DXD		Report Date:	11/16/99 2:05:00 PM
Sample Name: METH BLK - B01		Collected :	11/16/99 1:52:53 PM
Inject # : 8		Vial # :	B01
Method File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
System Name: ANIONS		Detector :	CD20
Column Type:		Operator :	DK
Data Points: 3600		Rate :	5.00 Hz
Module Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

Calibration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
External	50	1	0.00	12.00	10	10.00	0.94

Filter type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delt
1	0.00	FLUORIDE	0.000	0	0	0	0.0
2	3.08	CHLORIDE	0.095	96	550	1	2.7
3	0.00	NITRITE	0.000	0	0	0	0.0
4	0.00	BROMIDE	0.000	0	0	0	0.0
5	0.00	NITRATE	0.000	0	0	0	0.0
6	0.00	PHOSPHATE	0.000	0	0	0	0.0

Totals	0.095	96	550

********** Component Report: Components Found **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delt
1	3.08	CHLORIDE	0.095	96	550	1	2.7
		Totals	0.095	96	550		

********** Components Not Found In This Run **********

Name	Adjusted Ret Time	Reference Peak
FLUORIDE	2.08	0
NITRITE	3.62	0
BROMIDE	4.58	0
NITRATE	5.37	0
PHOSPHATE	7.20	0
SULFATE	8.70	0

********** Peak Report: All Peaks **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

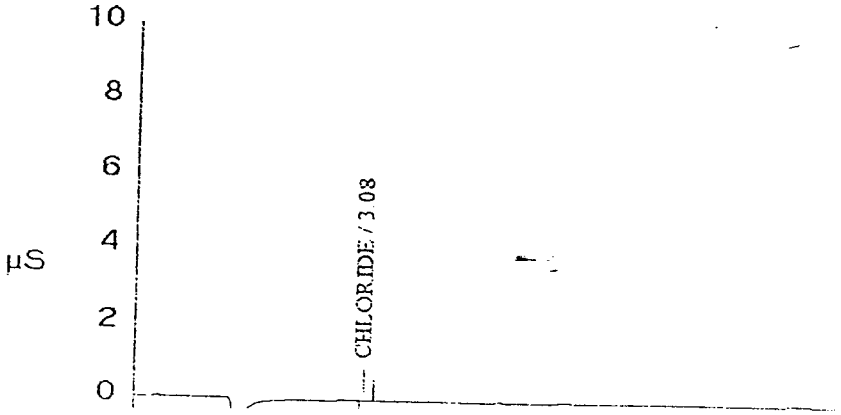
Schedule: \peaknet\schedule\11169901.sch
Release 4.30 Page 1 of 2 11/16/99 2:05:00 PM

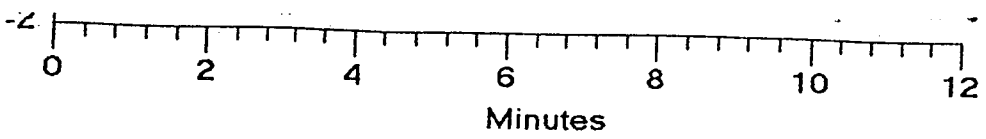
1	3.08	CHLORIDE	0.095	96	550	1	2.78
		Totals	0.095	96	550		

********** Peak Report: Unknown Peaks **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
		Totals	0.000	0	0		

File: 11169008.DXD Sample METH BLK - B01





Data File	: C:\PEAKNET\DATA\11169009.DXD	Report Date:	11/16/99 2:18:36 PM
Sample Name:	IPC - B02	Collected	: 11/16/99 2:06:29 PM
Inject #	: 9	Vial #	: B02
Method File:	c:\peaknet\method\acidscan.met	Calibrated	: 11/16/99 1:51:23 PM
System Name:	ANIONS	Detector	: CD20
Column Type:		Operator	: DK
Data Points:	3600	Rate	: 5.00 Hz
Module Name:	S/N 96020568 ID:24 Of 15	Moduleware	: 1.17

Calibration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
External	50	1	0.00	12.00	10	10.00	0.94

Filter type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.60
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	226906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.55
	6.78	SULFATE	4.609	17784	393444	1	0.56

********** Component Report: Components Found **********

k. um	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.80
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	228906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.93
7	8.78	SULFATE	4.809	17784	393444	1	0.96
		Totals	34.419	248188	2663354		

********** Peak Report: All Peaks **********

k. um	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.80
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	228906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.93

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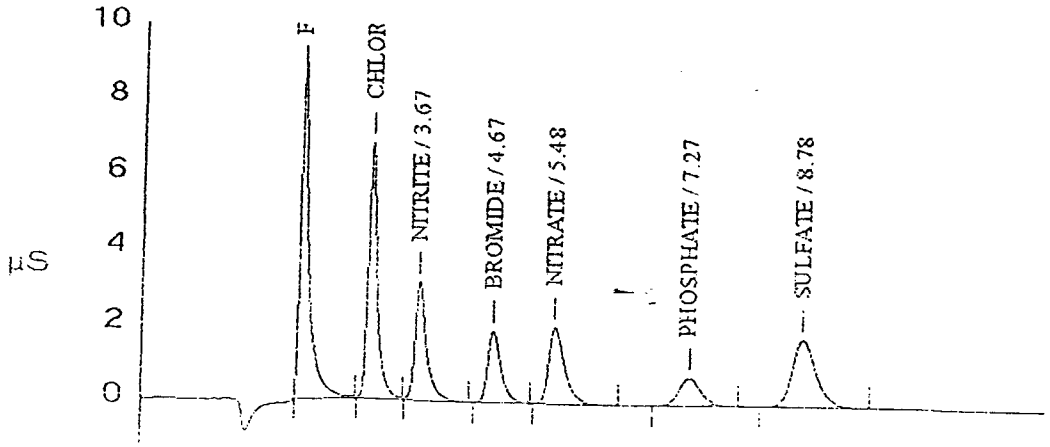
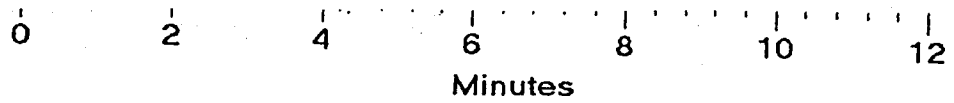
7	8.78	SULFATE	4.809	17784	393444	1	0.96
		Totals	34.419	248188	2663354		

********** Peak Report: Unknown Peaks **********

n	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
		Totals	0.000	0	0		

File: 11169009.DXD Sample IPC - B02





File : C:\PEAKNET\DATA\11169010.DXD	Report Date:	11/16/99	2:32:20 PM
le Name: QCS - B03	Collected :	11/16/99	2:20:12 PM
ct # : 10	Vial # :	B03	
od File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99	1:51:23 PM
em Name: ANIONS	Detector :	CD20	
mn Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
le Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17	

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.85	NITRITE	9.969	68122	695433	2	0.92
4.63	BROMIDE	10.085	40520	479134	2	1.09
5.43	NITRATE	10.112	42344	619199	2	1.24
7.55	PHOSPHATE	10.124	15247	302606	1	0.69
8.77	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	558683	5700589		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.65	NITRITE	9.989	66122	695433	2	0.92
4.63	BROMIDE	10.035	40320	479134	2	1.09
5.43	NITRATE	10.112	42344	619199	2	1.24
7.25	PHOSPHATE	10.124	15247	302606	1	0.69
8.77	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	556683	5700589		

********** Peak Report: All Peaks **********

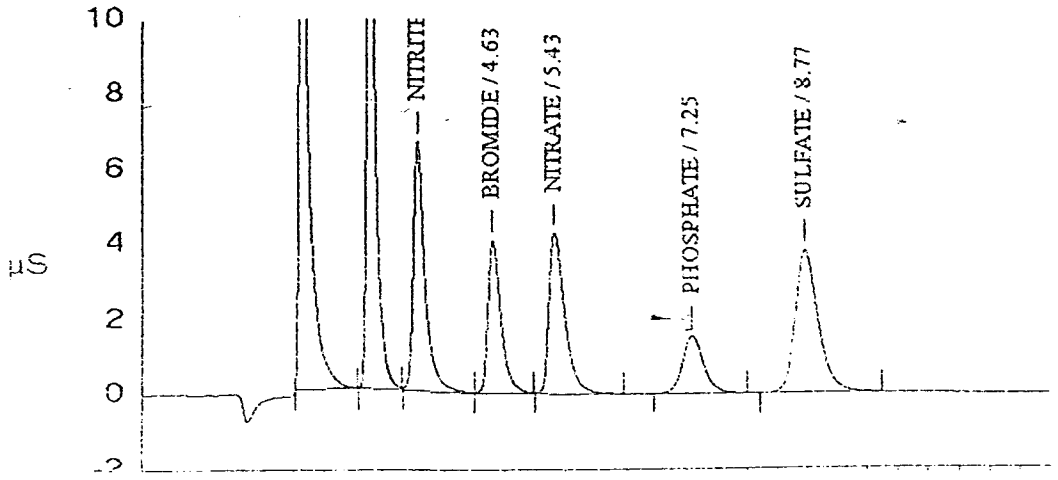
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.65	NITRITE	9.989	66122	695433	2	0.92
4.63	BROMIDE	10.035	40320	479134	2	1.09
5.43	NITRATE	10.112	42344	619199	2	1.24
7.25	PHOSPHATE	10.124	15247	302606	1	0.69

8.77	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	556683	5700589		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169010.DXD Sample QCS - B03



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e 4.30 Page 2 of 2 11/16/99 2:32:20 PM

File : C:\PEAKNET\DATA\11169011.DXD	Report Date:	11/16/99	2:46:02 PM
e Name: LCS - B04	Collected :	11/16/99	2:33:55 PM
t # : 11	Vial # :	B04	
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99	1:51:23 PM
n Name: ANIONS	Detector :	CD20	
n Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
e Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17	

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.03	CHLORIDE	10.061	153279	1189895	2	1.11
3.66	NITRITE	9.860	64400	686115	2	0.92
4.63	BROMIDE	9.796	39246	467311	2	1.09
5.45	NITRATE	10.115	42675	619377	2	1.55
[illegible]	PHOSPHATE	10.071	15345	300910	1	0.95
[illegible]	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	562106	5631955		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.03	CHLORIDE	10.061	153279	1189895	2	1.11
3.65	NITRITE	9.860	64400	686115	2	0.92
4.63	BROMIDE	9.796	39246	467311	2	1.09
5.45	NITRATE	10.115	42675	619377	2	1.55
7.27	PHOSPHATE	10.071	15345	300910	1	0.93
8.78	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	562106	5631955		

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.03	CHLORIDE	10.061	153279	1189895	2	1.11
3.65	NITRITE	9.860	64400	686115	2	0.92
4.63	BROMIDE	9.796	39246	467311	2	1.09
5.45	NITRATE	10.115	42675	619377	2	1.55
7.27	PHOSPHATE	10.071	15345	300910	1	0.93

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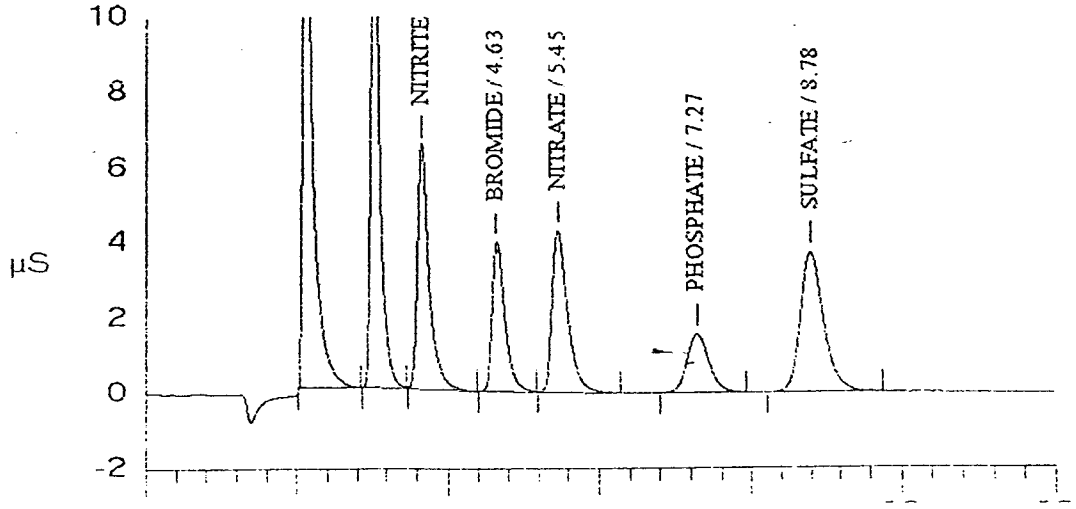
8.78	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	562106	5631955		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169011.DXD Sample LCS - B04



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File :	C:\PEAKNET\DATA\11169012.DXD	Report Date:	11/16/99 2:59:38 PM
le Name:	METH BLK - B01	Collected :	11/16/99 2:47:31 PM
ɔt # :	12	Vial # :	B01
ɔd File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
ɜm Name:	ANIONS	Detector :	CD20
ɜn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
ıal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
0.00	NITRITE	0.000	0	0	0	0.00
0.00	BROMIDE	0.000	0	0	0	0.00
0.00	NITRATE	0.000	0	0	0	0.00
0.00	PHOSPHATE	0.000	0	0	0	0.00
3.88	SULFATE	0.123	369	6581	1	2.11
	Totals	0.560	953	11228		

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
8.88	SULFATE	0.123	369	6581	1	2.11
	Totals	0.560	953	11228		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
:E	3.62	0
)E	4.58	0
:E	5.37	0
HATE	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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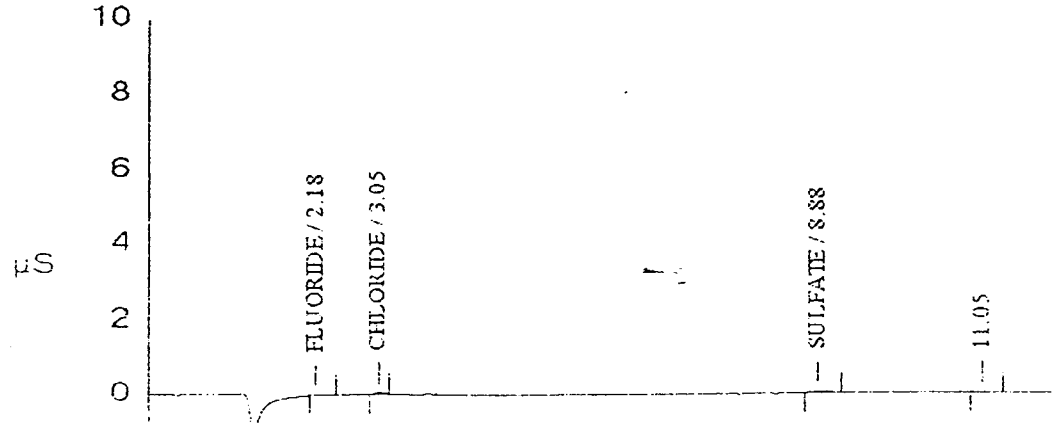
2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
8.88	SULFATE	0.123	369	6581	1	2.11
11.05		0.000	243	3334	1	
	Totals	0.560	1197	14562		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
11.05		0.000	243	3334	1	
	Totals	0.000	243	3334		

File: 11169012.DXD Sample METH BLK - B01



ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.17	FLUORIDE	0.362	1731	8379	1	4.00
3.12	CHLORIDE	9.354	110410	1099725	2	3.89
3.78	NITRITE	3.747	16773	254151	3	4.61
4.75	BROMIDE	0.397	920	14949	4	3.64
5.20	NITRATE	-2471.226	3460390	55312209	3	-3.11
7.37	PHOSPHATE	0.847	910	18802	4	2.31
8.58	SULFATE	150.055	1325252	31354811	1	-1.34
	Totals	-2306.463	4916385	88063026		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.17	FLUORIDE	0.362	1731	8379	1	4.00
3.12	CHLORIDE	9.354	110410	1099725	2	3.89
3.78	NITRITE	3.747	16773	254151	3	4.61
4.75	BROMIDE	0.397	920	14949	4	3.64
5.20	NITRATE	-2471.226	3460390	55312209	3	-3.11
7.37	PHOSPHATE	0.847	910	18802	4	2.31
8.58	SULFATE	150.055	1325252	31354811	1	-1.34
	Totals	-2306.463	4916385	88063026		

********** Peak Report: All Peaks **********

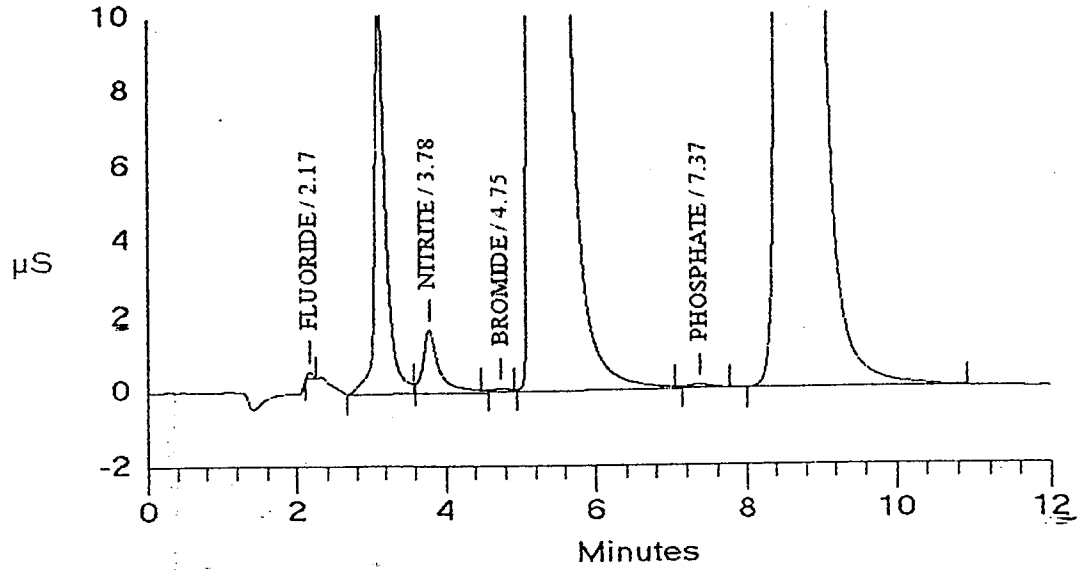
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.17	FLUORIDE	0.362	1731	8379	1	4.00
3.12	CHLORIDE	9.354	110410	1099725	2	3.89
3.78	NITRITE	3.747	16773	254151	3	4.61
4.75	BROMIDE	0.397	920	14949	4	3.64
5.20	NITRATE	-2471.226	3460390	55312209	3	-3.11
7.37	PHOSPHATE	0.847	910	18802	4	2.31

8.58	SULFATE	150.055	1325252	31354811	1	-1.34
	Totals	-2306.463	4916385	88063026		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

File: 11169047.DXD Sample 1382251 - C01



File :	C:\PEAKNET\DATA\11169048.DXD	Report Date:	11/16/99 11:37:09 PM
Name:	1382252 - C02	Collected :	11/16/99 11:25:02 PM
:	48	Vial # :	C02
File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
Name:	ANIONS	Detector :	CD20
Type:		Operator :	DK
:	3600	Rate :	5.00 Hz
Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.15	FLUORIDE	0.398	2655	13946	1	3.20
3.10	CHLORIDE	8.514	98370	993884	2	3.33
3.75	NITRITE	6.698	33993	460579	3	3.69
4.73	BROMIDE	0.285	722	9700	4	3.27
5.20	NITRATE	-2179.704	3281230	52487967	2	-3.11
0.00	PHOSPHATE	0.000	0	0	0	0.00
8.63	SULFATE	157.040	1083654	24521785	1	-0.77
	Totals	-2006.768	4500625	78487861		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.15	FLUORIDE	0.398	2655	13946	1	3.20
3.10	CHLORIDE	8.514	98370	993884	2	3.33
3.75	NITRITE	6.698	33993	460579	3	3.69
4.73	BROMIDE	0.285	722	9700	4	3.27
5.20	NITRATE	-2179.704	3281230	52487967	2	-3.11
8.63	SULFATE	157.040	1083654	24521785	1	-0.77
	Totals	-2006.768	4500625	78487861		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
NTE	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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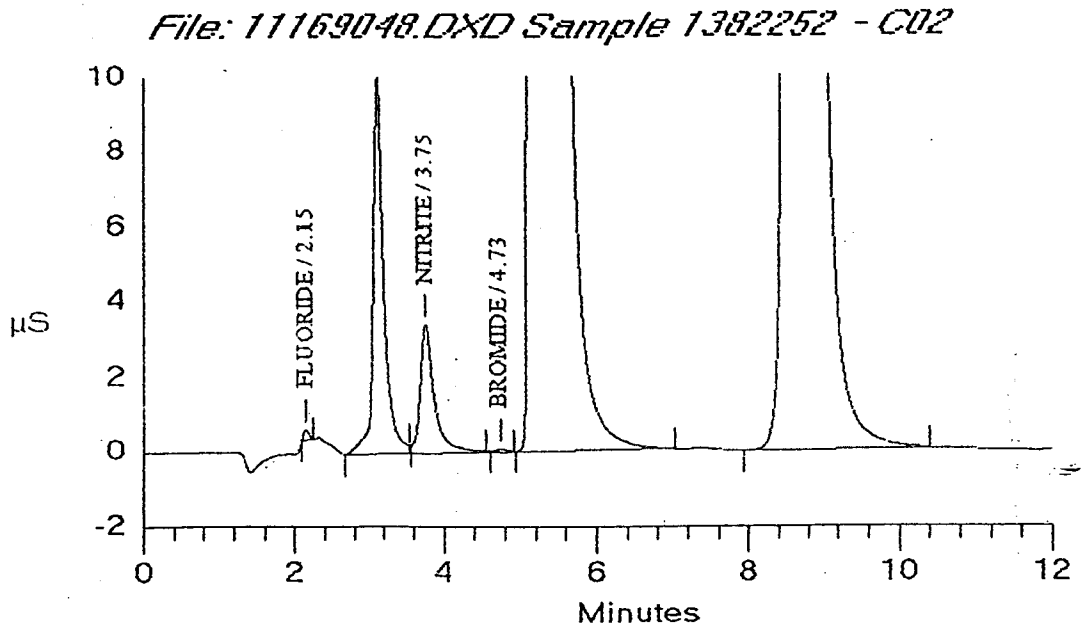
2.15	FLUORIDE	0.398	2655	13946	1	3.20
3.10	CHLORIDE	8.514	98370	993884	2	3.33
3.75	NITRITE	6.698	33993	460579	3	3.69
4.73	BROMIDE	0.285	722	9700	4	3.27
5.20	NITRATE	-2179.704	3281230	52487967	2	-3.11
8.63	SULFATE	157.040	1083654	24521785	1	-0.77
	Totals	-2006.768	4500625	78487861		

********** Peak Report: Unknown Peaks **********

Time	Name	MG/L		Code
Totals		0.000	0	0



File :	C:\PEAKNET\DATA\11169049.DXD	Report Date:	11/16/99 11:50:47 PM
e Name:	1382253 - C03	Collected :	11/16/99 11:38:39 PM
e # :	49	Vial # :	C03
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
n Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
oints:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	0.519	4120	32907	1	2.40
3.08	CHLORIDE	6.068	66935	693203	2	2.78
3.73	NITRITE	5.324	28739	363965	2	3.23
0.00	BROMIDE	0.000	0	0	0	0.00
5.20	NITRATE	-1167.854	2514224	40873053	1	-3.11
0.00	PHOSPHATE	0.000	0	0	0	0.00
8.65	SULFATE	150.190	917107	20256262	1	-0.57
	Totals	-1005.752	3531124	62219389		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	0.519	4120	32907	1	2.40
3.08	CHLORIDE	6.068	66935	693203	2	2.78
3.73	NITRITE	5.324	28739	363965	2	3.23
5.20	NITRATE	-1167.854	2514224	40873053	1	-3.11
8.65	SULFATE	150.190	917107	20256262	1	-0.57
	Totals	-1005.752	3531124	62219389		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
E	4.58	0
ATE	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

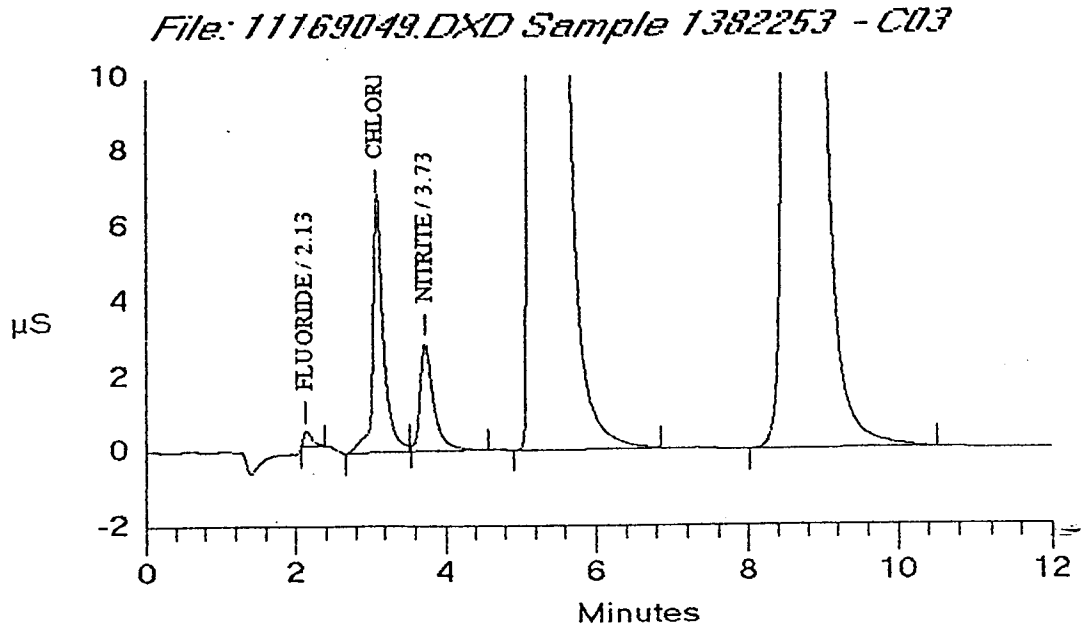
e: \peaknet\schedule\11169901.sch
4.30 Page 1 of 2 11/16/99 11:50:47 PM

2.13	FLUORIDE	0.519	4120	32907	1	2.40
3.08	CHLORIDE	6.068	66935	693203	2	2.78
3.73	NITRITE	5.324	28739	363965	2	3.23
5.20	NITRATE	-1167.854	2514224	40873053	1	-3.11
8.65	SULFATE	150.190	917107	20256262	1	-0.57
	Totals	-1005.752	3531124	62219389		

********** Peak Report: Unknown Peaks **********

Component	Concentration	Height	Area	Bl.	%Delta

Totals	0.000	0	0



File :	C:\PEAKNET\DATA\11169050.DXD	Report Date:	11/17/99 12:04:30 AM
le Name:	1382253 DUP - C04	Collected :	11/16/99 11:52:22 PM
# :	50	Vial # :	C04
File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
Name:	ANIONS	Detector :	CD20
Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

Volume Dilution Start Stop Area Reject Pk. Width Threshold

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	0.389	2573	12552	1	2.40
3.10	CHLORIDE	7.605	89330	880835	2	3.33
3.73	NITRITE	6.636	35001	456165	3	3.23
4.75	BROMIDE	0.217	502	6516	4	3.64
5.20	NITRATE	-1544.539	2816819	45614241	2	-3.11
0.00	PHOSPHATE	0.000	0	0	0	0.00
8.63	SULFATE	155.272	1016790	22771643	1	-0.77
	Totals	-1374.421	3961015	69741952		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	0.389	2573	12552	1	2.40
3.10	CHLORIDE	7.605	89330	880835	2	3.33
3.73	NITRITE	6.636	35001	456165	3	3.23
4.75	BROMIDE	0.217	502	6516	4	3.64
5.20	NITRATE	-1544.539	2816819	45614241	2	-3.11
8.63	SULFATE	155.272	1016790	22771643	1	-0.77
	Totals	-1374.421	3961015	69741952		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
[illegible]	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

[illegible]: \peaknet\schedule\11169901.sch
[illegible] 4.30 Page 1 of 2 11/17/99 12:04:30 AM

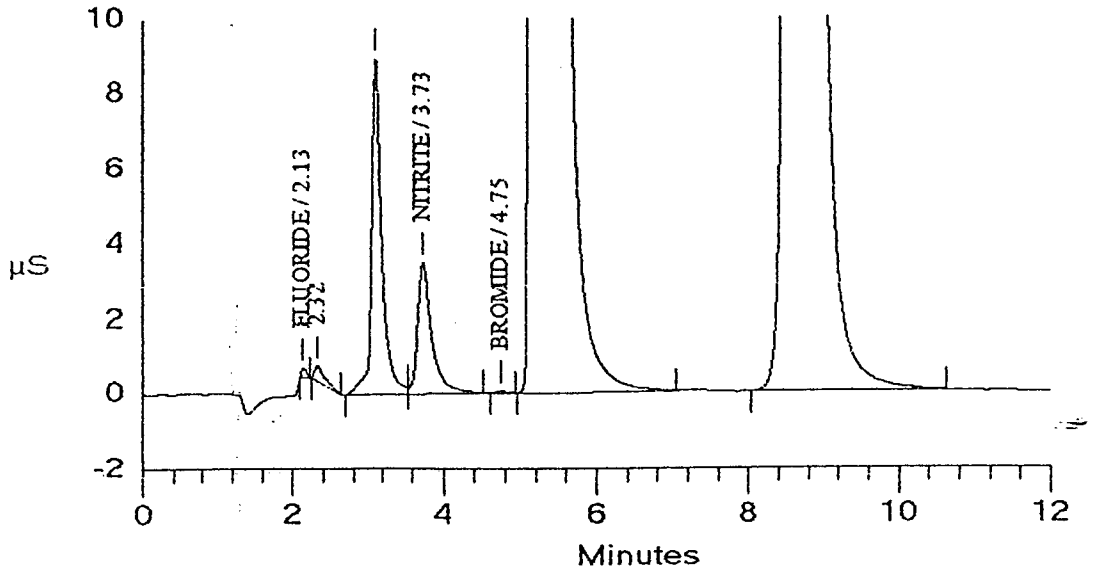
2.13	FLUORIDE	0.389	2573	12552	1	2.40
2.32		0.000	3843	36667	1	
3.10	CHLORIDE	7.605	89330	880835	2	3.33
3.73	NITRITE	6.636	35001	456165	3	3.23
4.75	BROMIDE	0.217	502	6516	4	3.64
5.20	NITRATE	-1544.539	2816819	45614241	2	-3.11
8.63	SULFATE	155.272	1016790	22771643	1	-0.77
	Totals	-1374.421	3964858	69778613		

********** Peak Report: Unknown Peaks **********

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

2.32	0.000	3843	36667	1
Totals	0.000	3843	36667	

File: 11169050.DXD Sample 1382253 DUP - C04



File : C:\PEAKNET\DATA\11169051.DXD		Report Date:	11/17/99 12:18:12 AM
e Name: 1382253 MS - C05		Collected :	11/17/99 12:06:04 AM
t # : 51		Vial # :	C05
d File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
n Name: ANIONS		Detector :	CD20
n Type:		Operator :	DK
ints: 3600		Rate :	5.00 Hz
e Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

n	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.678	173307	1521270	1	1.60
3.08	CHLORIDE	16.378	228752	2046508	2	2.78
3.70	NITRITE	10.957	65568	765426	2	2.30
4.68	BROMIDE	9.636	40179	459391	2	2.18
5.18	NITRATE	-1213.255	2539548	41479715	2	-3.42
7.33	PHOSPHATE	6.593	8358	191580	2	1.85
8.63	SULFATE	152.260	952091	21114469	2	-0.77
	Totals	-1007.753	4007804	67578358		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.678	173307	1521270	1	1.60
3.08	CHLORIDE	16.378	228752	2046508	2	2.78
3.70	NITRITE	10.957	65568	765426	2	2.30
4.68	BROMIDE	9.636	40179	459391	2	2.18
5.18	NITRATE	-1213.255	2539548	41479715	2	-3.42
7.33	PHOSPHATE	6.593	8358	191580	2	1.85
8.63	SULFATE	152.260	952091	21114469	2	-0.77
	Totals	-1007.753	4007804	67578358		

********** Peak Report: All Peaks **********

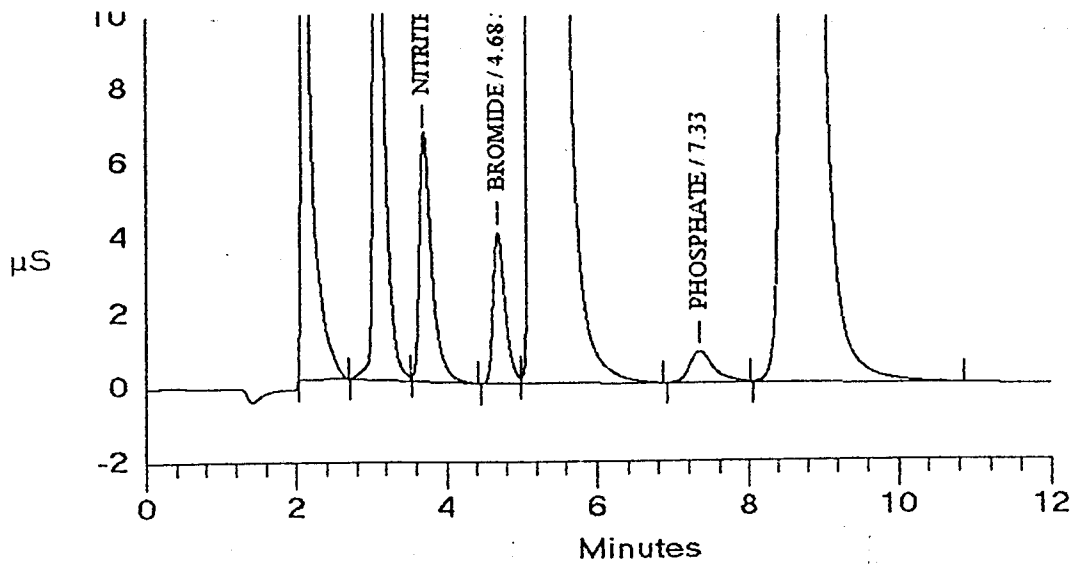
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.678	173307	1521270	1	1.60
3.08	CHLORIDE	16.378	228752	2046508	2	2.78
3.70	NITRITE	10.957	65568	765426	2	2.30
4.68	BROMIDE	9.636	40179	459391	2	2.18
5.18	NITRATE	-1213.255	2539548	41479715	2	-3.42
7.33	PHOSPHATE	6.593	8358	191580	2	1.85

8.63	SULFATE	152.260	952091	21114469	2	-0.77
	Totals	-1007.753	4007804	67578358		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169901.D Sample 1999253.MS - 005



T.V. SPIKE = 10.00 mg/L

CHLORIDE $\frac{16.378 - 6.07}{10.00} \times 100 = 103\%$

le: \peaknet\schedule\11169901.sch
e 4.30 Page 2 of 2 11/17/99 12:18:12 AM

File : C:\PEAKNET\DATA\11169052.DXD	Report Date:	11/17/99 12:31:54 AM
e Name: 1382253 MSD - C06	Collected :	11/17/99 12:19:47 AM
t # : 52	Vial # :	C06
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name: ANIONS	Detector :	CD20
n Type:	Operator :	DK
ints: 3600	Rate :	5.00 Hz
Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ion	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
	50	1	0.00	12.00	10	10.00	0.94

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.962	173337	1569461	1	1.60
3.10	CHLORIDE	16.604	241589	2079071	2	3.33
3.72	NITRITE	10.942	66726	764371	2	2.76
4.68	BROMIDE	9.869	40806	470907	2	2.18
5.20	NITRATE	-1253.926	2600597	42014086	2	-3.11
7.35	PHOSPHATE	6.843	8826	199320	2	2.08
8.63	SULFATE	152.813	960341	21371511	2	-0.77
	Totals	-1046.893	4092222	68468727		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.962	173337	1569461	1	1.60
3.10	CHLORIDE	16.604	241589	2079071	2	3.33
3.72	NITRITE	10.942	66726	764371	2	2.76
4.68	BROMIDE	9.869	40806	470907	2	2.18
5.20	NITRATE	-1253.926	2600597	42014086	2	-3.11
7.35	PHOSPHATE	6.843	8826	199320	2	2.08
8.63	SULFATE	152.813	960341	21371511	2	-0.77
	Totals	-1046.893	4092222	68468727		

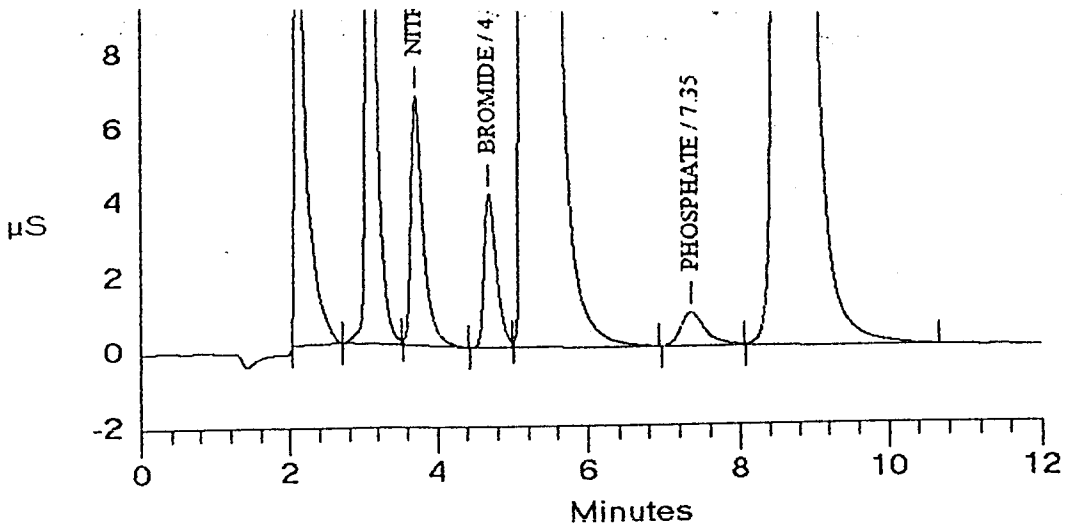
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.962	173337	1569461	1	1.60
3.10	CHLORIDE	16.604	241589	2079071	2	3.33
3.72	NITRITE	10.942	66726	764371	2	2.76
4.68	BROMIDE	9.869	40806	470907	2	2.18
5.20	NITRATE	-1253.926	2600597	42014086	2	-3.11
7.35	PHOSPHATE	6.843	8826	199320	2	2.08

8.63	SULFATE	152.813	960341	21371511	2	-0.77
	Totals	-1046.893	4092222	68468727		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

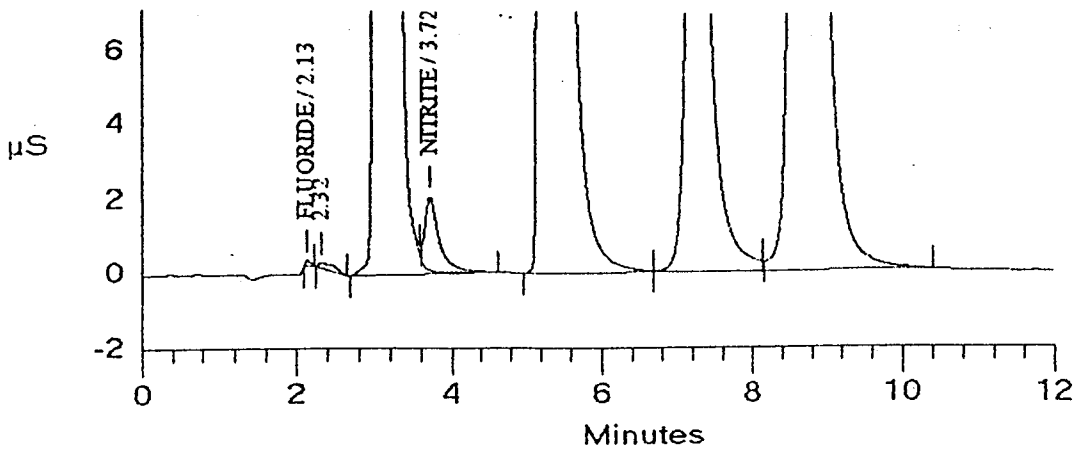


T.V. SPIKE = 10.00 mg/L

CHLORIDE $\frac{16.604 - 6.07}{10.00} \times 100 = 105\%$

File : C:\PEAKNET\DATA\11169053.DXD	Report Date:	11/17/99 12:45:37 AM	
e Name: 1382326 - C07	Collected :	11/17/99 12:33:29 AM	
t # : 53	Vial # :	C07	
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM	
m Name: ANIONS	Detector :	CD20	
n Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17	

Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
50	1	0.00	12.00	10	10.00	0.94



ile : C:\PEAKNET\DATA\11169061.DXD	Report Date:	11/17/99 2:35:03 AM
Name: CONTROL 1:50 - C15	Collected :	11/17/99 2:22:55 AM
# : 61	Vial # :	C15
File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
Name: ANIONS	Detector :	CD20
Type:	Operator :	DK
oints: 3600	Rate :	5.00 Hz
Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
1	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

**** Component Report: All Components ****

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]	FLUORIDE	0.000	0	0	0	0.00
[illegible]	CHLORIDE	4.102	84781	456058	1	1.67
[illegible]	NITRITE	0.000	0	0	0	0.00

7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112665	1317814		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.05	CHLORIDE	4.102	54781	459058	1	1.67
5.48	NITRATE	13.602	57161	846111	1	2.17
7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112665	1317814		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
DE	2.08	0
B	3.62	0
E	4.58	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

le: \peaknet\schedule\11169901.sch
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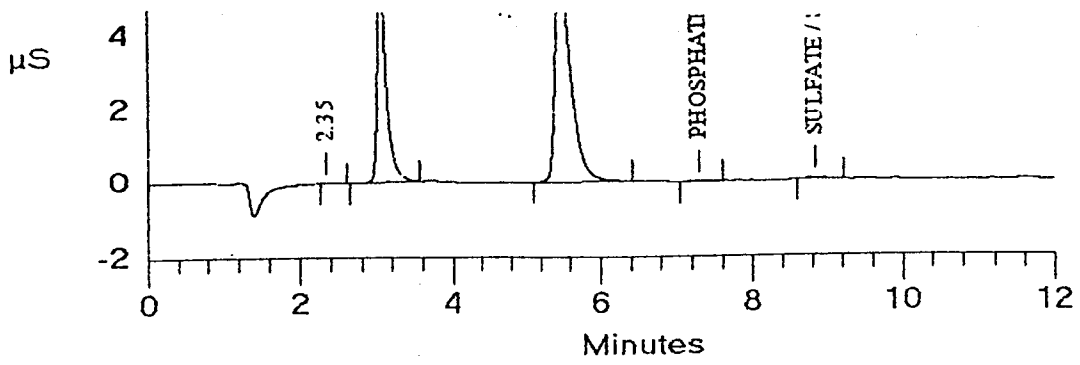
2.35		0.000	214	2658	1	
3.05	CHLORIDE	4.102	54781	459058	1	1.67
5.48	NITRATE	13.602	57161	846111	1	2.17
7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112879	1320471		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.35		0.000	214	2658	1	
	Totals	0.000	214	2658		

File: 11169061.DXD Sample CONTROL 1:50 - C15



ule: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/17/99 2:35:03 AM

File : C:\PEAKNET\DATA\11169062.DXD	Report Date:	11/17/99 2:48:38 AM	
le Name: METH BLK - B01	Collected :	11/17/99 2:36:31 AM	
t # : 62	Vial # :	B01	
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM	
m Name: ANIONS	Detector :	CD20	
n Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
e Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17	

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
.20	FLUORIDE	0.006	0	0	0	0.00
.47	CHLORIDE	0.118	447	3084	1	2.22
..	NITRITE	0.000	0	0	0	0.00
..	BROMIDE	0.000	0	0	0	0.00

8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	863	11776		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.07	CHLORIDE	0.118	447	3024	1	2.22
8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	863	11776		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
IDE	2.08	0
TE	3.62	0
DE	4.58	0
CE	5.37	0
IATE	7.20	0

********** Peak Report: All Peaks **********

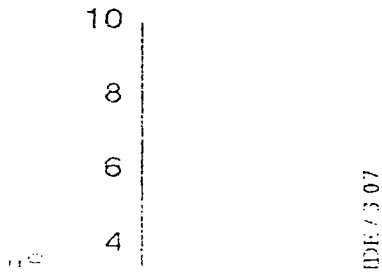
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.52		0.000	32	241	1	
3.07	CHLORIDE	0.118	447	3024	1	2.22
8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	894	12017		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.52		0.000	32	241	1	
	Totals	0.000	32	241		

File: 11169062.DXD Sample METH BLK - B01



:le: \peaknet\schedule\11169901.sch
:e 4.30 Page 2 of 2 11/17/99 2:48:38 AM

File :	C:\PEAKNET\DATA\11169063.DXD	Report Date :	11/17/99 3:02:20 AM
e Name:	IPC - B02	Collected :	11/17/99 2:50:13 AM
t # :	63	Vial # :	B02
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

**************** Component Report: All Components **************************

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]	FLUORIDE	4.823	57835	717314	1	1.80
[illegible]	CHLORIDE	4.848	66890	547168	1	1.67
[illegible]	[illegible]	4.860	30445	333918	2	1.84
[illegible]	[illegible]	4.8[illegible]1	18410	128338	1	1.18
[illegible]	[illegible]	5.[illegible]47	18068	[illegible]2430	1	[illegible]
[illegible]	[illegible]	5.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Totals	34.321	247754	2665521

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	4.823	87385	717314	1	1.60
3.05	CHLORIDE	4.848	66890	547168	2	1.67
3.68	NITRITE	4.880	30445	332918	2	1.84
4.68	BROMIDE	4.901	18410	228838	2	2.18
5.52	NITRATE	5.047	19968	302430	2	2.80
7.30	PHOSPHATE	5.007	6954	142968	1	1.39
8.80	SULFATE	4.814	17703	393886	1	1.15
	Totals	34.321	247754	2665521		

********** Peak Report: All Peaks **********

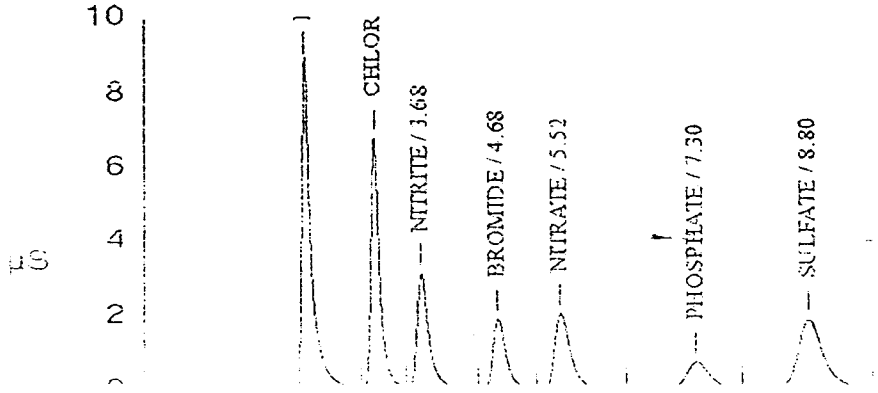
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	4.823	87385	717314	1	1.60
3.05	CHLORIDE	4.848	66890	547168	2	1.67
3.68	NITRITE	4.880	30445	332918	2	1.84
4.68	BROMIDE	4.901	18410	228838	2	2.18
5.52	NITRATE	5.047	19968	302430	2	2.80
7.30	PHOSPHATE	5.007	6954	142968	1	1.39

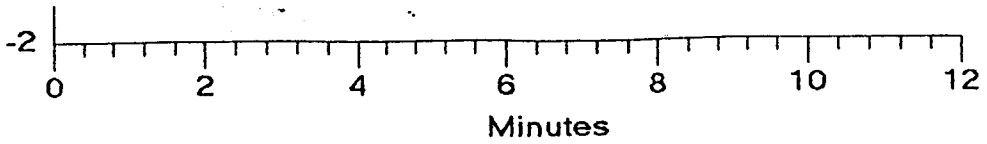
8.80	SULFATE	4.814	17703	393886	1	1.15
	Totals	34.321	247754	2665521		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169063.DXD Sample IPC - 802





ıle: \peaknet\schedule\11169901.sch
:e 4.30 Page 2 of 2 11/17/99 3:02:20 AM

File :	C:\PEAKNET\DATA\11169064.DXD	Report Date:	11/17/99 3:16:03 AM
e Name:	LCS - B04	Collected :	11/17/99 3:03:55 AM
t # :	64	Vial # :	B04
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]	FLUORIDE	10.054	204650	1585087	1	1.60
[illegible]	CHLORIDE	10.087	143700	1193218	2	1.11
[illegible]	NITRITE	9.879	63307	687469	2	1.38
[illegible]	BROMIDE	9.342	38777	469579	2	1.82
[illegible]	NITRATE	10.144	42078	621225	2	2.17
[illegible]	PHOSPHATE	10.240	14860	306310	1	1.16
[illegible]	SULFATE	9.[illegible]	[illegible]	795791	1	0.98

Totals

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	10.054	204650	1585087	1	1.60
3.03	CHLORIDE	10.087	143700	1193218	2	1.11
3.67	NITRITE	9.879	63307	687469	2	1.38
4.67	BROMIDE	9.842	38777	469579	2	1.82
5.48	NITRATE	10.144	42078	621225	2	2.17
7.28	PHOSPHATE	10.240	14860	306310	1	1.16
8.78	SULFATE	9.608	36454	795791	1	0.96
	Totals	69.854	543826	5658679		

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	10.054	204650	1585087	1	1.60
3.03	CHLORIDE	10.087	143700	1193218	2	1.11
3.67	NITRITE	9.879	63307	687469	2	1.38
4.67	BROMIDE	9.842	38777	469579	2	1.82
5.48	NITRATE	10.144	42078	621225	2	2.17
7.28	PHOSPHATE	10.240	14860	306310	1	1.16

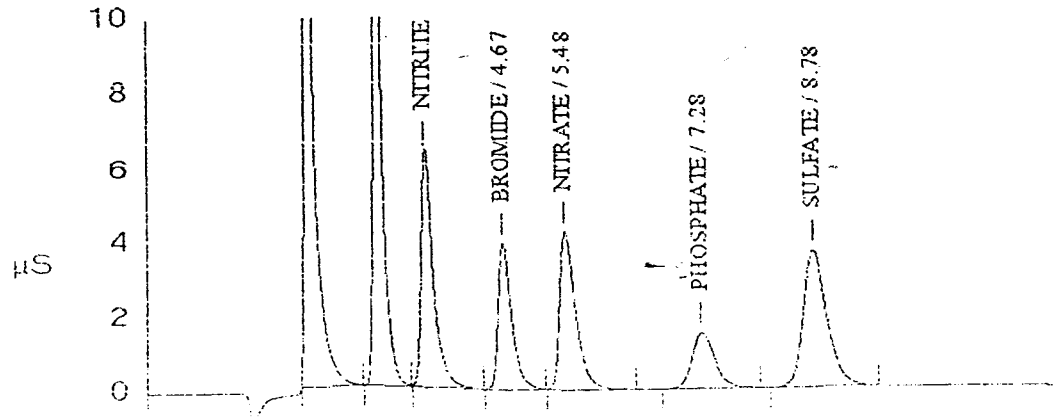
le: \peaknet\schedule\11169901.sch
e 4.30 Page 1 of 2 11/17/99 3:16:03 AM

8.78	SULFATE	9.608	36454	795791	1	0.96
	Totals	69.854	543826	5658679		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169064.DXD Sample LCS - B04



ONTARIO HYDRO SAMPLES ANALYTICAL REPORT

PHILIP
ANALYTICAL SERVICES

INDUSTRIAL HYGIENE **ENVIRONMENTAL TESTING**

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

December 3, 1999

Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Laboratory Project: 187900
Client Reference: Ontario Hydro Method/SMEPA, R.D. Morrow

Dear Mr. O'Neill:

The samples which were logged in on 09-NOV-99 have been analyzed as requested. The analytical results are enclosed in the attached report.

Please note that any unused portion of the samples will be disposed after 22-DEC-99, unless you have requested otherwise.

Thank you for the opportunity to provide these services to you. If you have any questions concerning this report, please contact a Client Services representative at 610/921-8833.

Sincerely,

Fred Usbeck, CIH
Director, Laboratory Services

ro: Jack Mills, Roy F. Weston, Inc.
rc: Jeff O'Neill, Roy F. Weston, Inc.

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

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

ANALYTICAL REPORT

Client: Roy F. Weston, Inc.

Report to: Jack Mills
Roy F. Weston, Inc.
Weston Way
West Chester PA 19380-1499

Project: 187900
Received: 08-NOV-99
Reported: 03-DEC-99

PURCHASE ORDER: 0008273

Copy to: Jeff O'Neill, Roy F. Weston, Inc.

Project Description: Ontario Hydro Method/SMEPA, R.D. Morrow

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-OUT-1-OHM-26OCT1999-FHHNO3/FILT (W207)					
Lab Sample: 1382157					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.08	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-1-OHM-26OCT1999-BHKCL					
Lab Sample: 1382158					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	2.99	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-OUT-1-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382159					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	0.46	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-1-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382160					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	6.79	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 7.25 ug					

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ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-FHHNO3/FILT (W208)					
Lab Sample: 1382161					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.048	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHKCL					
Lab Sample: 1382162					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	2.72	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382163					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.57	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382164					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	6.27	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.84 ug					
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-FHHNO3/FILT (W209)					
Lab Sample: 1382165					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.051	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHKCL					
Lab Sample: 1382166					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	1.63	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					

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PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382167					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.49	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382168					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	6.11	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.60 ug					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-FHHNO3/FILT					
Lab Sample: 1382169					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.021	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHKCL					
Lab Sample: 1382170					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382171					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.17	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382172					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = < 0.17 ug					

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ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-FHHNO3/FILT (W208)					
Lab Sample: 1382161					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.048	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHKCL					
Lab Sample: 1382162					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	2.72	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382163					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.57	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-2-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382164					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	6.27	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.84 ug					
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-FHHNO3/FILT (W209)					
Lab Sample: 1382165					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.051	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHKCL					
Lab Sample: 1382166					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	1.63	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					

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PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382167					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.49	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-3-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382168					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	6.11	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.60 ug					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-FHHNO3/FILT					
Lab Sample: 1382169					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.021	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHKCL					
Lab Sample: 1382170					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382171					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.17	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-OUT-BT-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382172					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = < 0.17 ug					

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INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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• AIHA ACCREDITATION NO. 100439 • PA DER 06-353

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-IN-1-OHM-26OCT1999-FHHNO3/FILT (W-1)					
Lab Sample: 1382173					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	0.089	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-IN-1-OHM-26OCT1999-BHKCL					
Lab Sample: 1382174					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	16.5	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-IN-1-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382175					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	0.89	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-1-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382176					
sampled: 27-OCT-99					
Hg by Ont. Hydro Method, Draft	5.86	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.75 ug					
SMEPA-U2 FGD-IN-2-OHM-26OCT1999-FHHNO3/FILT (W-3)					
Lab Sample: 1382177					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.025	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-IN-2-OHM-26OCT1999-BHKCL					
Lab Sample: 1382178					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	12.5	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					

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INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

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

Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-IN-2-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382179					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.83	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-2-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382180					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	5.33	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 6.16 ug					
SMEPA-U2 FGD-IN-3-OHM-26OCT1999-FHHNO3/FILT (W-2)					
Lab Sample: 1382181					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.031	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
SMEPA-U2 FGD-IN-3-OHM-26OCT1999-BHKCL					
Lab Sample: 1382182					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	10.8	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-IN-3-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382183					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	0.68	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-3-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382184					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	4.46	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 5.14 ug					

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• EPA/NVLAP 101262-0 • NY DOH 10903 • NJ DEP 77678
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Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-KCL					
Lab Sample: 1382185					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-FILT					
Lab Sample: 1382186					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-KMNO4					
Lab Sample: 1382187					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-HNO3/H2O2					
Lab Sample: 1382188					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.28	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-HNO3					
Lab Sample: 1382189					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.084	ug/sample	Ont Hydro	22-NOV-99	JLP
Total Particle Bound Mercury = Hg Ash (ug) + Hg in Probe Rinse (ug)					
Total Particle Bound Mercury = < 0.08 ug					
SMEPA-U2 FGD-IN-BT-OHM-26OCT1999-FHHNO3/FILT					
Lab Sample: 1382190					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.027	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					

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INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA/NVLAP 101262-0 • NY DOH 10903 • NJ DEP 77678
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Client: Roy F. Weston, Inc.
Project: 187900

	RESULT	UNITS	METHOD	DATE	ANALYST
SMEPA-U2 FGD-IN-BT-OHM-26OCT1999-BHKCL					
Lab Sample: 1382191					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.16	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
SMEPA-U2 FGD-IN-BT-OHM-26OCT1999-BHHNO3					
Lab Sample: 1382192					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.17	ug/sample	Ont Hydro	22-NOV-99	JLP
SMEPA-U2 FGD-IN-BT-OHM-26OCT1999-BHKMNO4					
Lab Sample: 1382193					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = < 0.17 ug					
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-Thimble					
Lab Sample: 1382194					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
SMEPA-U2 FGD-IN-SB-OHM-26OCT1999-10% HNO3					
Lab Sample: 1382195					
sampled: 28-OCT-99					
Hg by Ont. Hydro Method, Draft	< 0.06	ug/sample	Ont Hydro	22-NOV-99	JLP

< Indicates less than the limit of quantitation.

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187901-04
187900-01

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/22/99	Element: HG – Ontario Hydro Method
Analyst: [signature]	Time of Analysis: 0843
Data Validated by: V. Cyrell 12/2/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-28-9 to 14	11/21/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-28-17	11/21/99
IPC/CCV	360-28-16	11/21/99

- Mercury's Linear Dynamic Range (LDR) is 25ug/L.

- See 11/30/99 for analysis of the thimble/filters and Total Particle Bound Hg calculations.

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Jennifer L Pace 11/29/99
Signature of Analyst and Date

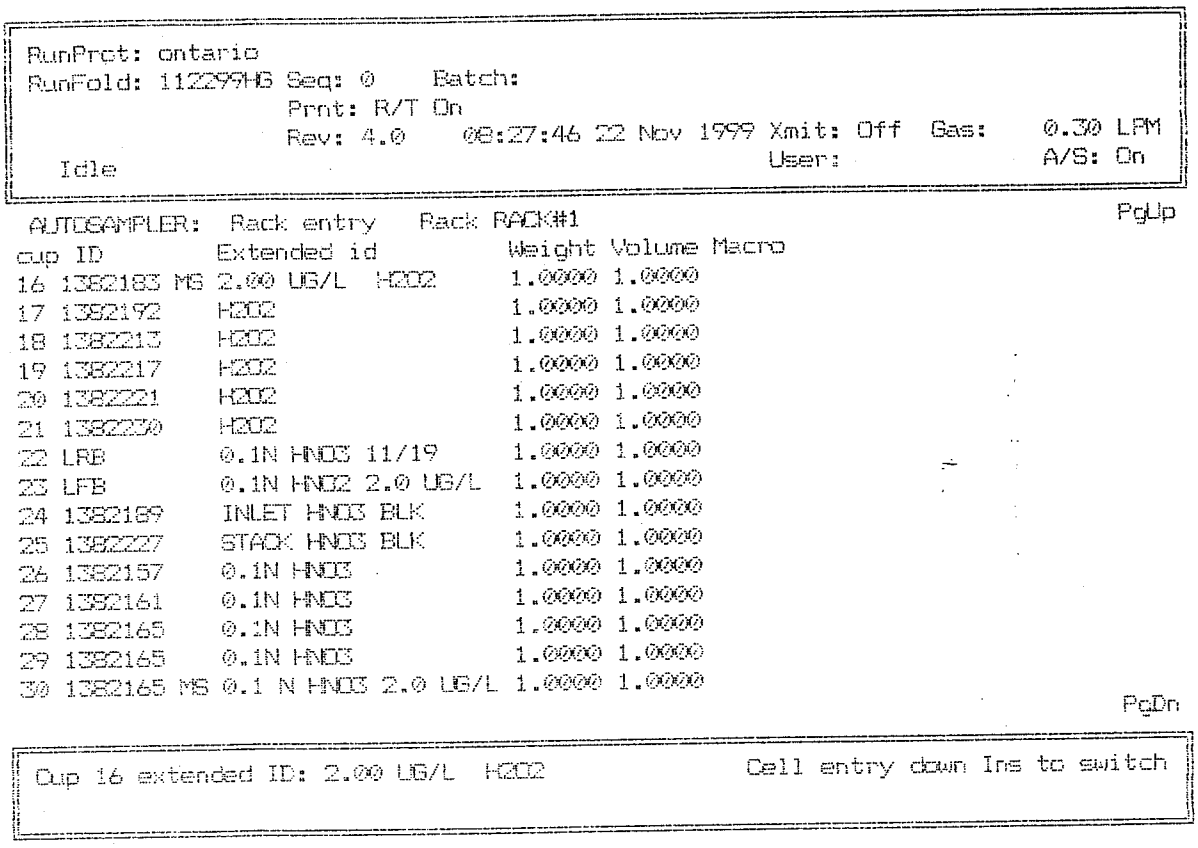
```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:27:45 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1

cup	ID	Extended id	Weight	Volume	Macro
1	QCS 11/22	5.00 UG/L ONTARIO	1.0000	1.0000	
2	1382195	INLET BLK 10% HNO3	1.0000	1.0000	
3	1382232	STACK BLK 10% HNO3	1.0000	1.0000	
4	LRB H2O2	11/19	1.0000	1.0000	
5	LFB H2O2	11/19 2.00 UG/L	1.0000	1.0000	
6	1382226	BLK STACK H2O2	1.0000	1.0000	
7	1382188	BLK INLET H2O2	1.0000	1.0000	
8	1382159	H2O2	1.0000	1.0000	
9	1382163	H2O2	1.0000	1.0000	
10	1382167	H2O2	1.0000	1.0000	
11	1382171	H2O2	1.0000	1.0000	
12	1382175	H2O2	1.0000	1.0000	
13	1382179	H2O2	1.0000	1.0000	
14	1382183	H2O2	1.0000	1.0000	
15	1382183	H2O2	1.0000	1.0000	

PgDn

```
Cup 1  extended ID: 5.00 UG/L ONTARIO          Cell entry down Ins to switch
```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RunFold: 112299H6 Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 08:27:46 22 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle
User: A/S: On
PgUp
AUTOSAMPLER: Rack entry Rack RACK#1
cup ID Extended id Weight Volume Macro
16 1382183 MS 2.00 UG/L H2O2 1.00000 1.00000
17 1382192 H2O2 1.00000 1.00000
18 1382213 H2O2 1.00000 1.00000
19 1382217 H2O2 1.00000 1.00000
20 1382221 H2O2 1.00000 1.00000
21 1382230 H2O2 1.00000 1.00000
22 LRB 0.1N HNO3 11/19 1.00000 1.00000
23 LFB 0.1N HNO2 2.0 UG/L 1.00000 1.00000
24 1382189 INLET HNO3 BLK 1.00000 1.00000
25 1382227 STACK HNO3 BLK 1.00000 1.00000
26 1382157 0.1N HNO3 1.00000 1.00000
27 1382161 0.1N HNO3 1.00000 1.00000
28 1382165 0.1N HNO3 1.00000 1.00000
29 1382165 0.1N HNO3 1.00000 1.00000
30 1382165 MS 0.1 N HNO3 2.0 UG/L 1.00000 1.00000
PgDn
Cup 16 extended ID: 2.00 UG/L H2O2
Cell entry down Ins to switch

```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:27:47 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

PgUp

AUTOSAMPLER: Rack entry Rack RACK#1

cup	ID	Extended id	Weight	Volume	Macro
31	1382169	0.1N HNO3	1.0000	1.0000	
32	1382173	0.1N HNO3	1.0000	1.0000	
33	1382177	0.1N HNO3	1.0000	1.0000	
34	1382181	0.1N HNO3	1.0000	1.0000	
35	1382190	0.1N HNO3	1.0000	1.0000	
36	1382211	0.1N HNO3	1.0000	1.0000	
37	1382215	0.1N HNO3	1.0000	1.0000	
38	1382219	0.1N HNO3	1.0000	1.0000	
39	1382228	0.1N HNO3	1.0000	1.0000	
40	LRB KCL	11/19	1.0000	1.0000	
41	LFB KCL	11/19 2.00 UG/L	1.0000	1.0000	
42	1382223	STACK BLK KCL	1.0000	1.0000	
43	1382223	STACK BLK KCL	1.0000	1.0000	
44	1382223 MS	2.00 UG/L	1.0000	1.0000	

PgDn

```
Cup 31 extended ID: 0.1N HNO3                    Cell entry down Ins to switch
```

```
RunProt: ontario
RunFold: 112299HB Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:33:35 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
                                                   User:          A/S: On
  Idle
```

AUTOSAMPLER: Rack entry Rack RACK#2

Cup	ID	Extended id	Weight	Volume	Macro
1	1382185	INLET BLK KCL	1.00000	1.00000	
2	1382158	KCL	1.00000	1.00000	
3	1382162	KCL	1.00000	1.00000	
4	1382166	KCL	1.00000	1.00000	
5	1382170	KCL	1.00000	1.00000	
6	1382174	KCL	1.00000	1.00000	
7	1382178	KCL	1.00000	1.00000	
8	1382182	KCL	1.00000	1.00000	
9	1382191	KCL	1.00000	1.00000	
10	1382212	KCL	1.00000	1.00000	
11	1382212	KCL	1.00000	1.00000	
12	1382212 MS	KCL 2.00 UG/L	1.00000	1.00000	
13	1382216	KCL	1.00000	1.00000	
14	1382220	KCL	1.00000	1.00000	
15	1382229	KCL	1.00000	1.00000	

PgDn

```
Cup 1  extended ID: INLET BLK KCL                Cell entry down Ins to switch
```

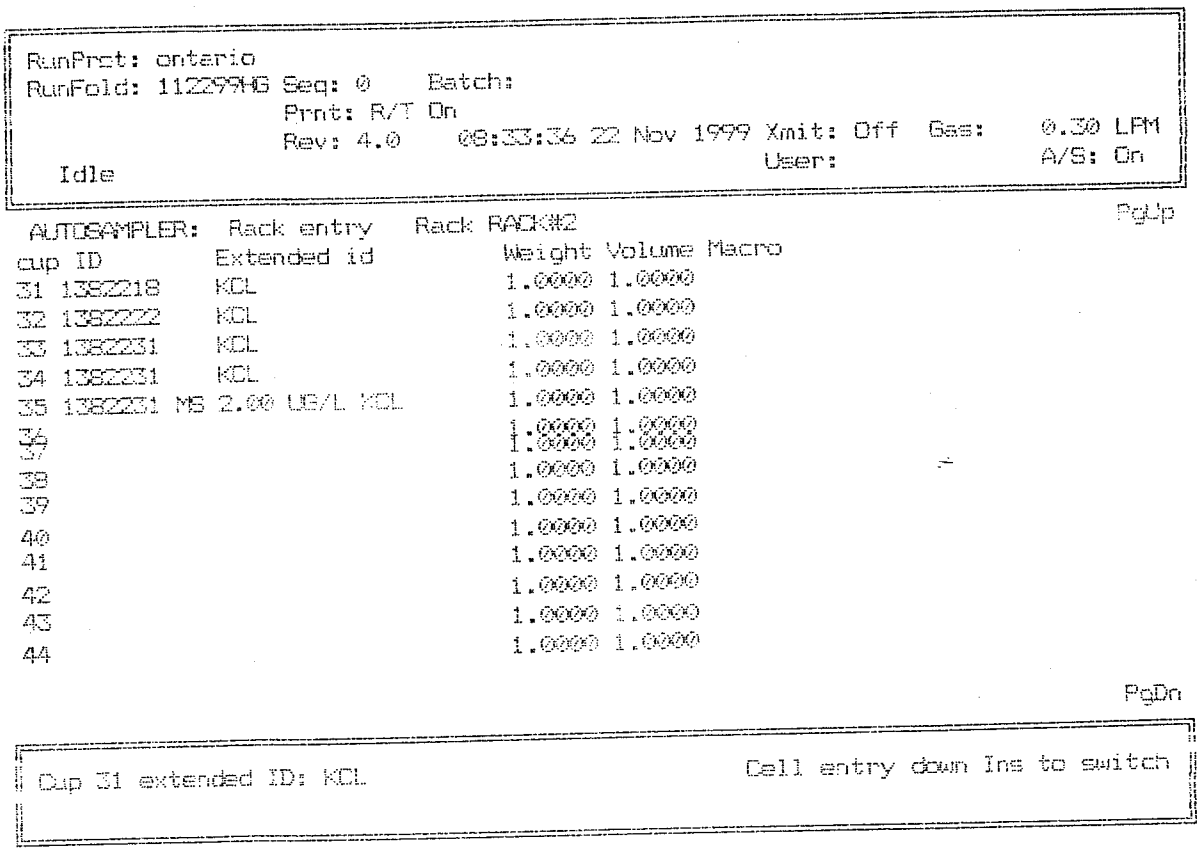
```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:33:35 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#2 PgUp

cup	ID	Extended id	Weight	Volume	Macro
16	LRB KMNO4	11/19	1.0000	1.0000	
17	LFB KMNO4	11/19 2.00 UG/L	1.0000	1.0000	
18	1382225	STACK BLK KCL	1.0000	1.0000	
19	1382187	INLET BLK KCL	1.0000	1.0000	
20	1382160	KCL	1.0000	1.0000	
21	1382164	KCL	1.0000	1.0000	
22	1382168	KCL	1.0000	1.0000	
23	1382172	KCL	1.0000	1.0000	
24	1382176	KCL	1.0000	1.0000	
25	1382176	KCL	1.0000	1.0000	
26	1382176 MS	KCL 2.00 UG/L	1.0000	1.0000	
27	1382180	KCL	1.0000	1.0000	
28	1382184	KCL	1.0000	1.0000	
29	1382193	KCL	1.0000	1.0000	
30	1382214	KCL	1.0000	1.0000	

PgDn

```
Cup 16 extended ID: 11/19                    Cell entry down Ins to switch
```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RunFold: 112299HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 08:33:36 22 Nov 1999 Xmit: Off Gas: 0.30 LPM
User: A/S: On
Idle
PgUp
AUTOSAMPLER: Rack entry Rack RACK#2
cup ID Extended id Weight Volume Macro
31 1382218 KCL 1.00000 1.00000
32 1382222 KCL 1.00000 1.00000
33 1382231 KCL 1.00000 1.00000
34 1382231 KCL 1.00000 1.00000
35 1382231 MS 2.00 UG/L KCL 1.00000 1.00000
36 1.00000 1.00000
37 1.00000 1.00000
38 1.00000 1.00000
39 1.00000 1.00000
40 1.00000 1.00000
41 1.00000 1.00000
42 1.00000 1.00000
43 1.00000 1.00000
44 1.00000 1.00000
PgDn
Cup 31 extended ID: KCL
Cell entry down Ins to switch

Book #118

Ontario Hydro Method (10/27/99 Draft)

Analyst, Date Time Started	Sample ID	Initial Sample Vol. Rec'd (L)	(L) Final volume (add portion and weight up to)	Total volume used for digestion (ml)	Volume conc. H_2SO_4 added (ml)	Volume conc. HNO_3 (ml)	Volume 5% $KMnO_4$ (ml)	Volume HCl (ml)	(ml) Volume 5% H_2SO_4	Vol. of 10% Hydroxylamine (ml)	Comments
11/1/99 0920	1382195 (nonreg) Inlet Blk	0.278	–	–	–	–	–	–	–	–	10 ml
	Stk. Blk. (nonreg) 1382232	0.155	–	–	–	–	–	–	–	–	
	LRB - H_2O_2	–	–	10 ml	0.5 ml	–	18 ml	0.5 ml	1.5 ml	4 ml	–
	LFB - H_2O_2 (Client Blk)	–	–			–	18 ml			5 ml	20 ml of 1.0 mg/l Hg added
	1382188	0.285 l	0.285 l ~~0.250 l~~ 0.250 l			–	40 ml			3 ml	SB
	1382159	0.130				–	18 ml				#1 out
	2163	0.132				–	18 ml				#2
	2167	0.152				–	18 ml				#3
	2171	0.146				–	18 ml				BT
	2175	0.146				–	18 ml				#1 Inlet
	2179	0.134				–	18 ml				#2
	2183	0.148				–	18 ml				#3
	2192	0.128				–	18 ml				BT
	2213	0.148				–	22 ml				#1 Stack
	2217	0.150				–	22 ml				#2
	2221	0.164				–	18 ml				#3
	2230 (Client Blk)	0.140				–	22 ml				BT
	2226	0.136				–	26 ml				Stk-SB
11/1/99 0920	LRB 0.1N HNO_3	–	–	30 ml	1.5 ml	0.75 ml	4.5 ml	Not added	2.4 ml	3.0 ml	–
	LFB 0.1N HNO_3 (Client Blk)	–	–								Attached of 1.0 mg/l Hg
	1382189 (Client Blk)	0.300 l	–								Inlet SB
	1382227	0.165 l ~~0.156 l~~	–								Stack SB
	1382157	0.270	–								#1 outlet
	1382161	0.173	–								#2
	1382165	0.180	–								#3
	1382169	0.103	–								BT
	1382173	0.045	–								#1 inlet
	1382177	0.090	–								#2
	1382181	0.112	–								#3
	1382190	0.095	–								BT
	1382211	0.053	–								#1 Stack
	1382215	0.085	–								#2
	1382219	0.065	–								#3
	1382228	0.087	–								BT
11/1/99 1300	LRB - KCL	–	–					–	2.25 ml	3.0	–
	LFB - KCL Client Blk	–	–					–			Initial Sample of 1.0 mg/l Hg Std
	1382223 Client Blk	0.260	0.500 l					–			Stack Blk
	2185	0.325	0.500 l					–			Inlet Blk
	2158	0.650	0.650 l					–			#1 outlet
	2162	0.690	0.690 l					–			#2

Book #118

Ontario Hydro Method (10/27/99 Draft)

187901

pg. #56

Analyst's Initials & Date	Sample ID	Initial sample vol (L)	Final vol (L) and sample weight up to	Total volume of sample aliquot (mL)	Vol of 1.5 mL Hexane (mL)	Vol of hexane aliquot (mL)	Vol of 5% KOH aliquot (mL)	Vol of rinse (KCl) (mL)	Vol of rinse of 5% KOH (mL)	Vol of rinse of 10% H_2SO_4 (mL)	
11/19/99 JHP 1st	1362166	0.750 L	0.750 L	30 mL	1.5 mL	0.75 mL	4.5 mL	—	2.25 mL	3.0 mL	
	2170	0.480 L	0.500 L								
	2174	0.950 L	0.950 L								
	2178	0.900 L	0.900 L								
	2182	0.840 L	0.840 L								
	2191	0.550 L	0.550 L								
	2202	0.695 L	0.695 L								
	2216	0.787 L	0.787 L								
	2220	0.800 L	0.800 L								
	2229	0.480 L	0.500 L								
11/22/99 JHP 2nd	LRB-KMnO4	—	—	30 mL	—	1.5 mL	4.5 mL	—	2.25 mL	3.0 mL	60 mL of 1.00 mg/L H_2O_2 added
	LFB-KMnO4	—	—		—		4.5 mL	—			
	1382235 client Blk	0.250 L	0.500 L		—		4.5 mL	—			
	1382167	0.350 L			—		4.5 mL	—			
	1382160	0.480 L			—		4.5 mL	—			
	2164	0.545 L	0.545 L		—		4.5 mL	—			
	2168	0.600 L	0.600 L		—		4.5 mL	—			
	2172	0.495 L	0.500 L		—		4.5 mL	—			
	2176	0.470 L			—		4.5 mL	—			
	2180	0.480 L			—		5.0 mL	—			
	2184	0.490 L			—		7.5 mL	—			
	2193	0.514 L	0.514		—		4.5 mL	—			
	2214	0.430 L	0.500		—		4.5 mL	—			
	2218	0.435 L	0.500 L		—		4.5 mL	—			
	2222	0.520 L	0.530 L		—		4.5 mL	—			
	2231	0.430 L	0.500 L		—		10.5 mL	—			

Kmno4 Aging Vessel day one (11/19/99)

Reagents, QC, Standards Preparation Log #360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents		Reagent SSM ID #		Final Volume		Dilution Matrix	Remarks
				#	Units		Conc.	#	Units		
1) 11/17/99 1122	SMW		1.00 ug/L Std	50	ul	360-28-21	1.00 mg/L	50	ml	2.5% HNO3 + 2.5% HCl	NIOSH 6009
2)			2.00	100							
3)			5.00	250							
4)			ICV/CCV 2.0 ug/L	100							
5)			ICV/CCS 3.0 ug/L	150		360-28-22					
6) 11/19/99 0732	GH	—	1.00 mg/L Hg stock std	100	ul	Hg-995118509	1000 mg/L Hg	100	ml	0.15% HNO3	For Ontario Hydro Spikes
7) 11/21/99 0745	GH	11/22/99	100 mg/L Hg stock std	100	ul	Hg-995118501	1000 mg/L Hg	100	ml		
8)			1.00 mg/L Hg QCS stock	100	ul	Hg-995123001	1000 mg/L Hg	100	ml		
9)			Cal Blk	—	—	—	—	100	ml	10% HCl matrix	For Ontario Hydro method
10)			0.20 ug/L Hg std	20	ul	360-29-7	1.00 mg/L Hg				
11)			0.50	50							
12)			2.00	200							
13)			5.00	500							
14)			10.0	1000							
15)			ICB/CCB For Hg	—	—	—	—				
16)			ICV/CCV 5.00 ug/L Hg	500	ul	360-29-7	1.00 mg/L Hg				
17)			CCS/ICV 5.00 ug/L Hg	500		360-29-8					
18)											
19)											
20)											
21)											
22)											
23)											
24)											
25)											

```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                 Prnt: R/T On
                 Rev: 4.0    08:05:42 22 Nov 1999 Xmit: Off  Gas:          LPM
  Idle                                            User:                A/S: On
```

INSTRUMENT: Scheduled Maintenance

	Uses left	Last service	Next service
replace: Pump tubing	461	17-Nov-99	27-Nov-99
Waste drain tubing	2132	12-Nov-99	27-Oct-00
Liquid/gas separator	1343	07-Sep-99	11-Oct-00
pump head	10000	N/A	N/A
Hg lamp	N/A	30-Aug-99	27-Jan-00
Reductant bottle	400	22-Nov-99	20-May-00
prOcess tubing	1343	N/A	N/A
Clean optical cell	600	N/A	N/A

* -- needs maintenance

```
RunProt: ontario
RunFold: 112299MG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:35:00 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                              User:             A/S: On

UTILITY:  Diagnostics  Tip X      0 1    0
Aper test              Tip Y      0 1    0
Test optic             Tip Z     95 1    0
Tip home               Gas      334
Out port
In port
Run pcode
Cal A/S
```

aperture 2
acceptable Range = -100 to +100

```
 Sensors on solenoid Enter for test Ins for motor More tests
 Pcode halt 0     @ 344
```

```
RunProt: ontario
RunFold: 112299MG Seq: 0     Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:35:14 22 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                               User:            A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1    0
Aper test              Tip Y      0 1    0
Test optic             Tip Z     95 1    0
Tip home               Gas      334
Out port                                    Smpl. intensity    1197337
In port                                     Ref. intensity     1201531
Run pcode
Cal A/S
```

3 1/10% differen. acceptable

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0     @ 142
```

Calculations from Ontario Hydro Method
October 27, 1999 Draft.

DRAFT

15. Calculations for Particle-Bound, Oxidized, Elemental, and Total Mercury Concentrations:

15.1 *Particle-Bound Mercury*

15.1.1 *Case 1: Amount of Ash on the Filter is Greater Than 0.5 g*—Calculate the concentration of mercury in µg/g in the ash sample (Hg_{ash}) using Equation 4:

$$Hg_{ash}, \mu g/g = (IR)(DF) \qquad \text{[Eq. 4]}$$

where:
IR = instrument reading, µg/L
DF = dilution factor = (total digested volume, L)/(mass of ash digested, g)

Calculate the amount of mercury in the probe rinse (Hg_{pr}, Container 2) in µg using Equation 5:

$$Hg_{pr}, \mu g = (IR)(V_1) \qquad \text{[Eq. 5]}$$

where:
IR = instrument reading, µg/L.
V_1 = total volume of probe rinse sample from which sample aliquot was taken, L

Equation 5 assumes no preparation steps are needed prior to analyzing the probe rinse for mercury using CVAA. Although not required, a persulfate digest can be done on the probe rinse sample as discussed in section 13.3.3. If the persulfate digest is done equation 5 becomes Hg_{pr}, µg = (IR)(V_1)(DF) where DF is the same as equation 9.

There is no filter blank subtraction when >0.5 g of ash are collected on the sample filter or thimble.

The total amount of particle-bound mercury (Hg_{tp}) is then determined using Equation 6:

$$Hg \text{ (particle)}, \mu g = (Hg_{ash})(W_{ash}) + Hg_{pr} \qquad \text{[Eq. 6]}$$

where:
W_{ash} = the total mass of ash on filter, g

The concentration of particle-bound mercury (µg/dscm) in the gas stream is then determined using Equation 7:

$$Hg^{tp}, \mu g/dscm = Hg \text{ (particle)}/V_{m(std)} \qquad \text{[Eq. 7]}$$

where:
$V_{m(std)}$ = is the total volume of dry gas sampled at standard (normal) conditions, dscm

15.1.2 *Case 2: Amount of Ash on the Filter is Less Than 0.5 g*—The calculation is the same as in Case 1 except the entire sample (ash and filter) is digested; therefore, DF in Equation 4 is defined only by the total digested volume. In addition a filter blank is subtracted as calculated in Equation 8.

$$Hg_{fb}, \mu g = (IR)(V_2) \quad \text{[Eq. 8]}$$

where:
IR = instrument reading, µg/L
V_2 = total volume of sample filter blank digest, L

Equation 7 for Case 2 then becomes: Hg (particle), µg = $(Hg_{ash})(W_{ash}) - Hg_{fb} + Hg_{pr}$

15.2 *Oxidized Mercury*

15.2.1 *KCl Solution (Impingers 1–3)*—Calculate the concentration of mercury in µg/L in the KCl impinger solutions using Equation 9:

$$Hg_{KCl}, \mu g/L = (IR)(DF) \quad \text{[Eq. 9]}$$

where:
IR = instrument reading, µg/L
DF = dilution factor, $\frac{V_D + V(H_2SO_4) + V(HNO_3) + V(KMnO_4) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$
V_D = total digested volume, 10 mL
$V(H_2SO_4)$ = volume of added concentrated H_2SO_4, 0.5 mL
$V(HNO_3)$ = volume of added concentrated HNO_3, 0.5 mL
$V(KMnO_4)$ = volume of added 5%$^{w}/_{v}$ $KMnO_4$, 1.5 mL
$V(K_2S_2O_8)$ = volume of added 5%$^{w}/_{v}$ $K_2S_2O_4$, 0.75 mL
$V(NH_2OH)$ = volume of added 10%$^{w}/_{v}$ hydroxylamine sulfate, 1.0 mL

The concentration of mercury in the KCl solution blank is calculated in the same way.

15.2.2 *Total Oxidized Mercury (Hg_O)*—is defined by method as the mercury measured in the KCl sample minus the mercury measured in the KCl solution blanks, as shown in Equation 10:

$$Hg_O, \mu g = (Hg_{KCl})(V_3) - (Hg_{Ob})(V_4) \quad \text{[Eq. 10]}$$

where:
Hg_{KCl} = Mercury concentration measured in KCl aliquot, µg/L
V_3 = Total volume of aqueous KCl from which sample aliquot was taken, L
Hg_{Ob} = Mercury concentration measured in KCl solution blank aliquot, µg/L
V_4 = Volume of aqueous KCl originally charged to the impingers, L

The concentration of Hg^{2+} (µg/dscm) in the gas stream is then determined using Equation 11:

$$Hg^{2+}, \mu g/dscm = Hg_O/V_{m(std)} \quad [Eq. 11]$$

where:
$V_{m(std)}$ is the total volume of dry gas sampled at standard conditions, dscm

15.3 *Elemental Mercury*

15.3.1 *HNO_3–H_2O_2 Solution (Impinger 4)*—Calculate the concentration of mercury in µg/L in the HNO_3–H_2O_2 impinger solution using Equation 12:

$$Hg_{H2O2}, \mu g/L = (IR)(DF) \quad [Eq. 12]$$

where:

IR = instrument reading, µg/L

DF = dilution factor, $\frac{V_D + V(HCl) + V(H_2SO_4) + V(KMnO_4) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$

V_D = total digested volume, 5 mL

$V(HCl)$ = volume of added concentrated HCl, 0.25 mL

$V(H_2SO_4)$ = volume of added concentrated H_2SO_4, 0.5 mL

$V(KMnO_4)$ = volume of added saturated $KMnO_4$, mL (volume need to turn sample to a purple color)

$V(K_2S_2O_8)$ = volume of added 5%$^W/_V$ $K_2S_2O_4$, 0.75 mL (if used)

$V(NH_2OH$ = volume of added 10%$^W/_V$ hydroxylamine sulfate, 1.0 mL

The concentration of mercury in the HNO_3–H_2O_2 solution blank is calculated in the same way.

15.3.2 *H_2SO_4–$KMnO_4$ Solution (Impingers 5–7)*—Calculate the concentration of mercury in µg/L in the H_2SO_4–$KMnO_4$ impinger solutions using Equation 13:

$$\text{Mercury}, \mu g/L = (IR)(DF) \quad [Eq. 13]$$

KmnO4

where:

DF = dilution factor, $\frac{V_D + V(HNO_3) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$

IR = instrument reading, µg/L

V_D = total digested volume, 5 mL

$V(HNO_3)$ = volume of added concentrated HNO_3, 0.5 mL

$V(K_2S_2O_8)$ = volume of added 5%$^W/_V$ $K_2S_2O_4$, 0.75 mL

The concentration of mercury in the H_2SO_4–$KMnO_4$ solution blank is calculated in the same way.

15.3.3 *Total Elemental Mercury (Hg_E)*—is defined by method as the mercury measured in the H_2SO_4–$KMnO_4$ impingers plus the mercury in the HNO_3–H_2O_2 impingers minus the solution blanks as shown in Equation 14:

$$Hg_E, \mu g = (Hg_{H2O2})(V_4) - (Hg_{Eb1})(V_5) + (Hg_{KMnO4})(V_6) - (H_{Eb2})(V_7) \qquad [Eq. 14]$$

where:

Hg_{H2O2} = Mercury concentration measured in HNO_3–H_2O_2 aliquot, µg/L
V_4 = Total volume of aqueous HNO_3–H_2O_2 from which sample aliquot was taken, L
V_5 = Volume of aqueous HNO_3–H_2O_2 originally charged to the impinger, L
Hg_{Eb1} = Mercury concentration measured in HNO_3–H_2O_2 solution blank aliquot, µg/L
Hg_{KMnO4} = Mercury concentration measured in H_2SO_4–$KMnO_4$ aliquot, µg/L
V_6 = Total volume of aqueous H_2SO_4–$KMnO_4$ from which sample aliquot was taken, L
V_7 = Volume of aqueous H_2SO_4–$KMnO_4$ originally charged to the impingers, L
Hg_{Eb2} = Mercury concentration measured in H_2SO_4–$KMnO_4$ solution blank aliquot, µg/L

The concentration of Hg^{2+} (µg/dscm) in the gas stream is then determined using Equation 15:

$$Hg^0, \mu g/dscm = Hg_E/V_{m(std)} \qquad [Eq. 15]$$

where:

$V_{m(std)}$ is the total volume of dry gas sampled at standard conditions, dscm

15.4 *Total Mercury*—Is defined by the method as the sum of the particulate bound mercury, oxidized mercury, and elemental mercury as shown in Equation 16:

$$Hg(total), \mu g/dscm = Hg^{tp} + Hg^{2+} + Hg^0 \qquad [Eq. 16]$$

16. Precision and Bias

16.1 *Precision*

16.1.1 Formal evaluation of the Ontario Hydro method was completed with dynamic spiking of Hg^0 and $HgCl_2$ into a flue gas stream.[9] The results are shown in Table 1. The relative standard deviation for gaseous elemental mercury and oxidized mercury was found to be less than 11% for mercury concentrations greater than 3 µg/Nm^3 and less than 34% for mercury concentrations less than 3 µg/Nm^3. In all cases, the laboratory bias for these tests based on a calculated correction factor was not statistically significant. These values were within the acceptable range, based on the criteria established in EPA Method 301 (% RSD less than 50%).

[9] EPRI. "Evaluation of Flue Gas Mercury Speciation Methods," EPRI TR-108988, Electric Power Research Institute, Palo Alto, CA, Dec. 1997.

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 1 Rep: 1				Seq: 0		08:37:59 22 Nov 1999 HG		
Hg	.000	ug/l	-859					
*** Standard: 1 Rep: 2				Seq: 1		08:40:08 22 Nov 1999 HG		
Hg	.000	ug/l	-1180					
*** Standard: 1 Rep: 1				Seq: 2		08:43:51 22 Nov 1999 HG		
Hg	.000	ug/l	-359					
*** Standard: 1 Rep: 2				Seq: 3		08:46:00 22 Nov 1999 HG		
Hg	.000	ug/l	-433					
*** Standard: 2 Rep: 1				Seq: 4		08:48:09 22 Nov 1999 HG		
Hg	.200	ug/l	18532					
*** Standard: 2 Rep: 2				Seq: 5		08:50:19 22 Nov 1999 HG		
Hg	.200	ug/l	18553					
*** Standard: 3 Rep: 1				Seq: 6		08:52:30 22 Nov 1999 HG		
Hg	.500	ug/l	46930					
*** Standard: 3 Rep: 2				Seq: 7		08:54:41 22 Nov 1999 HG		
Hg	.500	ug/l	46893					
*** Standard: 4 Rep: 1				Seq: 8		08:56:52 22 Nov 1999 HG		
Hg	2.00	ug/l	189376					
*** Standard: 4 Rep: 2				Seq: 9		08:59:06 22 Nov 1999 HG		
Hg	2.00	ug/l	189031					
*** Standard: 5 Rep: 1				Seq: 10		09:01:19 22 Nov 1999 HG		
Hg	5.00	ug/l	466212					
*** Standard: 5 Rep: 2				Seq: 11		09:03:39 22 Nov 1999 HG		
Hg	5.00	ug/l	466680					

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 6 Rep: 1				Seq: 12	09:05:59 22 Nov 1999 HG			
Hg	10.0	ug/l	906272					
*** Standard: 6 Rep: 2				Seq: 13	09:08:26 22 Nov 1999 HG			
Hg	10.0	ug/l	905490					

RunRoot: ontario

RunFold: 11Z299HG Seq: 14 Batch:

Prnt: R/T On

Rev: 4.0 09:09:40 22 Nov 1999 Xmit: Off Gas: 0.30 LPM

Idle User: A/S: On

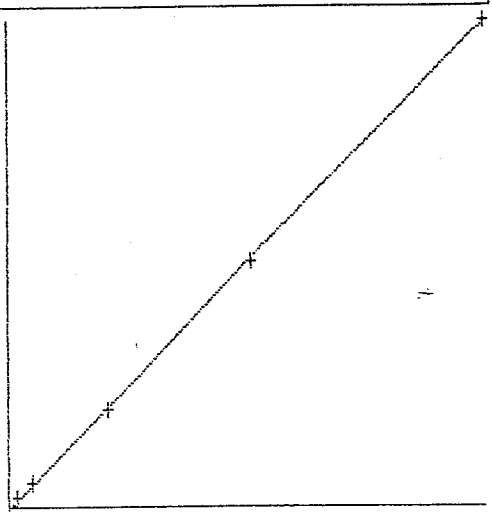
CALIBRATION: Line proto: ontario

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.039	-.039	Quadratic
S2	.200	.169	-.031	Utdlinear
S3	.500	.482	-.018	C
S4	2.00	2.05	.048	Accept o
S5	5.00	5.10	.101	n
S6	10.0	9.94	-.060	c

correlation coef.=

A .0000000 r .999877

B 1.10109e-5 C -3.58249e-2



Relative Absorbance

	Mean	%RSD		
S1	-396	-13.21	-359	-433
S2	18542	0.08	18532	18553
S3	46911	0.06	46930	46893
S4	189203	0.13	189376	189031
S5	466446	0.07	466212	466680
S6	985881	0.06	986272	985490

New cal coefficients stored

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 14 09:12:07 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.12 ✓	5.00	ug/l	.000

5.10 ug/l (102% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 15 09:14:29 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 16 09:16:46 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-45000	-.045	.000	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 17 09:18:52 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.040	.200	ug/l	.000

*** Sample ID: QCS 11/22 Seq: 18 09:20:58 22 Nov 1999 HG

5.00 UG/L ONTARIO

Hg	4.82	ug/l	.000	4.82	

$\bar{x}$ = (4.82 ug/l) (96% R)

*** Sample ID: QCS 11/22 Seq: 19 09:23:13 22 Nov 1999 HG

5.00 UG/L ONTARIO

Hg	4.83	ug/l	.000	4.83	

*** Sample ID: 1382195 Seq: 20 09:25:31 22 Nov 1999 HG

Volume Recd = 0.278 l

INLET BLK 10% HNO3

	<0.2				
Hg	-.047	ug/l	.000	-.047	

$\bar{x}$ = (<0.2 ug/l)(0.278 l) = (<0.06 ug)

*** Sample ID: 1382195 Seq: 21 09:27:35 22 Nov 1999 HG

INLET BLK 10% HNO3

	<0.2				
Hg	-.038	ug/l	.000	-.038	

*** Sample ID: 1382232 Volume Recd = 0.155 l Seq: 22 09:29:39 22 Nov 1999 HG

STACK BLK 10% HNO3

	<0.2				
Hg	-.040	ug/l	.000	-.040	

$\bar{x}$ = (<0.2 ug/l)(0.155 l) = (<0.04 ug)

*** Sample ID: 1382232 Seq: 23 09:31:43 22 Nov 1999 HG

STACK BLK 10% HNO3

	<0.2				
Hg	-.037	ug/l	.000	-.037	

*** Sample ID: LRB H202 Seq: 24 09:33:47 22 Nov 1999 HG

11/19

	<0.2				
Hg	.155	ug/l	.000	.155	

d.f. factor

$\bar{x}$ = (<0.2 ug/l) × (10 ml + 0.5 ml + 16 ml + 0.5 ml + 1.5 ml + 4 ml) / 10 ml = (<0.7 ug/l)

*** Sample ID: LRB H202 Seq: 25 09:35:51 22 Nov 1999 HG

11/19

	<0.2				
Hg	.147	ug/l	.000	.147	

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

*** Sample ID: LFB H202 T.V. = Seq: 26 09:37:56 22 Nov 1999 HG
11/19 2.00 UG/L
Hg .668 ug/l .000 .668

$\bar{x} = (0.666\ ug/l)\left(\frac{10ml+0.5ml+18ml+0.5ml+1.5ml+10ml}{10ml}\right)$
$= 2.36\ ug/l$ (118%R)

*** Sample ID: LFB H202 Seq: 27 09:40:02 22 Nov 1999 HG
11/19 2.00 UG/L
Hg .663 ug/l .000 .663

*** Check Standard: 4 Ck4IPC/CCV Seq: 28 09:42:07 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		103.	5.15 ✓	5.00	ug/l	.000

$\bar{x} = 5.11\ ug/l$ (102%R) 1% difference

*** Check Standard: 3 Ck3IPC/CCV Seq: 29 09:44:24 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.07 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 30 09:46:43 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-45400	-.045 ✓	.000	ug/l	.000

$\bar{x} = <0.2\ ug/l$

*** Check Standard: 1 Ck1ICB/CCB Seq: 31 09:48:50 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.040 ✓	.200	ug/l	.000

*** Sample ID: 1382226 Seq: 32 09:50:55 22 Nov 1999 HG
<0.2 BLK STACK H202
Hg .041 ug/l .000 .041

$\bar{x} = (<0.2 ug/l)\left(\frac{10ml+0.5+26+0.5+1.5+3ml}{10ml}\right)$
$= (<0.9 ug/l)(0.250l)$
$= <0.21 ug$

*** Sample ID: 1382226 Seq: 33 09:52:59 22 Nov 1999 HG
<0.2 BLK STACK H202
Hg .040 ug/l .000 .040

*** Sample ID: 1382188 Seq: 34 09:55:04 22 Nov 1999 HG
<0.2 BLK INLET H202
Hg -.017 ug/l .000 -.017

$\bar{x} = (<0.2 ug/l)\left(\frac{10ml+0.5ml+40ml+0.5ml+1.5ml+3}{10ml}\right)$
$= (<1.11 ug/l)(0.250l)$
$= <0.28 ug$

*** Sample ID: 1382188 Seq: 35 09:57:09 22 Nov 1999 HG
<0.2 BLK INLET H202
Hg -.015 ug/l .000 -.015

*** Sample ID: 1382159 Seq: 36 09:59:14 22 Nov 1999 HG
H202
Hg .550 ug/l .000 .550

$\bar{x} = (0.543 ug/l)\left(\frac{10ml+0.5+18+0.5+1.5+3}{10ml}\right)$ Dilution factor = 3.3
$= (1.82 ug/l)(0.250l)$ 3% difference
$= 0.455 ug$

*** Sample ID: 1382159 Seq: 37 10:01:21 22 Nov 1999 HG
H202
Hg .536 ug/l .000 .536

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

*** Sample ID: 1382163 Seq: 38 10:03:40 22 Nov 1999 HG

H202

Hg .686 ug/l .000 .686

$\bar{x}$ = (0.683 ug/l)(3.35) ← Dilution factor
= (2.29 ug/l)(0.250 l)
= 0.572 ug

*** Sample ID: 1382163 Seq: 39 10:05:50 22 Nov 1999 HG

H202

Hg .680 ug/l .000 .680

*** Sample ID: 1382167 Seq: 40 10:08:00 22 Nov 1999 HG

H202

Hg .580 ug/l .000 .580

$\bar{x}$ = (0.580 ug/l)(3.35) ← Dilution factor
= (1.94 ug/l)(0.250 l)
= 0.486 ug

*** Sample ID: 1382167 Seq: 41 10:10:08 22 Nov 1999 HG

H202

Hg .579 ug/l .000 .579

*** Check Standard: 4 Ck4IPC/CCV Seq: 42 10:12:15 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.10 ✓	5.00	ug/l	.000

$\bar{x}$ = 5.09 ug/l (102% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 43 10:14:35 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.08 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 44 10:16:52 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-43500	-.043 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 45 10:18:59 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.038 ✓	.200	ug/l	.000

*** Sample ID: 1382171 Seq: 46 10:21:05 22 Nov 1999 HG

<0.2

H202

Hg .062 ug/l .000 .062

$\bar{x}$ = (<0.2 ug/l)(3.35)
= (<0.67 ug/l)(0.250 l)
= <0.17 ug

*** Sample ID: 1382171 Seq: 47 10:23:10 22 Nov 1999 HG

<0.2

H202

Hg .061 ug/l .000 .061

*** Sample ID: 1382175 Seq: 48 10:25:15 22 Nov 1999 HG

H202

Hg 1.06 ug/l .000 1.06

$\bar{x}$ = (1.06 ug/l)(3.35)
= (3.55 ug/l)(0.250 l)
= 0.888 ug

*** Sample ID: 1382175 Seq: 49 10:27:29 22 Nov 1999 HG

H202

Hg 1.06 ug/l .000 1.06

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382179				Seq: 50	10:29:39 22 Nov 1999 HG			
			H2O2					
Hg	.991	ug/l	.000	.991				
*** Sample ID: 1382179				Seq: 51	10:31:54 22 Nov 1999 HG			
			H2O2					
Hg	1.00	ug/l	.000	1.00				
*** Sample ID: 1382183				Seq: 52	10:33:59 22 Nov 1999 HG			
			H2O2					
Hg	.817	ug/l	.000	.817				
*** Sample ID: 1382183				Seq: 53	10:36:12 22 Nov 1999 HG			
			H2O2					
Hg	.814	ug/l	.000	.814				
*** Sample ID: 1382183				Seq: 54	10:38:25 22 Nov 1999 HG			
			H2O2					
Hg	.810	ug/l	.000	.810				
*** Sample ID: 1382183				Seq: 55	10:40:39 22 Nov 1999 HG			
			H2O2					
Hg	.835	ug/l	.000	.835				

11/22/99 gp

*** Check Standard: 4 Ck4IPC/CCV Seq: 56 10:42:55 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09 ✓	5.00	ug/l	.000

*** Check Standard: 3 Ck3IPC/CCV Seq: 57 10:45:14 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.02 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 58 10:47:31 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-41900	-.042 ✓	.0000	ug/l	.000

*** Check Standard: 1 Ck1ICB/CCB Seq: 59 10:49:38 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.030 ✓	.200	ug/l	.000

*** Sample ID: 1382183 MS (matrix spk) Seq: 60 10:51:43 22 Nov 1999 HG

2.00 UG/L H2O2

Hg	2.62	ug/l	.000	2.62	

*** Sample ID: 1382183 MS (matrix spk) Seq: 61 10:54:07 22 Nov 1999 HG

2.00 UG/L H2O2

Hg	2.64	ug/l	.000	2.64	

required spike analysis

$\bar{x}$ = (0.996 ug/l)(3.35) = (3.33 ug/l)(0.250 l) = 0.834 ug

$\bar{x}$ = (0.814 ug/l)(3.35) = (2.73 ug/l)(0.250 l) = 0.683 ug

$\bar{x}$ = 5.05 ug/l (101 %R)

$\bar{x}$ = (0.2 ug/l

Spk T.V. = (2.00 ug/l)(3.35) = (6.7 ug/l)(0.25 l) = 1.68 ug

$\bar{x}$ = (2.63 ug/l)(3.35) = (8.81 ug/l)(0.25 l) = 2.20 ug (90 %R)

Folder: 112299HG
Protocol: ontario

10:56:25 22 Nov 1999

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

*** Sample ID: 1382192 Seq: 62 10:56:25 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.027	ug/l	.000	.027	

$\bar{x}$ = (<0.2 ug/l)(3.35)
= (<0.67 ug/l)(0.25 l)
= <0.17 ug

*** Sample ID: 1382192 Seq: 63 10:58:29 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.032	ug/l	.000	.032	

*** Sample ID: 1382213 Seq: 64 11:00:33 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.071	ug/l	.000	.071	

$\bar{x}$ = (<0.2 ug/l) × (10 ml + 0.5 ml + 22 ml + 0.5 ml + 1.5 ml + 3 ml) / 10 ml (dilution factor 3.35)
= (0.75 ug/l)(0.25 l)
= <0.19 ug

*** Sample ID: 1382213 Seq: 65 11:02:38 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.067	ug/l	.000	.067	

*** Sample ID: 1382217 Seq: 66 11:04:42 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.148	ug/l	.000	.148	

$\bar{x}$ = (<0.2 ug/l)(3.75)
= (<0.75 ug/l)(0.25 l)
= <0.19 ug

*** Sample ID: 1382217 Seq: 67 11:06:47 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.149	ug/l	.000	.149	

*** Sample ID: 1382221 Seq: 68 11:08:52 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.047	ug/l	.000	.047	

$\bar{x}$ = (<0.2 ug/l)(3.35)
= (<0.67 ug/l)(0.25 l)
= <0.17 ug

*** Sample ID: 1382221 Seq: 69 11:10:57 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.050	ug/l	.000	.050	

*** Check Standard: 4 Ck4IPC/CCV Seq: 70 11:13:04 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.6	4.98 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.98 ug/l (100%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 71 11:15:19 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.5	4.98 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 72 11:17:37 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-46400	-.046 ✓	.0000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 73 11:19:44 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.032 ✓	.200	ug/l	.000

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

*** Sample ID: 1382230 Seq: 74 11:21:50 22 Nov 1999 HG

	<0.2			H2O2				
Hg	.051	ug/l	.000	.051				

$\bar{x}$ = (<0.2 ug/l)(3.75) = (<0.75 ug/l)(0.25 l) = <0.19 ug

*** Sample ID: 1382230 Seq: 75 11:23:55 22 Nov 1999 HG

	<0.2			H2O2				
Hg	.048	ug/l	.000	.048				

*** Sample ID: LRB Seq: 76 11:26:01 22 Nov 1999 HG

	<0.2			0.1N HNO3 11/19				
Hg	-.022	ug/l	.000	-.022				

$\bar{x}$ = (<0.2 ug/l)(30 ml + 1.5 ml + 0.75 ml + 4.5 ml + 2.4 ml + 3.0 ml / 30 ml) = <0.28 ug/l

dilution factor (1.405)

*** Sample ID: LRB Seq: 77 11:28:06 22 Nov 1999 HG

	<0.2			0.1N HNO3 11/19				
Hg	-.045	ug/l	.000	-.045				

*** Sample ID: LFB T.V. = Seq: 78 11:30:11 22 Nov 1999 HG (Rechecked on pg. 565)

				0.1N HNO3 2.0 UG/L				
Hg	1.07	ug/l	.000	1.07				

$\bar{x}$ = (1.08 ug/l)(1.405) = 1.52 ug/l (76 %R)

*** Sample ID: LFB Seq: 79 11:32:26 22 Nov 1999 HG

				0.1N HNO3 2.0 UG/L				
Hg	1.08	ug/l	.000	1.08				

*** Sample ID: 1382189 Seq: 80 11:34:33 22 Nov 1999 HG

	<0.2			INLET HNO3 BLK				
Hg	-.016	ug/l	.000	-.016				

$\bar{x}$ = (<0.2 ug/l)(1.405) = (<0.28 ug/l)(0.300 l) = <0.084 ug

*** Sample ID: 1382189 Seq: 81 11:36:38 22 Nov 1999 HG

	<0.2			INLET HNO3 BLK				
Hg	-.018	ug/l	.000	-.018				

*** Sample ID: 1382227 Seq: 82 11:38:43 22 Nov 1999 HG

	<0.2			STACK HNO3 BLK				
Hg	-.023	ug/l	.000	-.023				

$\bar{x}$ = (<0.2 ug/l)(1.405) = (<0.28 ug/l)(0.165 l) = <0.046 ug

*** Sample ID: 1382227 Seq: 83 11:40:50 22 Nov 1999 HG

	<0.2			STACK HNO3 BLK				
Hg	-.022	ug/l	.000	-.022				

*** Check Standard: 4 Ck4IPC/CCV Seq: 84 11:42:56 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.4	4.92 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.93 ug/l (98 %R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 85 11:45:15 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.0	4.95 ✓	5.00	ug/l	.000

11:47:33 22 Nov 1999 Folder: 112299HG
Protocol: ontario

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

*** Check Standard: 2 Ck2ICB/CCB Seq: 86 11:47:33 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-37900	-.0038	.0000	ug/l	.0000

$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 87 11:49:39 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.0032	.2000	ug/l	.0000

*** Sample ID: 1382157 Outlet #1 Seq: 88 11:51:45 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	.051	ug/l	.0000	.051	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.270L)
= <0.076ug

*** Sample ID: 1382157 Seq: 89 11:53:50 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	.051	ug/l	.0000	.051	

*** Sample ID: 1382161 Outlet #2 Seq: 90 11:55:55 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	.036	ug/l	.0000	.036	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.173L)
= <0.048ug

*** Sample ID: 1382161 Seq: 91 11:58:01 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	.029	ug/l	.0000	.029	

required triplicate analysis

*** Sample ID: 1382165 Outlet #3 Seq: 92 12:00:08 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	-.009	ug/l	.0000	-.009	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.180L)
= <0.051ug

*** Sample ID: 1382165 Seq: 93 12:02:14 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	-.007	ug/l	.0000	-.007	

*** Sample ID: 1382165 Seq: 94 12:04:21 22 Nov 1999 HG

0.1N HNO3

	<0.2				
Hg	-.010	ug/l	.0000	-.010	

*** Sample ID: 1382165 Seq: 95 12:06:26 22 Nov 1999 HG

11/22/99 gtR 0.1N HNO3

	<0.2				
Hg	-.003	ug/l	.0000	-.003	

*** Sample ID: 1382165 MS matrix Spk Seq: 96 12:08:33 22 Nov 1999 HG

0.1 N HNO3 2.0 UG/L

Hg	1.73	ug/l	.0000	1.73	

Spk T.V. = (2.00ug/L)(1.405) = 2.81ug/L
= (2.81ug/L)(0.180L)
= 0.506ug

*** Sample ID: 1382165 MS matrix Spk Seq: 97 12:10:56 22 Nov 1999 HG

0.1 N HNO3 2.0 UG/L

Hg	1.71	ug/l	.0000	1.71	

$\bar{x}$ = (1.72ug/L)(1.405)
= (2.42ug/L)(0.180L)
= 0.435ug

86%R

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 98 12:13:11 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD $\bar{x}$ = 4.93ug/l (98%R)
Hg 98.5 4.93 ✓ 5.00 ug/l .000

*** Check Standard: 3 Ck3IPC/CCV Seq: 99 12:15:23 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.3 4.92 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 100 12:17:41 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD $\bar{x}$ = <0.2ug/l
Hg -42400 -.042 ✓ .000 ug/l .000

*** Check Standard: 1 Ck1ICB/CCB Seq: 101 12:19:49 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.036 ✓ .200 ug/l .000

*** Sample ID: 1382169 Outlet BT Seq: 102 12:21:55 22 Nov 1999 HG
0.1N HNO3 $\bar{x}$ = (<0.2ug/l)(1.405)
Hg .020 <0.2 ug/l .000 .020 = (<0.28ug/l)(0.103l)
= <0.021mg

*** Sample ID: 1382169 Seq: 103 12:24:01 22 Nov 1999 HG
0.1N HNO3
Hg .024 <0.2 ug/l .000 .024

*** Sample ID: 1382173 Inlet #1 Seq: 104 12:26:07 22 Nov 1999 HG
0.1N HNO3 $\bar{x}$ = (1.40ug/l)(1.405)
Hg 1.40 ug/l .000 1.40 = (1.97ug/l)(0.045l)
= 0.089mg

*** Sample ID: 1382173 Seq: 105 12:28:14 22 Nov 1999 HG
0.1N HNO3
Hg 1.39 ug/l .000 1.39

*** Sample ID: 1382177 Inlet #2 Seq: 106 12:30:21 22 Nov 1999 HG
0.1N HNO3 $\bar{x}$ = (<0.2ug/l)(1.405)
Hg .018 <0.2 ug/l .000 .018 = (<0.28ug/l)(0.090l)
= <0.025mg

*** Sample ID: 1382177 Seq: 107 12:32:27 22 Nov 1999 HG
0.1N HNO3
Hg .026 <0.2 ug/l .000 .026

*** Sample ID: 1382181 Inlet #3 Seq: 108 12:34:36 22 Nov 1999 HG
0.1N HNO3 $\bar{x}$ = (<0.2ug/l)(1.405)
Hg -.012 <0.2 ug/l .000 -.012 = (<0.28ug/l)(0.112l)
= <0.031mg

*** Sample ID: 1382181 Seq: 109 12:36:42 22 Nov 1999 HG
0.1N HNO3
Hg -.017 <0.2 ug/l .000 -.013

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

*** Sample ID: 1382190 Inlet BT Seq: 110 12:38:50 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	.062	ug/l	.000	.062	

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.095e) = (<0.027ug)

*** Sample ID: 1382190 Seq: 111 12:40:57 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	.060	ug/l	.000	.060	

*** Check Standard: 4 Ck4IPC/CCV Seq: 112 12:43:05 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.3	4.91 ✓	5.00	ug/l	.000

$\bar{x}$ = (4.91ugle) (98%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 113 12:45:23 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 114 12:47:38 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-46500	-.047 ✓	.000	ug/l	.000

$\bar{x}$ = (<0.2ugle)

*** Check Standard: 1 Ck1ICB/CCB Seq: 115 12:49:45 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.040 ✓	.200	ug/l	.000

*** Sample ID: 1382211 ~~Inlet~~ Stack #1 Seq: 116 12:51:52 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	-.006	ug/l	.000	-.006	

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.053e) = (<0.015ug)

*** Sample ID: 1382211 Seq: 117 12:53:58 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	-.007	ug/l	.000	-.007	

*** Sample ID: 1382215 Stack #2 Seq: 118 12:56:05 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	.002	ug/l	.000	.002	

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.085e) = (<0.024ug)

*** Sample ID: 1382215 Seq: 119 12:58:12 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	-.001	ug/l	.000	-.001	

*** Sample ID: 1382219 Stack #3 Seq: 120 13:00:18 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	.006	ug/l	.000	.006	

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.065e) = (<0.018ug)

*** Sample ID: 1382219 Seq: 121 13:02:26 22 Nov 1999 HG

				0.1N HNO3	
	<0.2				
Hg	.010	ug/l	.000	.010	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382228 Stock BT Seq: 122 13:04:33 22 Nov 1999 HG								
				0.1N HNO3				
Hg	<0.2 -.012	ug/l	.000	-.012				
*** Sample ID: 1382228 Seq: 123 13:06:39 22 Nov 1999 HG								
				0.1N HNO3				
Hg	<0.2 -.012	ug/l	.000	-.012				
*** Sample ID: LFB Recheck Seq: 124 13:09:24 22 Nov 1999 HG								
				0.1N HNO2 2.0 UG/L				
Hg	1.03	ug/l	.000	1.03				
*** Sample ID: LFB 11/22/99 GHP Seq: 125 13:11:43 22 Nov 1999 HG								
				0.1N HNO2 2.0 UG/L				
Hg	1.01	ug/l	.000	1.01				
*** Check Standard: 4 Ck4IPC/CCV Seq: 126 13:14:02 22 Nov 1999 HG								
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		97.8	4.89 ✓	5.00	ug/l	.000		
*** Check Standard: 3 Ck3IPC/CCV Seq: 127 13:16:19 22 Nov 1999 HG								
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		97.9	4.89 ✓	5.00	ug/l	.000		
*** Check Standard: 2 Ck2ICB/CCB Seq: 128 13:18:38 22 Nov 1999 HG								
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		-44700	-.045 ✓	.000	ug/l	.000		
*** Check Standard: 1 Ck1ICB/CCB Seq: 129 13:20:45 22 Nov 1999 HG								
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.037 ✓	.200	ug/l	.000			
*** Sample ID: LRB KCL Seq: 130 13:22:52 22 Nov 1999 HG								
				11/19				
Hg	<0.2 -.027	ug/l	.000	-.027				
*** Sample ID: LRB KCL Seq: 131 13:24:59 22 Nov 1999 HG								
				11/19				
Hg	<0.2 -.027	ug/l	.000	-.027				
*** Sample ID: LFB KCL T.V.= Seq: 132 13:27:07 22 Nov 1999 HG								
				11/19 2.00 UG/L				
Hg	1.23	ug/l	.000	1.23				
*** Sample ID: LFB KCL Seq: 133 13:29:19 22 Nov 1999 HG								
				11/19 2.00 UG/L				
Hg	1.23	ug/l	.000	1.23				

$\bar{x}$ = (<0.2 ug/L)(1.405)
= (<0.28 ug/L)(0.087 L)
= <0.024 ug

$\bar{x}$ = 4.89 ug/L (98 %R)

$\bar{x}$ = <0.2 ug/L

$\bar{x}$ = (<0.2 ug/L)(30 mL + 1.5 mL + 0.75 mL + 4.5 mL + 2.25 + 3 mL / 30 mL)
= <0.28 ug/L

Dilution factor (1.40)

$\bar{x}$ = (1.23 ug/L)(1.40)
= 1.72 ug/L (86 %R)

Folder: 112299HG
13:31:37 22 Nov 1999 Protocol: ontario

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

required replicate analysis.

*** Sample ID: 1382223 Seq: 134 13:31:37 22 Nov 1999 HG
STACK BLK KCL
Hg <0.2 -.029 ug/l .000 -.029

$\bar{x}$ = (<0.2 ug/l)(1.40) = (<0.28 ug/l)(0.500 L) = <0.14 ug

*** Sample ID: 1382223 Seq: 135 13:33:44 22 Nov 1999 HG
STACK BLK KCL
Hg <0.2 -.024 ug/l .000 -.024

*** Sample ID: 1382223 Seq: 136 13:35:51 22 Nov 1999 HG
STACK BLK KCL
Hg <0.2 -.023 ug/l .000 -.023

*** Sample ID: 1382223 Seq: 137 13:37:59 22 Nov 1999 HG
STACK BLK KCL
Hg <0.2 11/22/99 gpa -.022 ug/l .000 -.022

*** Sample ID: 1382223 MS Matrix Spike Seq: 138 13:40:06 22 Nov 1999 HG
2.00 UG/L
Hg 1.96 ug/l .000 1.96

Spk T.V. = (2.00 ug/l)(1.40) = (2.80 ug/l)(0.500 L) = 1.40 ug

$\bar{x}$ = (1.95 ug/l)(1.40) = (2.72 ug/l)(0.50 L) = 1.36 ug

97 %R

*** Sample ID: 1382223 MS Seq: 139 13:42:15 22 Nov 1999 HG
2.00 UG/L
Hg 1.93 ug/l .000 1.93

*** Check Standard: 4 Ck4IPC/CCV Seq: 140 13:44:22 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.02 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.96 ug/l

99 %R

*** Check Standard: 3 Ck3IPC/CCV Seq: 141 13:46:41 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.1	4.90 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 142 13:48:58 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-46500	-.047 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 143 13:51:05 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.037 ✓	.200	ug/l	.000

*** Sample ID: 1382185 Seq: 144 13:53:12 22 Nov 1999 HG
INLET BLK KCL
Hg <0.2 -.019 ug/l .000 -.019

$\bar{x}$ = (<0.2 ug/l)(1.40) = (<0.28 ug/l)(0.500 L) = <0.14 ug

*** Sample ID: 1382185 Seq: 145 13:55:21 22 Nov 1999 HG
INLET BLK KCL
Hg <0.2 -.019 ug/l .000 -.019

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

*** Sample ID: 1382158 Seq: 146 13:57:29 22 Nov 1999 HG
KCL
Hg 3.29 ug/l .000 3.29
$\bar{x}$ = (3.29 ug/l)(1.40)
= (4.61 ug/l)(0.650 l)
= 2.99 ug

*** Sample ID: 1382158 Seq: 147 13:59:41 22 Nov 1999 HG
KCL
Hg 3.28 ug/l .000 3.28

*** Sample ID: 1382162 Seq: 148 14:01:51 22 Nov 1999 HG
KCL
Hg 2.82 ug/l .000 2.82
$\bar{x}$ = (2.82 ug/l)(1.40)
= (3.95 ug/l)(0.690 l)
= 2.72 ug

*** Sample ID: 1382162 Seq: 149 14:04:04 22 Nov 1999 HG
KCL
Hg 2.82 ug/l .000 2.82

*** Sample ID: 1382166 Seq: 150 14:06:18 22 Nov 1999 HG
KCL
Hg 1.55 ug/l .000 1.55
$\bar{x}$ = (1.55 ug/l)(1.40)
= (2.17 ug/l)(0.750 l)
= 1.63 ug

*** Sample ID: 1382166 Seq: 151 14:08:27 22 Nov 1999 HG
KCL
Hg 1.54 ug/l .000 1.54

*** Sample ID: 1382170 Seq: 152 14:10:37 22 Nov 1999 HG
<0.2
KCL
Hg .005 ug/l .000 .005
$\bar{x}$ = (<0.2 ug/l)(1.40)
= (0.28 ug/l)(0.500 l)
= 1.14 ug <0.14 ug

*** Sample ID: 1382170 Seq: 153 14:12:46 22 Nov 1999 HG
<0.2
KCL
Hg .004 ug/l .000 .004

*** Check Standard: 4 Ck4IPC/CCV Seq: 154 14:14:53 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	4.94 ✓	5.00 ✓	ug/l	.000

$\bar{x}$ = 4.90 ug/l 98% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 155 14:17:08 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.2	4.86 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 156 14:19:31 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-39700	-.040 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 157 14:21:37 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.003 ✓	.200	ug/l	.000

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382174				Seq: 158	14:23:45 22 Nov 1999 HG			
			KCL		$\bar{x}$ = (12.4 ug/l)(1.40)			
Hg	12.4	ug/l	.000	12.4	= (17.4 ug/l)(0.950 l)			
					= (16.5 ug)			
*** Sample ID: 1382174				Seq: 159	14:26:10 22 Nov 1999 HG			
			KCL					
Hg	12.4	ug/l	.000	12.4				
*** Sample ID: 1382178				Seq: 160	14:28:36 22 Nov 1999 HG			
			KCL		$\bar{x}$ = (9.96 ug/l)(1.40)			
Hg	9.95	ug/l	.000	9.95	= (13.9 ug/l)(0.900 l)			
					= (12.5 ug)			
*** Sample ID: 1382178				Seq: 161	14:30:56 22 Nov 1999 HG			
			KCL					
Hg	9.97	ug/l	.000	9.97				
*** Sample ID: 1382182				Seq: 162	14:33:16 22 Nov 1999 HG			
			KCL		$\bar{x}$ = (9.18 ug/l)(1.40)			1% diffinance
Hg	9.13	ug/l	.000	9.13	= (13.9 ug/l)(0.840 l)			
					= (10.8 ug)			
*** Sample ID: 1382182				Seq: 163	14:35:40 22 Nov 1999 HG			
			KCL					
Hg	9.22	ug/l	.000	9.22				
*** Sample ID: 1382191				Seq: 164	14:38:00 22 Nov 1999 HG			
	<0.2		KCL		$\bar{x}$ = (<0.2 ug/l)(1.40)			
Hg	.069	ug/l	.000	.069	= (<0.28 ug/l)(0.550 l)			
					= (<0.16 ug)			
*** Sample ID: 1382191				Seq: 165	14:40:15 22 Nov 1999 HG			
	<0.2		KCL					
Hg	-.063	ug/l	.000	-.063				
*** Sample ID: 1382212				Seq: 166	14:43:30 22 Nov 1999 HG			
			KCL					
Hg	.755	ug/l 11/22/99 DMP	.000	.755				
*** Sample ID: 1382212				Seq: 167	14:45:40 22 Nov 1999 HG			
			KCL		$\bar{x}$ = (0.849 ug/l)(1.40)			
Hg	.842	ug/l	.000	.842	= (1.19 ug/l)(0.695 l)			
					= (0.826 ug)			

required replicate analysis see pg #569

*** Check Standard: 4 Ck4IPC/CCV Seq: 168 14:47:48 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.6	4.88 ✓	5.00	ug/l	.000

$\bar{x}$ = (4.85 ug/l) (97%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 169 14:50:06 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		96.6	4.83 ✓	5.00	ug/l	.000

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

*** Check Standard: 2 Ck2ICB/CCB Seq: 170 14:52:27 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -43900 -.044 .000 ug/l .000 $\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 171 14:54:34 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.038 .200 ug/l .0000

*** Sample ID: 1382212 Seq: 172 14:56:41 22 Nov 1999 HG
KCL
Hg .851 ug/l .000 .851

*** Sample ID: 1382212 Seq: 173 14:58:50 22 Nov 1999 HG
KCL
Hg .855 ug/l .000 .855

*** Sample ID: 1382212 MS Matrix Spk Seq: 174 15:01:00 22 Nov 1999 HG
KCL 2.00 UG/L
Hg 2.80 ug/l .000 2.80

Spk T.V. = (2.00 ug/L)(1.40) = (2.8 ug/L)(0.695 L) = 1.95 mg

$\bar{x}$ = (2.80 ug/L)(1.40) = (3.92 ug/L)(0.695 L) = 2.72 mg

97%R

*** Sample ID: 1382212 MS Matrix Spk Seq: 175 15:03:13 22 Nov 1999 HG
KCL 2.00 UG/L
Hg 2.80 ug/l .000 2.80

*** Sample ID: 1382216 Seq: 176 15:05:24 22 Nov 1999 HG
KCL
Hg .575 ug/l .000 .575

$\bar{x}$ = (0.577 ug/L)(1.40) = (0.808 ug/L)(0.787 L) = 0.636 mg

*** Sample ID: 1382216 Seq: 177 15:07:34 22 Nov 1999 HG
KCL
Hg .580 ug/l .000 .580

*** Sample ID: 1382220 Seq: 178 15:09:43 22 Nov 1999 HG
KCL
Hg .237 ug/l .000 .237

$\bar{x}$ = (0.240 ug/L)(1.40) = (0.336 ug/L)(0.800 L) = 0.269 mg

*** Sample ID: 1382220 Seq: 179 15:11:53 22 Nov 1999 HG
KCL
Hg .242 ug/l .000 .242

*** Sample ID: 1382229 Seq: 180 15:14:03 22 Nov 1999 HG
<0.2
KCL
Hg .027 ug/l .000 .027

$\bar{x}$ = (<0.2 ug/L)(1.40) = (<0.28 ug/L)(0.500 L) = <0.14 mg

*** Sample ID: 1382229 Seq: 181 15:16:13 22 Nov 1999 HG
<0.2
KCL
Hg .036 ug/l .000 .036

paired replicate analysis.

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 182 15:18:21 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.7 4.94 5.00 ug/l .000

*** Check Standard: 3 Ck3IPC/CCV Seq: 183 15:20:39 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 92.3 4.62 5.00 ug/l .000
(volume low in cup)

*** Check Standard: 4 Ck4IPC/CCV Seq: 184 15:24:18 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 95.7 4.79 5.00 ug/l .000
96% R
$\bar{x}$ = 4.78 ug/l
Refilled

*** Check Standard: 3 Ck3IPC/CCV Seq: 185 15:26:35 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 95.4 4.77 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 186 15:28:54 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -44500 -.044 .000 ug/l .000
$\bar{x}$ = < 0.2 ug

*** Check Standard: 1 Ck1ICB/CCB Seq: 187 15:31:00 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.041 .200 ug/l .000

*** Sample ID: LRB KMNO4 Seq: 188 15:33:09 22 Nov 1999 HG
< 0.2 11/19
Hg .017 ug/l .000 .017
Dilution factor (1.375)
$\bar{x}$ = (< 0.2 ug/l)(30 ml + 1.5 ml + 4.5 ml + 2.25 ml + 3.0 ml / 30 ml)
= < 0.28 ug/l

*** Sample ID: LRB KMNO4 Seq: 189 15:35:19 22 Nov 1999 HG
< 0.2 11/19
Hg .016 ug/l .000 .016

*** Sample ID: LFB KMNO4 T.V.= Seq: 190 15:37:29 22 Nov 1999 HG
11/19 2.00 UG/L
Hg 1.34 ug/l .000 1.34
$\bar{x}$ = (1.35 ug/l)(30 ml + 1.5 ml + 4.5 ml + 2.25 ml + 3.0 ml / 30 ml)
= 1.86 ug/l
93% R

*** Sample ID: LFB KMNO4 Seq: 191 15:39:49 22 Nov 1999 HG
11/19 2.00 UG/L
Hg 1.35 ug/l .000 1.35

*** Sample ID: 1382225 Seq: 192 15:42:01 22 Nov 1999 HG
< 0.2 STACK BLK ~~HCl~~ 2% Kmno4
Hg .021 ug/l .000 .021
$\bar{x}$ = (< 0.2 ug/l)(1.375)
= (< 0.28 ug/l)(0.50 l)
= < 0.14 ug

*** Sample ID: 1382225 Seq: 193 15:44:11 22 Nov 1999 HG
< 0.2 STACK BLK ~~HCl~~ 5% Kmno4
Hg .024 ug/l .000 .024

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

*** Sample ID: 1382187 Seq: 194 15:46:22 22 Nov 1999 HG

INLET BLK ~~KCL~~ gp 11/22 KMnO4

<0.2

Hg .016 ug/l .000 .016

$\bar{X}$ = (<0.2 ug/l)(1.375)
= (<0.28 ug/l)(0.50 l)
= <0.14 ug

*** Sample ID: 1382187 Seq: 195 15:48:32 22 Nov 1999 HG

INLET BLK ~~KCL~~ 11/22 gp KMnO4

<0.2

Hg .015 ug/l .000 .015

*** Sample ID: 1382160 Seq: 196 15:50:43 22 Nov 1999 HG

gp ~~KCL~~ KMnO4

Hg 9.82 ug/l .000 9.82

$\bar{X}$ = (9.87 ug/l)(1.375)
= (13.6 ug/l)(0.50 l)
= 6.79 ug

*** Sample ID: 1382160 Seq: 197 15:53:17 22 Nov 1999 HG

gp ~~KCL~~ KMnO4

Hg 9.92 ug/l .000 9.92

*** Check Standard: 4 Ck4IPC/CCV Seq: 198 15:55:58 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		96.2	4.81 ✓	5.00	ug/l	.000

$\bar{X}$ = 4.79 ug/l 96%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 199 15:58:17 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		95.7	4.78 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 200 16:00:36 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-44200	-.044 ✓	.000	ug/l	.000

$\bar{X}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 201 16:02:43 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.038 ✓	.200	ug/l	.000

*** Sample ID: 1382164 Seq: 202 16:04:51 22 Nov 1999 HG

11/22 gp ~~KCL~~ KMnO4

Hg 8.37 ug/l .000 8.37

$\bar{X}$ = (8.39 ug/l)(1.375)
= (11.5 ug/l)(0.545 l)
= 6.27 ug

*** Sample ID: 1382164 Seq: 203 16:07:21 22 Nov 1999 HG

gp ~~KCL~~ KMnO4

Hg 8.41 ug/l .000 8.41

*** Sample ID: 1382168 Seq: 204 16:09:54 22 Nov 1999 HG

gp ~~KCL~~ KMnO4

Hg 7.45 ug/l .000 7.45

$\bar{X}$ = (7.41 ug/l)(1.375)
= (10.2 ug/l)(0.600 l)
= 6.11 ug

*** Sample ID: 1382168 Seq: 205 16:12:26 22 Nov 1999 HG

gp ~~KCL~~ KMnO4

Hg 7.38 ug/l .000 7.38

Folder: 112299HG
16:15:01 22 Nov 1999 Protocol: ontario

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

*** Sample ID: 1382172 Seq: 206 16:15:01 22 Nov 1999 HG
gp ~~HCL~~ Kmno4
Hg <0.2 .032 ug/l .0000 .032

$\bar{x}$ = (<0.2ug/l)(1.375)
= ((0.275ug/l)(0.50l)
= <0.14ug

*** Sample ID: 1382172 Seq: 207 16:17:12 22 Nov 1999 HG
gp ~~HCL~~ Kmno4
Hg <0.2 .039 ug/l .0000 .039

required replicate replicates

*** Sample ID: 1382176 Seq: 208 16:19:23 22 Nov 1999 HG
gp ~~HCL~~ Kmno4
Hg 8.51 ug/l .0000 8.51

$\bar{x}$ = (8.50ug/l)(1.375)
= (11.7ug/l)(0.50l)
= 5.86ug

*** Sample ID: 1382176 Seq: 209 16:21:55 22 Nov 1999 HG
gp ~~HCL~~ Kmno4
Hg 8.54 ug/l .0000 8.54

*** Sample ID: 1382176 Seq: 210 16:24:30 22 Nov 1999 HG
gp ~~HCL~~ Kmno4
Hg 8.46 ug/l .0000 8.46

*** Sample ID: 1382176 Seq: 211 16:27:03 22 Nov 1999 HG
11/22/99 gp
gp ~~HCL~~ Kmno4
Hg 8.55 ug/l .0000 8.55

*** Check Standard: 4 Ck4IPC/CCV Seq: 212 16:29:33 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		94.3	4.71 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.69ug/l 94%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 213 16:31:51 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		93.6	4.68 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 214 16:34:03 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-4970@	-.050 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 215 16:36:09 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.040 ✓	.200	ug/l	.000

*** Sample ID: 1382176 MS Seq: 216 16:38:18 22 Nov 1999 HG
Kmno4
gp ~~HCL~~ 2.00 UG/L
Hg 10.1 ug/l .0000 10.1
11/22/99 gp See pg. # 525 for reprep.

*** Sample ID: 1382176 MS Seq: 217 16:40:53 22 Nov 1999 HG
Kmno4
gp ~~HCL~~ 2.00 UG/L
Hg 10.0 ug/l .000 10.0

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382180				Seq: 218	16:43:27 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy	$\bar{x}$ = (7.67ug/l)(30ml+1.5ml+5.0ml+2.25ml+3ml / 30ml)			
Hg	7.70	ug/l	.000	7.70	= (10.7ug/l)(0.500l)			
					= (5.33ug)			
*** Sample ID: 1382180				Seq: 219	16:45:59 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy				
Hg	7.65	ug/l	.000	7.65				
*** Sample ID: 1382184				Seq: 220	16:48:34 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy	$\bar{x}$ = (6.05ug/l)(30ml+1.5ml+~~5.0ml~~ 7.5ml+2.25+3ml / 30ml)			
Hg	6.09	ug/l	.000	6.09	= (8.92ug/l)(0.500l)			
					= (4.46ug)			
*** Sample ID: 1382184				Seq: 221	16:51:06 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy				
Hg	6.03	ug/l	.000	6.03				
*** Sample ID: 1382193				Seq: 222	16:53:40 22 Nov 1999 HG			
	<0.2			~~gp HCL~~ Kmnoy	$\bar{x}$ = (<0.2ug/l)(1.375)			
Hg	.020	ug/l	.000	.020	= (<0.28ug/l)(0.514l)			
					= (<0.14ug)			
*** Sample ID: 1382193				Seq: 223	16:55:52 22 Nov 1999 HG			
	<0.2			~~gp HCL~~ Kmnoy				
Hg	.031	ug/l	.000	.031				
*** Sample ID: 1382214				Seq: 224	16:58:03 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy	$\bar{x}$ = (11.0ug/l)(1.375)			
Hg	11.1	ug/l	.000	11.1	= (15.1ug/l)(0.50l)			
					= (7.56ug)			
*** Sample ID: 1382214				Seq: 225	17:00:38 22 Nov 1999 HG			
				~~gp HCL~~ Kmnoy				
Hg	10.9	ug/l	.000	10.9				

*** Check Standard: 4 Ck4IPC/CCV	Seq: 226	17:03:18 22 Nov 1999 HG			
Line Flag %Rcv. Found True Units	SD/RSD	$\bar{x}$ = (4.72ug/l) (94%R)			
Hg 94.8 4.74 ✓ 5.00 ug/l	.000				

*** Check Standard: 3 Ck3IPC/CCV	Seq: 227	17:05:38 22 Nov 1999 HG			
Line Flag %Rcv. Found True Units	SD/RSD				
Hg 94.3 4.71 ✓ 5.00 ug/l	.000				

*** Check Standard: 2 Ck2ICB/CCB	Seq: 228	17:08:00 22 Nov 1999 HG			
Line Flag %Rcv. Found True Units	SD/RSD	$\bar{x}$ = (<0.2ug/l)			
Hg -45800 -.046 ✓ .000 ug/l	.000				

*** Check Standard: 1 Ck1ICB/CCB	Seq: 229	17:10:06 22 Nov 1999 HG
Line Flag Found Range(+/-) Units	SD/RSD	
Hg -.040 ✓ .200 ug/l	.000	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382218					Seq: 230	17:12:15 22 Nov 1999 HG		
				gp ~~HCl~~ Kmno4				
Hg	10.9	ug/l	.000	10.9				
*** Sample ID: 1382218					Seq: 231	17:14:54 22 Nov 1999 HG		
				gp ~~HCl~~ Kmno4				
Hg	10.7	ug/l	.000	10.7				
*** Sample ID: 1382222					Seq: 232	17:17:33 22 Nov 1999 HG		
				gp ~~HCl~~ Kmno4				
Hg	10.3	ug/l	.000	10.3				
*** Sample ID: 1382222					Seq: 233	17:20:06 22 Nov 1999 HG		
				gp ~~HCl~~ Kmno4				
Hg	10.3	ug/l	.000	10.3				
*** Sample ID: 1382231					Seq: 234	17:22:41 22 Nov 1999 HG		
	<0.2			gp ~~HCl~~ Kmno4				
Hg	.009	ug/l	.000	.009				
*** Sample ID: 1382231					Seq: 235	17:24:54 22 Nov 1999 HG		
	<0.2			gp ~~HCl~~ Kmno4				
Hg	.023	ug/l	.000	.023				
*** Sample ID: 1382231					Seq: 236	17:27:10 22 Nov 1999 HG		
	<0.2			gp ~~HCl~~ Kmno4				
Hg	.021	ug/l	.000	.021				
*** Sample ID: 1382231					Seq: 237	17:29:23 22 Nov 1999 HG		
	11/22/99 gp			gp ~~HCl~~ Kmno4				
Hg	.023	ug/l	.000	.023				
*** Sample ID: 1382231 MS				Matrix Spk	Seq: 238	17:31:35 22 Nov 1999 HG		
				2.00 UG/L ~~HCl~~ Kmno4				
Hg	1.70	ug/l	.000	1.70				
*** Sample ID: 1382231 MS				2.00 UG/L ~~HCl~~ Kmno4	Seq: 239	17:33:59 22 Nov 1999 HG		
Hg	1.68	ug/l	.000	1.68				
*** Sample ID: 1382176 MS				Kmno4 Recheck	Seq: 240	17:37:06 22 Nov 1999 HG		
				~~HCl~~ 2.00 UG/L				
Hg	10.1	ug/l	.000	10.1				
*** Sample ID: 1382176 MS				Kmno4	Seq: 241	17:39:47 22 Nov 1999 HG		
				~~HCl~~ 2.00 UG/L				
Hg	10.3	ug/l	.000	10.3				

11/22/99 gp

required triplicate analysis

$\bar{X}$ = (10.8 ug/l)(1.375) = (14.9 ug/l)(0.50 l) = 7.42 ug

$\bar{X}$ = (10.3 ug/l)(1.375) = (14.2 ug/l)(0.530 l) = 7.51 ug

$\bar{X}$ = (<0.2 ug/l)(30 ml + 1.5 ml + 10.5 ml + 2.25 ml + 3 ml / 30 ml) = (<0.32 ug/l)(0.50 l) = <0.16 ug

Spk T.V. = (2.00 ug/l)(1.575) = (3.15 ug/l)(0.50 l) = 1.57 ug

$\bar{X}$ = (1.69 ug/l)(1.575) = (2.66 ug/l)(0.50 l) = 1.33 ug

85%R

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

*** Sample ID: 1382176 MS Reprep. Kmnoy Matrix Spk Seq: 242 17:42:24 22 Nov 1999 HG
~~KEL~~ 2.00 UG/L
Spk T.V. = (2.00 ug/l)(1.375) = (2.75 ug/l)(0.50 l) = 1.375 ug

Line	Conc.	Units	SD/RSD	1	2	3	4	5
Hg	10.7	ug/l	.000	10.7				

$\bar{x}$ = (10.6 ug/l)(1.375) = (14.57 ug/l)(0.50 l) = 7.29 ug

104 %R

*** Sample ID: 1382176 MS Kmnoy Seq: 243 17:45:04 22 Nov 1999 HG
~~KEL~~ 2.00 UG/L

Line	Conc.	Units	SD/RSD	1	2	3	4	5
Hg	10.5	ug/l	.000	10.5				

*** Check Standard: 4 Ck4IPC/CCV Seq: 244 17:47:40 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		93.6	4.68	5.00	ug/l	.000

$\bar{x}$ = 4.69 ug/l

94%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 245 17:49:55 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		93.9	4.69	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 246 17:52:18 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-57500	-.057	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 247 17:54:24 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ug/l	.000

Total Elemental Mercury (Hg_E) Calculations

Total elemental mercury is the Hg present in the H_2SO_4 - $KMnO_4$ impingers and the mercury present in the HNO_3 - H_2O_2 impingers solutions. See Method, equation #14, for calculations:

① # 1382160 : 1382159 (outlet #1)

6.79 ug $Hg_{(KMnO_4)}$ + 0.455 ug $Hg_{H_2O_2}$

= (7.25 ug Hg_E)

② # 1382164 + 1382163 (outlet #2)

6.27 ug $Hg_{(KMnO_4)}$ + 0.572 ug $Hg_{(H_2O_2)}$

= (6.84 ug Hg_E)

③ # 1382168 + 1382167 (outlet #3)

6.11 ug $Hg_{(KMnO_4)}$ + 0.486 ug $Hg_{(H_2O_2)}$

= (6.60 ug Hg_E)

④ 1382172 + 1382171 (outlet BT)

< 0.14 ug $Hg_{(KMnO_4)}$ + < 0.17 ug $Hg_{H_2O_2}$

= (< 0.17 ug Hg_E)

⑤ 1382176 + 1382175 (Inlet #1)

5.86 ug $Hg_{(KMnO_4)}$ + 0.888 ug $Hg_{H_2O_2}$

= (6.75 ug Hg_E)

⑥ 1382180 + 1382179 (Inlet #2)

5.33 ug $Hg_{(KMnO_4)}$ + 0.834 ug $Hg_{H_2O_2}$

= (6.16 ug Hg_E)

⑦ 1382184 + 1382183 (Inlet #3)

4.46 ug $Hg_{(KMnO_4)}$ + 0.683 ug $Hg_{H_2O_2}$

= (5.14 ug Hg_E)

Elemental Hg (cont'd)

(8) 1382193 + 1382192 (Inlet BT)

<0.14 ug Hg(kmno4) + <0.17 ug Hg H_2O_2

= <0.17 ug HgE

(9) 1382214 + 1382213 (#1 STK)

7.56 ug Hg(kmno4) + <0.19 ug Hg H_2O_2

= 7.56 ug HgE

(10) 1382218 + 1382217 (#2 STK)

7.42 ug Hg(kmno4) + <0.19 ug Hg H_2O_2

= 7.42 ug HgE

(11) 1382222 + 1382221 (#3 STK)

7.51 ug Hg(kmno4) + <0.17 ug Hg H_2O_2

= 7.51 ug HgE

(12) 1382231 + 1382230 (BT-STK)

<0.16 ug Hg(kmno4) + <0.19 ug Hg H_2O_2

= <0.19 ug HgE

187900-04
187901-04
188322-04
188323-04

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/30/99	Element: HG - Ontario Hydro method
Analyst: JAP	Time of Analysis: 1015
Data Validated by: V. O'Neil 12/2/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-30-5 to 10	11/29/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-30-12	11/29/99
IPC/CCV	360-30-11	11/29/99

- All samples analyzed in this set were either thimble portions or filters. The samples were digested as Ontario Hydro method (10/27/99 Draft) States. The final volume was brought up to 0.100 l.
- Calculations: $\mu g/l_{Hg} \times 0.100\,l_{final\ vol.m} = \mu g$ Hg present in sample

D.L. = 0.02 ug

- The Linear Dynamic Range for Hg is 25.0 ug/l.

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Jennifer L. Paris 12/1/99
Signature of Analyst and Date

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:36:36 30 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                             User:               A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1 Range 1-44 Clear seQ Undo eXit

cup	ID	Extended id	Weight	Volume	Macro
1	QCS	11/29 5.00UG/L	1.0000	1.0000	
2	LRB-ASH	11/29 DIH2O	1.0000	1.0000	
3	LFB-ASH	11/29 DIH2O	1.0000	1.0000	
4	NIST	COAL FLY ASH #1633B	1.0000	1.0000	
5	1382194	INLET SB	1.0000	1.0000	
6	1382186	INLET SB	1.0000	1.0000	
7	1382224	STACK SB	1.0000	1.0000	
8	1382157	OUTLET #1	1.0000	1.0000	
9	1382161	OUTLET #2	1.0000	1.0000	
10	1382165	OUTLET #3	1.0000	1.0000	
11	1382169	OUTLET BT	1.0000	1.0000	
12	1382173	INLET #1	1.0000	1.0000	
13	1382177	INLET #2	1.0000	1.0000	
14	1382177	INLET #2	1.0000	1.0000	
15	1382177 MS	INLET #2	1.0000	1.0000	

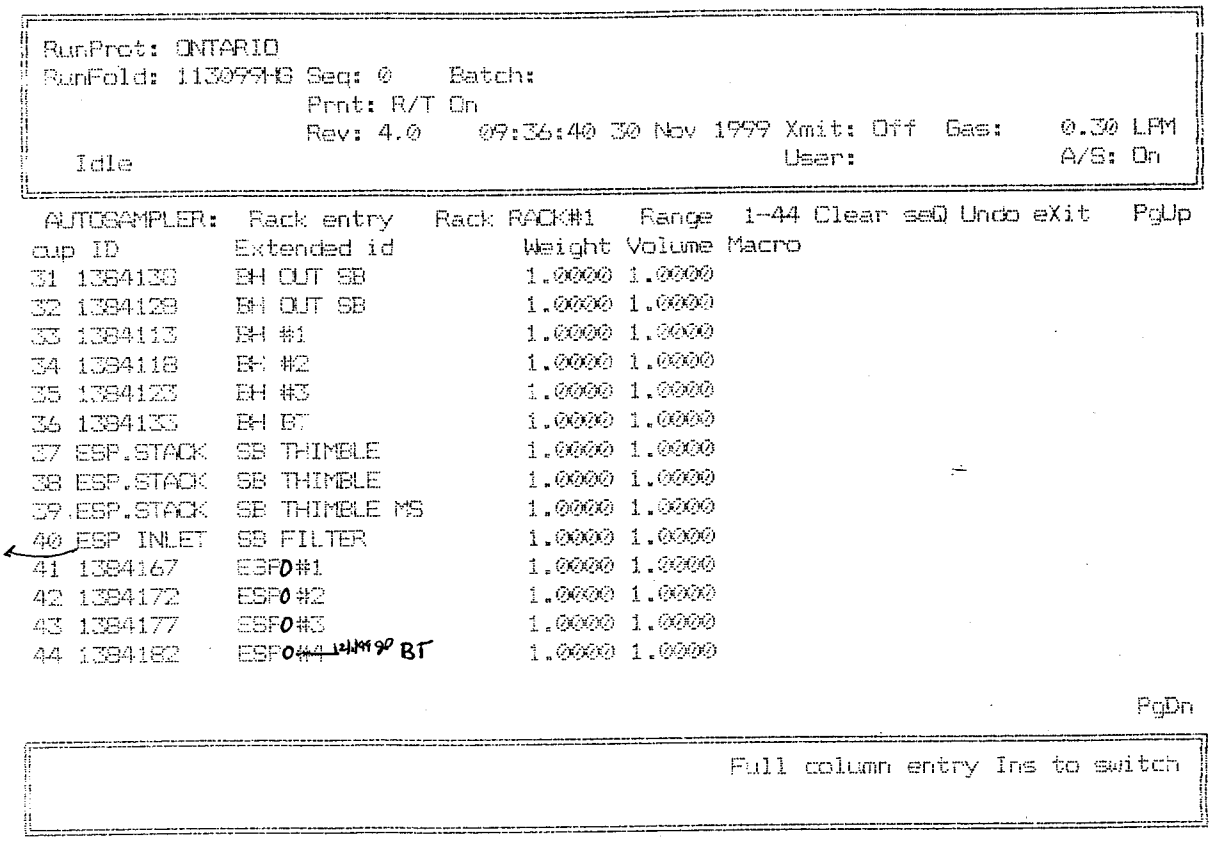
FgDn

Full column entry Ins to switch

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:36:37 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
 AUTOSAMPLER:  Rack entry   Rack RACK#1   Range  1-44 Clear seQ Undo eXit   PgUp
cup ID         Extended id          Weight Volume Macro
16 1382181     INLET #3             1.0000 1.0000
17 1382190     INLET BT             1.0000 1.0000
18 1382211     STACK #1             1.0000 1.0000
19 1382215     STACK #2             1.0000 1.0000
20 1382219     STACK #3             1.0000 1.0000
21 1382228     STACK BT             1.0000 1.0000
22 LRB-ASH     11/29 FILTERS/THIMB.1.0000 1.0000
23 LFB-ASH     11/29 FILTERS/THIMB.1.0000 1.0000
24 NIST        COAL FLY ASH #1633B 1.0000 1.0000
25 1384089     FGD-1 INLET          1.0000 1.0000
26 1384089     FGD-1 INLET          1.0000 1.0000
27 1384089 MS  FGD-1 INLET          1.0000 1.0000
28 1384095     FGD-2 INLET          1.0000 1.0000
29 1384101     FGD-3 INLET          1.0000 1.0000
30 1384107     FGD-BT INLET         1.0000 1.0000
                                                                          PgDn
```

```
                                                  Full column entry Ins to switch
```



```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:36:40 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1 Range 1-44 Clear seQ Undo eXit PgUp

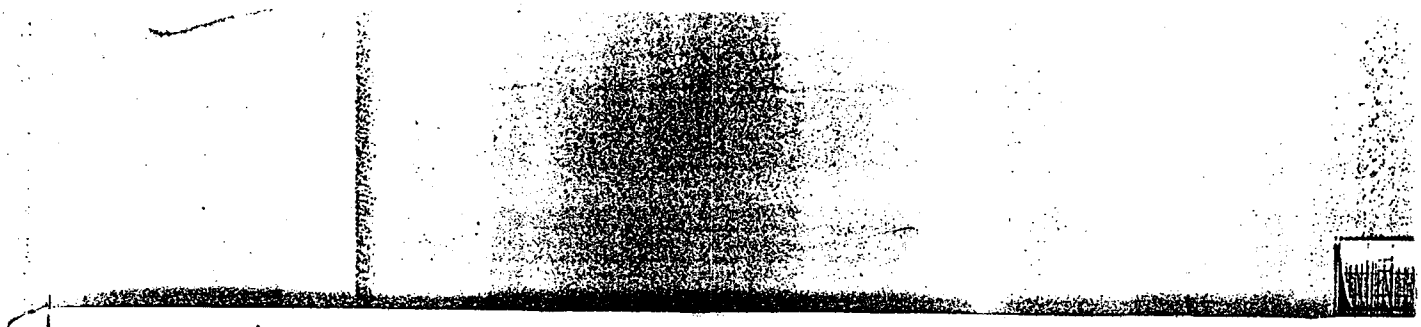
cup	ID	Extended id	Weight	Volume	Macro
31	1384138	BH OUT SB	1.0000	1.0000	
32	1384128	BH OUT SB	1.0000	1.0000	
33	1384113	BH #1	1.0000	1.0000	
34	1384118	BH #2	1.0000	1.0000	
35	1384123	BH #3	1.0000	1.0000	
36	1384133	BH BT	1.0000	1.0000	
37	ESP.STACK	SB THIMBLE	1.0000	1.0000	
38	ESP.STACK	SB THIMBLE	1.0000	1.0000	
39	ESP.STACK	SB THIMBLE MS	1.0000	1.0000	
#1384160 40	ESP INLET	SB FILTER	1.0000	1.0000	
41	1384167	ESP0#1	1.0000	1.0000	
42	1384172	ESP0#2	1.0000	1.0000	
43	1384177	ESP0#3	1.0000	1.0000	
44	1384182	ESP0~~#4~~ 12/14/99 BT	1.0000	1.0000	

PgDn

Full column entry Ins to switch

Reagents, QC, Standards Preparation Log #360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents		Reagent SSM ID #		Final Volume		Dilution Matrix	Remarks
				#	Units		Conc.	#	Units		
1) 11/23/99 1330	SMW		IPC/CCV 5.0ug/l	500	ul	360-29-18	1.00mg/l	100	ml		
2) ↓	↓		ICV/QCS 5.0ug/l	↓	↓	360-29-19	↓	↓	↓		
3) 11/29/99 0900	JH	11/30/99	1.00mg/l Hg stock std	100	ul	Hg-995118501.9	1000mg/l	100	ml	0.15% HNO_3	
4) ↓	↓	↓	1.00mg/l Hg QCS std	100	↓	Hg-995123001	↓	↓	↓	↓	
5) 11/29/99 1300	SMW		Cal Blk	—	—	—	—	100	ml	10% HCl	Ontario Method
6)			0.20ug/l Hg Std	20	ul	360-30-3	1.00mg/l				
7)			0.50	50							
8)			2.00	200							
9)			5.00	500							
10)			10.0	1000							
11)			IPC/CCV ~~2.0~~ 5.0ug/l	500							
12) ↓	↓		ICV/QCS 5.0ug/l	500	↓	360-30-4	↓	↓	↓	↓	↓
13)											
14)											
15)											
16)											
17)											
18)											
19)											
20)											
21)											
22)											
23)											
24)											
25)											



Book #118

Ontario Hydro Method (10/27/99 Draft)

187901 – 187900

Analyst, Date, Time	Sample ID	Initial sample mass (g)	Final vol. or mass of sample aliquot (mL or g)	Total volume of sample digested (mL)	Vol. of 1% HNO_3 added (mL)	Vol. of 1% H_2O_2 added (mL)	Vol. of 5% KMnO4 added (mL)	Vol. of 1% HCl (mL)	Vol. of 5% KMnO4 added (mL)	Vol. of 0.2 M H_2SO_4 (mL)	Analyst, Date
11/19/99 GHP 1300	1382166	0.750 g	0.750 g	30 mL	1.5 mL	0.75 mL	4.5 mL	—	2.25 mL	3.0 mL	11/29/99
	2170	0.480 g	0.500 g					—			
	2174	0.950 g	0.950 g					—			
	2178	0.900 g	0.900 g					—			
	2182	0.840 g	0.840 g					—			
	2191	0.550 g	0.550 g					—			
	2202	0.695 g	0.695 g					—			
	2216	0.787 g	0.787 g					—			
	2220	0.800 g	0.800 g					—			
	2229	0.480 g	0.500 g					—			
11/22/99 0710 GHP	LRB-KMnO4	—	—	30 mL	—	1.5 mL	4.5 mL	—	2.25 mL	3.0 mL	
	LFB-KMnO4 (2 mg Hg)	—	—		—		4.5 mL	—			
	1382235 client Blk	0.250 g	0.500 g		—		4.5 mL	—			
	1382187	0.350 g			—		4.5 mL	—			
	1382160	0.480 g			—		4.5 mL	—			
	2164	0.545 g	0.545 g		—		4.5 mL	—			
	2168	0.600 g	0.600 g		—		4.5 mL	—			
	2172	0.495 g	0.500 g		—		4.5 mL	—			
Kmno4 portion decanted day of analysis	2176	0.470 g			—		4.5 mL	—			
	2180	0.480 g			—		5.0 mL	—			
	2184	0.440 g			—		7.5 mL	—			
	2193	0.514 g	0.514		—		4.5 mL	—			
	2214	0.430 g	0.500		—		4.5 mL	—			
	3218	0.435 g	0.500 g		—		4.5 mL	—			
	2222	0.530 g	0.530 g		—		4.5 mL	—			
	2231	0.430 g	0.500 g		—		10.5 mL	—			
11/29/99 0840 GHP	XRB-Ash	—	0.100 g	30 mL	—	1.25 mL	—	3.75 mL	—	—	
	XFB-Ash NIST-Coal FA NA-XL*K33B	—	0.100 g	30 mL	—		—		—	—	
	1382194	3.0906 g		0.50 g whole thimble	—		—		—	—	
	1382186	0.3906 g		filter only thimble	—		—		—	—	
	1382224	3.2878 g			—		—		—	—	
	1382157	0.3965 g		filter	—		—		—	—	
	1382161	0.3928 g			—		—		—	—	
	1382165	0.3973 g			—		—		—	—	
	1382169	0.3990 g			—		—		—	—	
	1382123	3.0145 g		whole thimble	—		—		—	—	
	1382177	3.2892 g			—		—		—	—	
	1382181	3.3983 g			—		—		—	—	
	1382190	3.1694 g			—		—		—	—	

Leak portion

* Spk w/ 20 mL of 100 mg/L Hg Std

188322

Acronyms, Date + Time	Sample ID.	Initial Sample Wt. (Tare-acct'g)	Final vol'n acid sample diluted up to (L)	Total Vol. of Sample digested (Aqua Regia) (mL)	Vol.ⁿ of Trace metal H_2SO_4 (mL)	Vol.ⁿ of trace metal HNO_3 (mL)	5% HNO_3 (mL)	Vol.ⁿ of HCl (mL)	Vol.ⁿ of 5% $K_2Cr_2O_7$ (mL)	Vol.ⁿ of 10% Hydroxyl amine (mL)	Comments
11/29/99 GHP	1382211	3.4387g	0.100L	Whole Thimble	—	1.25mL	—	3.75mL	—	—	Stack #1
add portion	1382215	3.6599g			—		—		—	—	Stack #2
	1382219	3.2602g			—		—		—	—	Stack #3
	1382228	3.5245g			—		—		—	—	Stack BT
11/29/99 1240 GHP	LRB-Ash Filters/thimble	N/A		—	—		—		—	—	—
	LFB-Ash filters/thimble			—	—		—		—	—	Sp w/ 2mL HNO3
	LRBT - Coal Fly Ash - Lot #1633 Filter			0.327g 0.500g Filter/thimble	—		—		—	—	—
	1384089 2 Filters			whole filter 2 filters	—		—		—	—	FGD-1 Inlet
	1384095 Filter				—		—		—	—	FGD-2 Inlet
	1384101 Filter			whole filter	—		—		—	—	FGD-3 Inlet
	1384107 Thimble				—		—		—	—	FGD-BT Inlet
	1384138 Filter			whole thimble	—		—		—	—	All out SB
	1384128 filter			whole filter	—		—		—	—	BH out SB
	1384113 filter				—		—		—	—	BH #1
	1384118 filter				—		—		—	—	BH #2
	1384123 filter				—		—		—	—	BH #3
	1384133 Thimble				—		—		—	—	BH BT
	ESP-Stack-SB 13 filters 4160			whole thimble whole filter	—		—		—	—	ESP Stack SB
	ESP-Inlet-SB filter				—		—		—	—	ESP Inlet
	1384167 filter				—		—		—	—	ESP #1
	1384172 filter				—		—		—	—	ESP #2
	1384177 filter				—		—		—	—	ESP #3
	1384182				—		—		—	—	ESP BT

Notes: Samples & QC prepared on 11/29/99 were placed in a 95°C water bath for 8 hours. After cooling, 3.5g of boric acid was added. GHP

11/22/99 Water

1382157 Sample wt. = 0.3965g.

1382173 Sample wt. = 3.0145g W-1 ← wt. = 0.0538g

1382165 Sample wt. = 0.3973

1382186 Sample wt = 0.3908

1382190 Sample wt. = 3.1694

1382177 Sample wt = 3.2812 W-3 ← wt. = 0.0539g

1382224 Sample wt = 3.2878

1382161 Sample wt. = 0.3928.

1382211 Sample wt. = 3.4987 W-4 ← wt. = .0014g

1382219 Sample wt = 3.2602 W-6 ← wt. = ~~.0004g~~ .0023g

1382194 Sample wt = 3.0906.

1382169 Sample wt = 0.3790

1382215 Sample wt. = 3.6599 W-5 ← wt. = .0028g

1382181 Sample wt. = 3.3983 W-2 ← wt. = ~~0.1356g~~ 0.0356g

1382228 Sample wt. = 3.5245

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:38:15 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1   28
Aper test              Tip Y      0 1    1
Test optic             Tip Z     95 1    0
Tip home               Gas      322
Out port
In port
Run pcode
Cal A/S
```

aperture 21

acceptable Range = -100 to +100

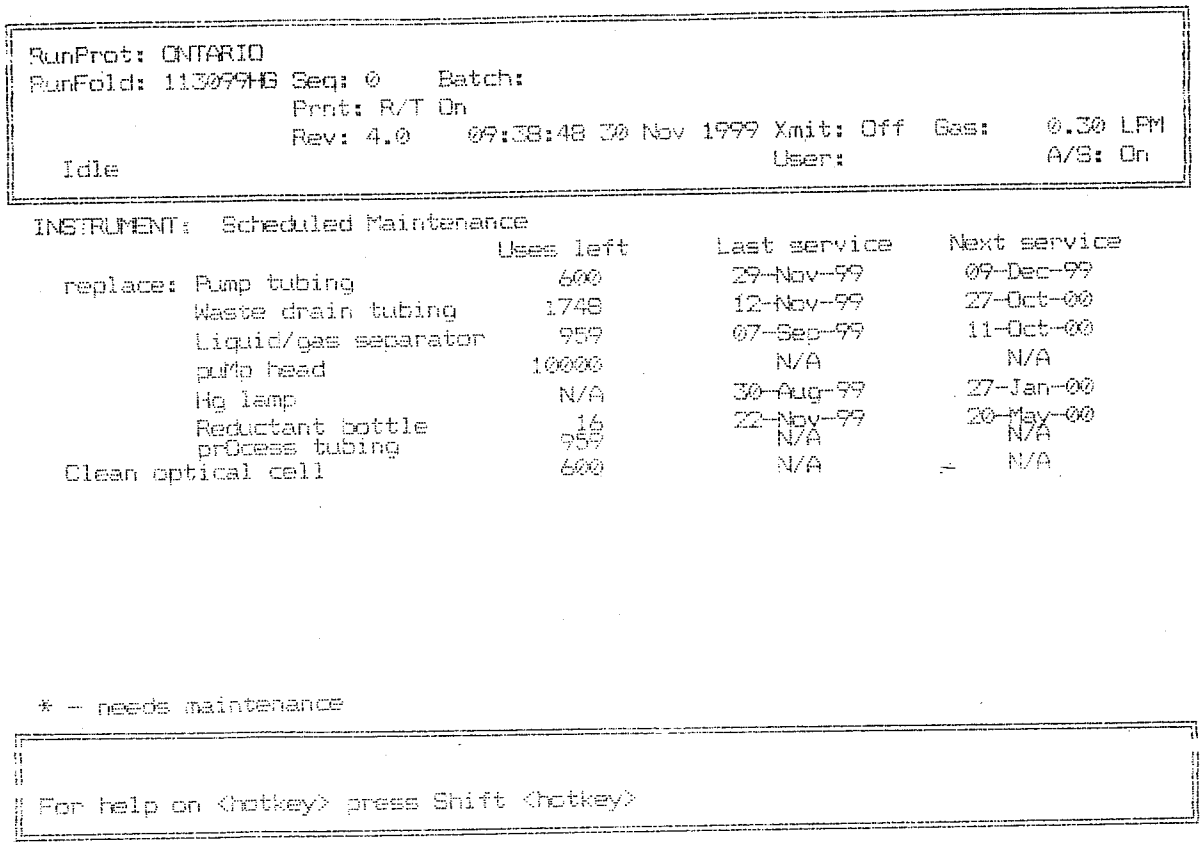
```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 344
```

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:38:23 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1   28
Aper test              Tip Y      0 1    1
Test optic             Tip Z     95 1    0
Tip home               Gas      322
Out port                                        Smpl. intensity    1104637
In port                                         Ref. intensity     1103677
Run pcode
Cal A/S
```

} <10% difference

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0     @ 142
```


RunProt: ONTARIO
RunFold: 113099H6 Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 09:38:48 30 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle
User: A/S: On
INSTRUMENT: Scheduled Maintenance
Usees left
Last service
Next service
replace: Pump tubing 600 29-Nov-99 09-Dec-99
Waste drain tubing 1748 12-Nov-99 27-Oct-00
Liquid/gas separator 959 07-Sep-99 11-Oct-00
pump head 10000 N/A N/A
Hg lamp N/A 30-Aug-99 27-Jan-00
Reductant bottle 16 22-Nov-99 20-May-00
process tubing 959 N/A N/A
Clean optical cell 600 N/A N/A
* - needs maintenance
For help on <hotkey> press Shift <hotkey>

RunFold: 113099HG Seq: 152 Batch:
Prnt: R/T On
Rev: 4.0 15:48:48 30 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle User: A/S: On

INSTRUMENT: Scheduled Maintenance

	Uses left	Last service	Next service
replace: Pump tubing	447	29-Nov-99	09-Dec-99
Waste drain tubing	1595	12-Nov-99	27-Oct-00
Liquid/gas separator	806	07-Sep-99	11-Oct-00
puMp head	10000	N/A	N/A
Hg lamp	N/A	30-Aug-99	27-Jan-00
Reductant bottle	400	30-Nov-99	28-May-00
prOcess tubing	806	N/A	N/A
Clean optical cell	600	N/A	N/A

* = needs maintenance

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Standard: 1 Rep: 1				Seq: 3		10:04:25 30 Nov 1999 HG			
Hg	.000	ug/l	269						
*** Standard: 1 Rep: 1				Seq: 4		10:15:14 30 Nov 1999 HG			
Hg	.000	ug/l	-49						
*** Standard: 1 Rep: 2				Seq: 5		10:17:24 30 Nov 1999 HG			
Hg	.000	ug/l	450						
*** Standard: 2 Rep: 1				Seq: 6		10:19:37 30 Nov 1999 HG			
Hg	.200	ug/l	18985						
*** Standard: 2 Rep: 2				Seq: 7		10:21:46 30 Nov 1999 HG			
Hg	.200	ug/l	19457						
*** Standard: 3 Rep: 1				Seq: 8		10:23:57 30 Nov 1999 HG			
Hg	.500	ug/l	49954						
*** Standard: 3 Rep: 2				Seq: 9		10:26:07 30 Nov 1999 HG			
Hg	.500	ug/l	49653						
*** Standard: 4 Rep: 1				Seq: 10		10:28:17 30 Nov 1999 HG			
Hg	2.00	ug/l	204003						
*** Standard: 4 Rep: 2				Seq: 11		10:30:31 30 Nov 1999 HG			
Hg	2.00	ug/l	203494						
*** Standard: 5 Rep: 1				Seq: 12		10:32:44 30 Nov 1999 HG			
Hg	5.00	ug/l	504555						
*** Standard: 5 Rep: 2				Seq: 13		10:35:08 30 Nov 1999 HG			
Hg	5.00	ug/l	509513						
*** Standard: 6 Rep: 1				Seq: 14		10:37:32 30 Nov 1999 HG			
Hg	10.0	ug/l	986885						

11/30/99 gp

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

*** Standard: 6 Rep: 2 Seq: 15 10:40:02 30 Nov 1999 HG

Hg 10.0 ug/l 990073

RunProt: ONTARIO

RunFold: 113099MG Seq: 16 Batch:

Prnt: R/T On

Rev: 4.0 10:40:18 30 Nov 1999 Xmit: Off Gas: 0.30 LPM

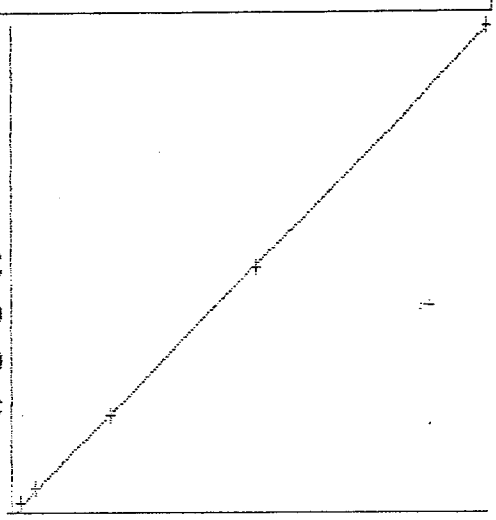
Idle User: A/S: On

CALIBRATION: Line proto: ONTARIO

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.017	-.017	Quadratic
S2	.200	.174	-.026	Wtdlinear
S3	.500	.481	-.019	C
S4	2.00	2.03	.029	Accept
S5	5.00	5.08	.077	n
S6	10.0	9.96	-.044	c

A .0000000 r .999935

B 1.00511e-5 C -1.92614e-2



	Mean	%RSD		Relative Absorbance
S1	200	175.98	-49	458
S2	19221	1.74	18985	19457
S3	49816	0.36	49954	49683
S4	203748	0.18	204003	203494
S5	507034	0.69	504555	509513
S6	992479	0.8	986885	998073

New cal coefficients stored

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 16 10:43:20 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.11	5.00	ug/l	.000

$\bar{x}$ = 5.09 ug/l (102% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 17 10:45:48 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.07	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 18 10:48:10 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-32400	-.032	.000	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 19 10:50:16 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.021	.200	ug/l	.000

*** Sample ID: QCS Seq: 20 10:52:22 30 Nov 1999 HG

11/29 5.00UG/L

Hg	5.00	ug/l	.000	5.00	

$\bar{x}$ = (5.00 ug/l) (100% R)

*** Sample ID: QCS Seq: 21 10:54:47 30 Nov 1999 HG

11/29 5.00UG/L

Hg	5.00	ug/l	.000	5.00	

*** Sample ID: LRB-ASH Seq: 22 10:57:11 30 Nov 1999 HG

<0.2

11/29 DIH2O

Hg	.031	ug/l	.000	.031	

$\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

*** Sample ID: LRB-ASH Seq: 23 10:59:15 30 Nov 1999 HG

<0.2

11/29 DIH2O

Hg	.037	ug/l	.000	.037	

*** Sample ID: LFB-ASH Seq: 24 11:01:20 30 Nov 1999 HG

11/29 DIH2O

Hg	2.01	ug/l	.000	2.01	

LFB T.V. = 2.00 ug/l x 0.100 l = (0.200 ug)

$\bar{x}$ = 2.03 ug/l x 0.100 l = (0.203 ug) (101% R)

*** Sample ID: LFB-ASH Seq: 25 11:03:36 30 Nov 1999 HG

11/29 DIH2O

Hg	2.04	ug/l	.000	2.04	

*** Sample ID: NIST Seq: 26 11:05:52 30 Nov 1999 HG

COAL FLY ASH #1633B

Hg	.750	ug/l	.000	.750	

T.V. = 0.141 ± 0.019 mg/g

$\bar{x}$ = 0.749 ug/l x $\frac{0.100\ l}{0.500\ g}$ = (0.150 mg/g)

*** Sample ID: NIST Seq: 27 11:07:58 30 Nov 1999 HG

COAL FLY ASH #1633B

Hg	.747	ug/l	.000	.747	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382194					Seq: 28	11:10:03 30 Nov 1999 HG		
	<0.2			INLET SB				
Hg	.130	ug/l	.0000	.130				
*** Sample ID: 1382194					Seq: 29	11:12:07 30 Nov 1999 HG		
	<0.2			INLET SB				
Hg	.135	ug/l	.0000	.135				
*** Check Standard: 4 Ck4IPC/CCV					Seq: 30	11:14:13 30 Nov 1999 HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		104.	5.18	5.00	ug/l	.0000		
*** Check Standard: 3 Ck3IPC/CCV					Seq: 31	11:16:30 30 Nov 1999 HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		103.	5.13	5.00	ug/l	.0000		
*** Check Standard: 2 Ck2ICB/CCB					Seq: 32	11:18:52 30 Nov 1999 HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		-28300	-.0028	.0000	ug/l	.0000		
*** Check Standard: 1 Ck1ICB/CCB					Seq: 33	11:20:58 30 Nov 1999 HG		
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.0023	.2000	ug/l	.0000			
*** Sample ID: 1382186					Seq: 34	11:23:04 30 Nov 1999 HG		
	<0.2			INLET SB				
Hg	.081	ug/l	.0000	.081				
*** Sample ID: 1382186					Seq: 35	11:25:08 30 Nov 1999 HG		
	<0.2			INLET SB				
Hg	.079	ug/l	.0000	.079				
*** Sample ID: 1382224					Seq: 36	11:27:13 30 Nov 1999 HG		
	<0.2			STACK SB				
Hg	.099	ug/l	.0000	.099				
*** Sample ID: 1382224					Seq: 37	11:29:19 30 Nov 1999 HG		
	<0.2			STACK SB				
Hg	.100	ug/l	.0000	.100				
*** Sample ID: 1382157					Seq: 38	11:31:24 30 Nov 1999 HG		
	<0.2			OUTLET #1				
Hg	.051	ug/l	.0000	.051				
*** Sample ID: 1382157					Seq: 39	11:33:29 30 Nov 1999 HG		
	<0.2			OUTLET #1				
Hg	.049	ug/l	.0000	.049				

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

5.15 ug/l (104 %R)

$\bar{x}$ = <0.2 ug/l

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382161				Seq: 40	11:35:33 30 Nov 1999 HG			
	<0.2			OUTLET #2				
Hg	.052	ug/l	.000	.052				
*** Sample ID: 1382161				Seq: 41	11:37:39 30 Nov 1999 HG			
	<0.2			OUTLET #2				
Hg	.054	ug/l	.000	.054				
*** Sample ID: 1382165				Seq: 42	11:39:44 30 Nov 1999 HG			
	<0.2			OUTLET #3				
Hg	.019	ug/l	.000	.019				
*** Sample ID: 1382165				Seq: 43	11:41:50 30 Nov 1999 HG			
	<0.2			OUTLET #3				
Hg	.020	ug/l	.000	.020				
*** Check Standard: 4 Ck4IPC/CCV				Seq: 44	11:43:55 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		92.1	4.60	5.00	ug/l	.000		
*** Check Standard: 3 Ck3IPC/CCV				Seq: 45	11:46:40 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		97.8	4.89	5.00	ug/l	.000		
*** Check Standard: 2 Ck2ICB/CCB				Seq: 46	11:48:57 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		-33200	-.033	.000	ug/l	.000		
*** Check Standard: 1 Ck1ICB/CCB				Seq: 47	11:51:03 30 Nov 1999 HG			
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.024	.200	ug/l	.000			
*** Sample ID: 1382169				Seq: 48	11:53:09 30 Nov 1999 HG			
	<0.2			OUTLET BT				
Hg	.016	ug/l	.000	.016				
*** Sample ID: 1382169				Seq: 49	11:55:15 30 Nov 1999 HG			
	<0.2			OUTLET BT				
Hg	.019	ug/l	.000	.019				
*** Sample ID: 1382173				Seq: 50	11:57:19 30 Nov 1999 HG			
	<0.2			INLET #1				
Hg	.096	ug/l	.000	.096				
*** Sample ID: 1382173				Seq: 51	11:59:22 30 Nov 1999 HG			
	<0.2			INLET #1				
Hg	.096	ug/l	.000	.096				

$\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

$\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

6% difference

$\bar{x}$ = (4.75 ug/l) (95%R)

$\bar{x}$ = (<0.2 ug/l)

$\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

$\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

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

quired
plicate
eplicates

*** Sample ID: 1382177 Seq: 52 12:01:26 30 Nov 1999 HG
<0.2 INLET #2
Hg .149 ug/l .000 .149 $\bar{X}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382177 Seq: 53 12:03:30 30 Nov 1999 HG
<0.2 INLET #2
Hg .151 ug/l .000 .151

*** Sample ID: 1382177 Seq: 54 12:05:34 30 Nov 1999 HG
<0.2 INLET #2
Hg .136 ug/l .000 .136

*** Sample ID: 1382177 Seq: 55 12:07:39 30 Nov 1999 HG
11/30/99 JP INLET #2
Hg .132 ug/l .000 .132

*** Sample ID: 1382177 MS matrix Spk Seq: 56 12:09:46 30 Nov 1999 HG
matrix Spk T.V. = 2.00 ug/l x 0.100 l = 0.200 ug
INLET #2
Hg 1.96 ug/l .000 1.96 $\bar{X}$ = 1.94 ug/l x 0.100 l = 0.194 ug 97%R

*** Sample ID: 1382177 MS Seq: 57 12:11:59 30 Nov 1999 HG
INLET #2
Hg 1.93 ug/l .000 1.93

*** Check Standard: 4 Ck4IPC/CCV Seq: 58 12:14:15 30 Nov 1999 HG 6% difference
Line Flag %Rcv. Found True Units SD/RSD
Hg 94.8 4.74 ✓ 5.00 ✓ ug/l .000 $\bar{X}$ = 4.83 ug/l 97%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 59 12:16:43 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.1 4.91 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 60 12:19:07 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -29700 -.030 ✓ .000 ug/l .000 $\bar{X}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 61 12:21:14 30 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.022 ✓ .200 ug/l .000

*** Sample ID: 1382181 Seq: 62 12:23:20 30 Nov 1999 HG
<0.2 INLET #3
Hg .041 ug/l .000 .041 $\bar{X}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382181 Seq: 63 12:25:23 30 Nov 1999 HG
<0.2 INLET #3
Hg .042 ug/l .000 .042

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

*** Sample ID: 1382190 Seq: 64 12:27:29 30 Nov 1999 HG
<0.2 INLET BT
Hg .071 ug/l .000 .071 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382190 Seq: 65 12:29:33 30 Nov 1999 HG
<0.2 INLET BT
Hg .068 ug/l .000 .068

*** Sample ID: 1382211 Seq: 66 12:31:37 30 Nov 1999 HG
<0.2 STACK #1
Hg .048 ug/l .000 .048 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382211 Seq: 67 12:33:41 30 Nov 1999 HG
<0.2 STACK #1
Hg .052 ug/l .000 .052

*** Sample ID: 1382215 Seq: 68 12:35:46 30 Nov 1999 HG
<0.2 STACK #2
Hg .176 ug/l .000 .176 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382215 Seq: 69 12:37:50 30 Nov 1999 HG
<0.2 STACK #2
Hg .176 ug/l .000 .176

*** Sample ID: 1382219 Seq: 70 12:39:55 30 Nov 1999 HG
<0.2 STACK #3
Hg .067 ug/l .000 .067 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382219 Seq: 71 12:42:00 30 Nov 1999 HG
<0.2 STACK #3
Hg .066 ug/l .000 .066

*** Check Standard: 4 Ck4IPC/CCV Seq: 72 12:44:06 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.6	4.98 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.95 ug/l 99 %l

(pour rat in IPC into cup)

*** Check Standard: 3 Ck3IPC/CCV Seq: 73 12:46:28 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	4.93 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 74 12:48:47 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-29200	-.029	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 75 12:50:54 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.021	.200	ug/l	.000

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

*** Sample ID: 1382228 Seq: 76 12:53:00 30 Nov 1999 HG
STACK BT
Hg <0.2 .064 ug/l .000 .064
$\bar{X}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1382228 Seq: 77 12:55:05 30 Nov 1999 HG
STACK BT
Hg <0.2 .063 ug/l .000 .063

*** Sample ID: LRB-ASH For PJ# 188323 + 188322 Seq: 78 12:57:12 30 Nov 1999 HG
11/29 FILTERS/THIMB.
Hg <0.2 .024 ug/l .000 .024
$\bar{X}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: LRB-ASH Seq: 79 12:59:18 30 Nov 1999 HG
11/29 FILTERS/THIMB.
Hg <0.2 .025 ug/l .000 .025

*** Sample ID: LFB-ASH Seq: 80 13:01:23 30 Nov 1999 HG
11/29 FILTERS/THIMB. LFB T.V. = 2.00ug/l x 0.100l = 0.200ug
Hg 1.97 ug/l .000 1.97
$\bar{X}$ = 1.98ug/l x 0.100l = 0.198ug (99%R)

*** Sample ID: LFB-ASH Seq: 81 13:03:40 30 Nov 1999 HG
11/29 FILTERS/THIMB.
Hg 1.98 ug/l .000 1.98

*** Sample ID: NIST Seq: 82 13:05:55 30 Nov 1999 HG
COAL FLY ASH #1633B T.V. = 0.141ug/g ± 0.019ug/g
Hg .847 ug/l .000 .847
$\bar{X}$ = 0.850ug/l x $\frac{0.100l}{0.50g}$ = 0.163 ug/g

See Recheck pg. #602

11/29/99 gh

*** Sample ID: NIST Seq: 83 13:08:00 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .853 ug/l .000 .853

*** Sample ID: 1384089 Seq: 84 13:10:06 30 Nov 1999 HG
FGD-1 INLET
Hg <0.2 .063 ug/l .000 .063
$\bar{X}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1384089 Seq: 85 13:12:11 30 Nov 1999 HG
FGD-1 INLET
Hg <0.2 .059 ug/l .000 .059

*** Check Standard: 4 Ck4IPC/CCV Seq: 86 13:14:19 30 Nov 1999 HG
(98%R)

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

$\bar{X}$ = 4.91ug/l

*** Check Standard: 3 Ck3IPC/CCV Seq: 87 13:16:41 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.0	4.90 ✓	5.00	ug/l	.000

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

*** Check Standard: 2 Ck2ICB/CCB Seq: 88 13:19:01 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-30.000	-.030	.000	ug/l	.000

$\bar{X}$ = (<0.2ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 89 13:21:08 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.024	.200	ug/l	.000

*** Sample ID: 1384089 Seq: 90 13:23:15 30 Nov 1999 HG

FSD-1 INLET

	<0.2				
Hg	.021	ug/l	.000	.021	

$\bar{X}$ = <0.2ug/l x 0.100 = (<0.02mg)

*** Sample ID: 1384089 Seq: 91 13:25:20 30 Nov 1999 HG

FSD-1 INLET

	<0.2				
Hg	.023	ug/l	.000	.023	

*** Sample ID: 1384089 MS matrix Spk Seq: 92 13:27:25 30 Nov 1999 HG

FSD-1 INLET

matrix Spk T.V. = 2.00ug/l x 0.100l = (0.200mg)

Hg	1.90	ug/l	.000	1.90	

$\bar{X}$ = 1.88ug/l x 0.100l = (0.188mg) (94%R)

*** Sample ID: 1384089 MS Seq: 93 13:29:36 30 Nov 1999 HG

FSD-1 INLET

Hg	1.87	ug/l	.000	1.87	

*** Sample ID: 1384095 Seq: 94 13:31:46 30 Nov 1999 HG

FSD-2 INLET

(Data was confirmed on pg. #602)

Hg	1.19	ug/l	.000	1.19	

$\bar{X}$ = 1.20ug/l x 0.100l = (0.120mg)

*** Sample ID: 1384095 Seq: 95 13:33:54 30 Nov 1999 HG

FSD-2 INLET

Hg	1.21	ug/l	.000	1.21	

*** Sample ID: 1384101 Seq: 96 13:36:02 30 Nov 1999 HG

FSD-3 INLET

	<0.2				
Hg	.015	ug/l	.000	.015	

$\bar{X}$ = <0.2ug/l x 0.100l = (<0.02mg)

*** Sample ID: 1384101 Seq: 97 13:38:08 30 Nov 1999 HG

FSD-3 INLET

	<0.2				
Hg	.018	ug/l	.000	.018	

*** Sample ID: 1384107 Seq: 98 13:40:13 30 Nov 1999 HG

FSD-ET INLET

	<0.2				
Hg	.111	ug/l	.000	.111	

$\bar{X}$ = <0.2ug/l x 0.100l = (<0.02mg)

*** Sample ID: 1384107 Seq: 99 13:42:20 30 Nov 1999 HG

FSD-ET INLET

	<0.2				
Hg	.109	ug/l	.000	.109	

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 100 13:44:27 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.03	5.00	ug/l	.000

$\bar{x}$ = 4.98 ug/l (100%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 101 13:46:47 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.6	4.93	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 102 13:49:07 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-2910%	-.029 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 103 13:51:14 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.019 ✓	.200	ug/l	.000

*** Sample ID: 1384138 Seq: 104 13:53:19 30 Nov 1999 HG

BH OUT SB

Hg	<0.2 .047	ug/l	.000	.047	

$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384139 Seq: 105 13:55:25 30 Nov 1999 HG

BH OUT SB

Hg	<0.2 .047	ug/l	.000	.047	

*** Sample ID: 1384128 Seq: 106 13:57:31 30 Nov 1999 HG

BH OUT SB

Hg	<0.2 .106	ug/l	.000	.106	

$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384129 Seq: 107 13:59:37 30 Nov 1999 HG

BH OUT SB

Hg	<0.2 .111	ug/l	.000	.111	

*** Sample ID: 1384113 Seq: 108 14:01:43 30 Nov 1999 HG

BH #1

Hg	.218	ug/l	.000	.218	

$\bar{x}$ = 0.218 ug/l × 0.100 l = 0.0218 ug

*** Sample ID: 1384113 Seq: 109 14:03:48 30 Nov 1999 HG

BH #1

Hg	.217	ug/l	.000	.217	

*** Sample ID: 1384118 Seq: 110 14:05:55 30 Nov 1999 HG

BH #2

Hg	.233	ug/l	.000	.233	

$\bar{x}$ = 0.234 ug/l × 0.100 l = 0.0234 ug

*** Sample ID: 1384118 Seq: 111 14:08:01 30 Nov 1999 HG

BH #2

Hg	.236	ug/l	.000	.236	

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

*** Sample ID: 1384123 Seq: 112 14:10:08 30 Nov 1999 HG

BH #3

Hg <0.2 .095 ug/l .000 .095

$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384123 Seq: 113 14:12:15 30 Nov 1999 HG

BH #3

Hg <0.2 .093 ug/l .000 .093

*** Check Standard: 4 Ck4IPC/CCV Seq: 114 14:14:21 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.98 ug/l 99%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 115 14:16:39 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.8	4.94 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 116 14:18:58 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-29000	-.029 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 117 14:21:05 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.019 ✓	.200	ug/l	.000

*** Sample ID: 1384133 Seq: 118 14:23:11 30 Nov 1999 HG

BH BT

Hg <0.2 .046 ug/l .000 .046

$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384133 Seq: 119 14:25:18 30 Nov 1999 HG

BH BT

Hg <0.2 .049 ug/l .000 .049

used dilute analysis.

*** Sample ID: ESP.STACK Seq: 120 14:27:25 30 Nov 1999 HG

SB THIMBLE

Hg <0.2 .041 ug/l .000 .041

$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: ESP.STACK Seq: 121 14:29:33 30 Nov 1999 HG

SB THIMBLE

Hg <0.2 .032 ug/l .000 .032

*** Sample ID: ESP.STACK Seq: 122 14:31:40 30 Nov 1999 HG

SB THIMBLE

Hg <0.2 .036 ug/l .000 .036

*** Sample ID: ESP.STACK Seq: 123 14:33:47 30 Nov 1999 HG

SB THIMBLE

Hg .037 ug/l .000 .037

4/30/99 gR

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

*** Sample ID: ESP.STACK Matrix Spk. Seq: 124 14:35:54 30 Nov 1999 HG
SB THIMBLE MS
Hg 1.69 ug/l .000 1.69
Matrix Spike T.V. = 2.00ug/l x 0.100 l = 0.200 ug
$\bar{x}$ = 1.69ug/l x 0.100 l = 0.169ug (85%R)

*** Sample ID: ESP.STACK Seq: 125 14:38:03 30 Nov 1999 HG
SB THIMBLE MS
Hg 1.68 ug/l .000 1.68

*** Sample ID: ESP INLET #1384160 Seq: 126 14:40:13 30 Nov 1999 HG
<0.2 SB FILTER
Hg .008 ug/l .000 .008
$\bar{x}$ = <0.2ug/l x 0.100 l = <0.02ug

*** Sample ID: ESP INLET Seq: 127 14:42:20 30 Nov 1999 HG
<0.2 SB FILTER
Hg .009 ug/l .000 .009

*** Check Standard: 4 Ck4IPC/CCV Seq: 128 14:44:28 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.96ug/l (99%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 129 14:46:45 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 130 14:49:02 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-30000	-.030	.000	ug/l	.000

$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 131 14:51:09 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.023	.200	ug/l	.000

*** Sample ID: 1384167 Seq: 132 14:53:15 30 Nov 1999 HG
ESP0#1
Hg 13.8 ug/l .000 13.8
$\bar{x}$ = 13.9ug/l x 0.100 l = 1.39ug

*** Sample ID: 1384167 Seq: 133 14:56:42 30 Nov 1999 HG
ESP0#1
Hg 13.9 ug/l .000 13.9

*** Sample ID: 1384172 Seq: 134 14:58:10 30 Nov 1999 HG
ESP0#2
Hg 7.67 ug/l .000 7.67
$\bar{x}$ = 7.68ug/l x 0.100 l = 0.768ug

*** Sample ID: 1384172 Seq: 135 15:00:30 30 Nov 1999 HG
ESP0#2
Hg 7.70 ug/l .000 7.70

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

see dilution Below.

*** Sample ID: 1384177 Seq: 136 15:02:48 30 Nov 1999 HG
ESPO#3
Hg 21.3 ug/l .000 21.3
11/30/99 gf

*** Sample ID: 1384177 Seq: 137 15:05:18 30 Nov 1999 HG
ESPO#3
Hg 21.6 ug/l .000 21.6

*** Sample ID: 1384182 Seq: 138 15:08:00 30 Nov 1999 HG
<0.2 ESPO~~#4~~ gf BT
Hg -.002 ug/l .000 -.002
$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1384182 Seq: 139 15:10:07 30 Nov 1999 HG
<0.2 ESPO~~#4~~ gf BT
Hg .006 ug/l .000 .006

*** Sample ID: NIST Seq: 140 15:14:23 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .641 ug/l .000 .641
Acid washed filter before analysis. - forgot to dump acid water before filtering. 11/30/99 gf

*** Sample ID: NIST Seq: 141 15:16:28 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .646 ug/l .000 .646

*** Sample ID: NIST Refiltered 0.52g/100ml Seq: 142 15:22:40 30 Nov 1999 HG 2% difference
COAL FLY ASH #1633B
Hg .742 ug/l .000 .742
$\bar{x}$ = 0.735 ug/l x $\frac{0.100 l}{0.52 g}$ = 0.141 ug/g
T.V. = 0.141 ± 0.019 ug/g

*** Sample ID: NIST Seq: 143 15:24:45 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .728 ug/l .000 .728

Confirmation only.

*** Sample ID: 1384095 Seq: 144 15:28:15 30 Nov 1999 HG
FGD-2 INLET
Hg 1.17 ug/l .000 1.17
$\bar{x}$ = 1.17 ug/l x 0.100 l = 0.117 ug

*** Sample ID: 1384095 Seq: 145 15:30:21 30 Nov 1999 HG
FGD-2 INLET
Hg 1.16 ug/l .000 1.16

*** Sample ID: 1384177 Seq: 146 15:32:45 30 Nov 1999 HG
esp #3 1:10 dilution
Hg 2.47 ug/l .000 2.47
$\bar{x}$ = 2.47 ug/l x 0.100 l x 10 = 2.47 ug

*** Sample ID: 1384177 Seq: 147 15:34:57 30 Nov 1999 HG
esp #3 1:10
Hg 2.47 ug/l .000 2.47

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

*** Sample ID: ESP.STACK Matrix Spk. Seq: 124 14:35:54 30 Nov 1999 HG
SB THIMBLE MS
Hg 1.69 ug/l .000 1.69
Matrix Spike T.V. = 2.00 ug/l X 0.100 l = 0.200 ug
$\bar{x}$ = 1.69 ug/l X 0.100 l = 0.169 ug (85% R)

*** Sample ID: ESP.STACK Seq: 125 14:38:03 30 Nov 1999 HG
SB THIMBLE MS
Hg 1.68 ug/l .000 1.68

*** Sample ID: ESP INLET #1384160 Seq: 126 14:40:13 30 Nov 1999 HG
<0.2
SB FILTER
Hg .008 ug/l .000 .008
$\bar{x}$ = <0.2 ug/l X 0.100 l = (<0.02 ug)

*** Sample ID: ESP INLET Seq: 127 14:42:30 30 Nov 1999 HG
<0.2
SB FILTER
Hg .009 ug/l .000 .009

*** Check Standard: 4 Ck4IPC/CCV Seq: 128 14:44:28 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.96 ug/l (99% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 129 14:46:45 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 130 14:49:02 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-30000	-.030	.000	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 131 14:51:09 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.023	.200	ug/l	.000

*** Sample ID: 1384167 Seq: 132 14:53:15 30 Nov 1999 HG
ESP0#1
Hg 13.8 ug/l .000 13.8
$\bar{x}$ = 13.9 ug/l X 0.100 l = (1.39 ug)

*** Sample ID: 1384167 Seq: 133 14:55:42 30 Nov 1999 HG
ESP0#1
Hg 13.9 ug/l .000 13.9

*** Sample ID: 1384172 Seq: 134 14:58:10 30 Nov 1999 HG
ESP0#2
Hg 7.67 ug/l .000 7.67
$\bar{x}$ = 7.68 ug/l X 0.100 l = (0.768 ug)

*** Sample ID: 1384172 Seq: 135 15:00:30 30 Nov 1999 HG
ESP0#2
Hg 7.70 ug/l .000 7.70

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

see dilution Below.

*** Sample ID: 1384177 Seq: 136 15:02:48 30 Nov 1999 HG
ESPO #3
Hg 21.3 ug/l .000 21.3
11/30/99 gp

*** Sample ID: 1384177 Seq: 137 15:05:18 30 Nov 1999 HG
ESPO #3
Hg 21.6 ug/l .000 21.6

*** Sample ID: 1384182 Seq: 138 15:08:00 30 Nov 1999 HG
<0.2 ESPO ~~#4~~ BT
Hg -.002 ug/l .000 -.002
$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1384182 Seq: 139 15:10:07 30 Nov 1999 HG
<0.2 ESPO ~~#4~~ BT
Hg .006 ug/l .000 .006

*** Sample ID: NIST Seq: 140 15:14:23 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .641 ug/l .000 .641
Acid washed filter before analysis. - forgot to dump acid water before filtering. 11/30/99 gp

*** Sample ID: NIST Seq: 141 15:16:28 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .646 ug/l .000 .646

*** Sample ID: NIST Refiltered 0.52g/100ml Seq: 142 15:22:40 30 Nov 1999 HG 2% difference
COAL FLY ASH #1633B
Hg .742 ug/l .000 .742
$\bar{x}$ = 0.735 ug/l x $\frac{0.100 l}{0.52 g}$ = 0.141 ug/g
T.V. = 0.141 ± 0.019 ug/g

*** Sample ID: NIST Seq: 143 15:24:45 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .728 ug/l .000 .728

Confirmation only.

*** Sample ID: 1384095 Seq: 144 15:28:15 30 Nov 1999 HG
FGD-2 INLET
Hg 1.17 ug/l .000 1.17
$\bar{x}$ = 1.17 ug/l x 0.100 l = 0.117 ug

*** Sample ID: 1384095 Seq: 145 15:30:21 30 Nov 1999 HG
FGD-2 INLET
Hg 1.16 ug/l .000 1.16

*** Sample ID: 1384177 Seq: 146 15:32:45 30 Nov 1999 HG
esp #3 1:10 dilution
Hg 2.47 ug/l .000 2.47
$\bar{x}$ = 2.47 ug/l x 0.100 l x 10 = 2.47 ug

*** Sample ID: 1384177 Seq: 147 15:34:57 30 Nov 1999 HG
esp #3 1:10
Hg 2.47 ug/l .000 2.47

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 148 15:37:09 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		96.9	4.85 ✓	5.00	ug/l	.000

$\bar{x}$ = (4.87 ug/l) (97% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 149 15:39:31 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.7	4.89 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 150 15:41:53 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-31100	-.031	.000	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 151 15:44:02 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.019	.200	ug/l	.000

Projects # 187900 -187901

Calculations for Total Amount of Particle-Bound Mercury (Hg_{tp}) by: (Eq. # 7)

$$Hg_{(particle),\ ug} = (Hg_{ash}) - Hg_{fb} + Hg_{pr}$$

where: Hg_{ash} = Mercury present in ash (thimble or filter), ug

Hg_{fb} = Client blk of Probe Rinse portion, ug - See 11/22/99 Data. (All client blanks were below D.L.)

Hg_{pr} = Probe Rinse, 0.1N HNO_3 results performed on 11/22/99, ug

The Hg_{ash} and Hg_{pr} portions were logged in as different sample ID # for some samples. Client notes were placed in LIMS.

(1) # 1382186 (thimble) + 1382189 (Hg pr blk) (Inlet SB)

< 0.02 ug Hg(ash) + < 0.084 ug Hg_{pr} = (< 0.08 ug Hg particle)

(2) # 1382224 thimble + 1382227 Probe Rinse (STACK SB)

< 0.02 ug Hg_{ash} + < 0.046 ug Hg_{pr} = (< 0.05 ug Hg particle)

(3) # 1382157 (ID for thimble + Probe rinse) (Outlet #1)

< 0.02 ug + < 0.076 ug = (< 0.08 ug Hg part)

(4) # 1382161 (ID for thimble + Probe Rinse) (Outlet #2)

< 0.02 ug + < 0.048 ug = (< 0.048 ug Hg)

(5) # 1382165 (ID for thimble + Probe Rinse) (Outlet # 3)

< 0.02 ug + < 0.051 ug = (< 0.051 ug Hg part)

(6) 1382169 (ID for Thimble + Probe Rinse) (Outlet RT)

< 0.02 ug + < 0.021 ug = (< 0.02 ug Hg part.)

Total Particle-Bound Mercury con't.

(7) # 1382173 (Inlet #1)

< 0.02 ug Hg ash + 0.089 ug Hg pr = 0.089 ug Hg part

(8) 1382177 (Inlet #2)

< 0.02 ug Hg ash + < 0.025 ug Hg pr = < 0.025 ug Hg part.

(9) 1382181 (Inlet #3)

< 0.02 ug Hg ash + < 0.031 ug Hg pr = < 0.031 ug Hg part.

(10) 1382190 (Inlet BT)

< 0.02 ug Hg ash + < 0.027 ug Hg pr = < 0.027 ug Hg part.

(11) 1382211 (Stack #1)

< 0.02 ug Hg ash + < 0.015 ug Hg pr = < 0.02 ug Hg part

(12) 1382215 (Stack #2)

< 0.02 ug Hg ash + < 0.024 ug Hg pr = < 0.02 ug Hg part

(13) 1382219 (Stack #3)

< 0.02 ug Hg ash + < 0.018 ug Hg pr = < 0.02 ug Hg part

(14) 1382228 (Stack BT)

< 0.02 ug Hg ash + < 0.024 ug Hg pr = < 0.02 ug Hg part

PJs# 187900
187901

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Analyte	QCS			IPC/CCV				
	True	Found	%R	True	Found	%R	Found	%R
Mercury	5.00	4.82	96.4	5.00	5.10	102.0	5.11	102.2

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	5.09	101.8	5.05	101.0	4.98	99.6

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.93	98.6	4.93	98.6	4.91	98.2

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

2A

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.96	99.2	4.90	98.0	4.85	97.0
						rms	2/25/98
						rms	5/20/98

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.78	95.6	4.79	95.8	4.69	93.8
						rms	2/25/98
						rms	5/20/98

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Analyte				IPC/CCV True	Found	%R	Found	%R
Mercury				5.00	4.72	94.4	4.69	93.8

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name *Philip Analytical Services*

File Name *HG-112299*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#5		#6	c	#7	c	#8	c	#9	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#10		#11	c	#12	c	#13	c	#14	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20							

5/19/98 rms

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 H2O2

	1382226
	Method Blank
	ug
Mercury	< 0.21

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *111999 0.1N HNO3*

	1382227
	Method Blank
	(ug)
Mercury	< 0.084

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 KCL

	1382223
	Method Blank
	(ug)
Mercury	< 0.14

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 KMNO4

	1382225
	Method Blank
	ug
Mercury	< 0.02

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *10% HNO3 INLET*

	1382195
	Method Blank
	(ug)
Mercury	< 0.06

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 10% HNO3 STACK

	1382232
	Method Blank
	(ug)
Mercury	< 0.04

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *111999 H2O2*

	1382188
	Method Blank
	(ug)
Mercury	< 0.28

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 0.1N HNO3

	1382189
	Method Blank
	ug
Mercury	< 0.084

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *111999 KCL*

	1382185
	Method Blank
	(ug)
Mercury	< 0.14

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 KMNO4

	1382187
	Method Blank
	(ug)
Mercury	< 0.14

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 H2O2

Sample Number: *1382183*

Concentration Units:ug Hg

		Matrix Spike									
	Sample	Spike	Matrix Spike								
Parameter	Conc.	Conc.	Conc.	% Recovery	c						
Mercury	0.684	1.68	2.20	90.0							

5/20/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 0.1N HNO3

Sample Number: *1382165*

Concentration Units: ug Hg

		MATRIX SPIKE									
	Sample	Spike	Matrix Spike								
Parameter	Conc.	Conc.	Conc.	% Recovery	c						c
Mercury	< 0.051	0.506	0.435	86.0							

5/19/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382223*

Concentration Unit: ug Hg

		MATRIX SPIKE									
	Sample	Spike	Matrix Spike								
Parameter	Conc.	Conc.	Conc.	% Recovery	c						c
Mercury	< 0.14	1.40	1.36	97.0							

5/20/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382212*

Concentration Units: ug Hg

		MATRIX SPIKE									
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c						c
Mercury	0.819	1.95	2.72	97.0							

5/19/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KMNO4

Sample Number: *1382176*

Concentration Units:ug Hg

		Matrix Spike									
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c						
Mercury	5.84	1.38	7.29	104.0							

5/20/98 rms

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 H2O2

Sample Number: *1382183*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	0.684	0.683	0.678	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 0.1N HNO3

Sample Number: *1382165*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.051	< 0.051	< 0.051	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382223*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.14	< 0.14	< 0.14	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382212*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	0.819	0.828	0.832	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KMNO4

Sample Number: *1382176*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	5.84	5.87	5.82	

Must be within 10 % difference

rms 5/20/1998

Metal PQLS

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*

Element	Water PQL (ug/l)	Soil PQL (ug/g)
Mercury	< 0.20	< 0.04

PQLs
rms 5/21/98

~~183321~~
187900
& 187901

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*

Concentration Units: ug/l

Analyte	QCS			IPC/CCV				
	True	Found	%R	True	Found	%R	Found	%R
Mercury	5.00	5.00	100.0	5.00	5.09	101.8	5.15	103.0

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.75	95.0	4.83	96.6	4.95	99.0

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.91	98.2	4.98	99.6	4.98	99.6

rms 2/25/98 rev. 1
rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.87	97.4		#VALUE!		

rms 2/25/98
rms 5/20/98

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-113099*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name *Philip Analytical Services*

File Name *HG-113099*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#5		#6	c	#7	c	#8	c	#9	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*
Batch: 112999A ASH

	1382224
	Method Blank
	ug
Mercury	< 0.02

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*
Batch: *112999A ASH*

	1382186
	Method Blank
	(ug)
Mercury	< 0.02

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-113099* Batch: 112999A ASH

Sample Number: *1382177*

Concentration Units:ug Hg

		Matrix Spike									
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c						
Mercury	< 0.02	0.20	0.194	97.0							

5/20/98 rms

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-113099* Batch: 112999A ASH

Sample Number: *1382177*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.02	< 0.02	< 0.02	

Must be within 10 % difference

rms 5/20/1998

Metal PQLS

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*

Element	Water PQL (ug/l)	Soil PQL (ug/g)
Mercury	< 0.20	< 0.04

PQLs
rms 5/21/98

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON

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Client	SMEPA, R. D. MORROW		
Work Order Number	11634.001.002	Phone Number	610-701-7245
Contact Person	Jack Mills	Turn Around Time	Standard

Analyses Requested/Other Info

Lab ID	Field Sample ID	Sample Collection Date	Analysis	Post weight		FILTER FD #	Sample Check-off
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - FHHNO3	10/27/99	OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - FILT		OHM	X		W207	✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - FHHNO3	10/28/99	OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - FILT		OHM	X		W208	✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - FHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - FILT		OHM	X		W209	✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	[redacted]						
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - FHHNO3	10/28/99	OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - FILT		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHKMNO		OHM				✓

Notes: OHM - Speciated Mercury Analysis per Ontario Hydro Method

Post weight is for Mercury Determination as per ontario Hydro Method

Relinquished By	Received By	Date	Time	Lab Use Only	
[illegible]	Tyson Belkyng	11/4/99	10:45	Shipper	Air Bill #
	[illegible]			Opened By	Date/Time
Tyson Belkyng	D. Dattel	11/8/99	11:05 Am	Temp °C	Condition
[illegible]	J. Mast	11/8/99	14:30	Custody Seals: Yes No None N/A	

Laboratory Comments:

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Metal PQLS

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*

Element	Water PQL (ug/l)	Soil PQL (ug/g)
Mercury	< 0.20	< 0.04

PQLs
rms 5/21/98

Lab Tracking Number

18 7100

WESTON

Chain-of-Custody Record/Lab Work Request

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Client	SMEPA, R. D. MORROW		
Work Order Number	11634.001.002	Phone Number	610-701-7245
Contact Person	Jack Mills	Turn Around Time	Standard

Analyses Requested/Other Info

Lab ID	Field Sample ID	Sample Collection Date	Analysis	Post weight		FILTER FD #	Sample Check-off
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - FHHNO3	10/27/99	OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - FILT		OHM	X		W207	✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 1 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - FHHNO3	10/28/99	OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - FILT		OHM	X		W208	✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 2 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - FHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - FILT		OHM	X		W209	✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - 3 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	~~SMEPA - U2 FGD - OUT - SB - OHM - 26OCT1999 - KCL~~		~~OHM~~				
	~~SMEPA - U2 FGD - OUT - SB - OHM - 26OCT1999 - FILT~~		~~OHM~~				
	~~SMEPA - U2 FGD - OUT - SB - OHM - 26OCT1999 - KMNO4~~		~~OHM~~				
	~~SMEPA - U2 FGD - OUT - SB - OHM - 26OCT1999 - HNO3/H2~~		~~OHM~~				
	~~SMEPA - U2 FGD - OUT - SB - OHM - 26OCT1999 - HNO3~~		~~OHM~~				
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - FHHNO3	10/28/99	OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - FILT		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - OUT - BT - OHM - 26OCT1999 - BHKMNO		OHM				✓

Notes: OHM - Speciated Mercury Analysis per Ontario Hydro Method

Post weight is for Mercury Determination as per ontario Hydro Method

Relinquished By	Received By	Date	Time	Lab Use Only	
[illegible]	Tyson Bellkyng	11/4/99	10:45	Shipper	Air Bill #
	[illegible]			Opened By	Date/Time
Tyson Bellkyng	D. Dartsch	11/8/99	11:05 Am	Temp °C	Condition
[illegible]	J. Mast	11/8/99	14:30	Custody Seals: Yes No None N/A	

Laboratory Comments:

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Lab Tracking Number

18T100

Chain-of-Custody Record/Lab Work Request

WESTON

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Client	SMEPA, R. D. MORROW		
Work Order Number	11634.001.002	Phone Number	610-701-7245
Contact Person	Jack Mills	Turn Around Time	Standard

Analyses Requested/Other Info

Lab ID	Field Sample ID	Sample Collection Date	Analysis	Post weight		Filter or Thimble ID	Sample Check-off
	SMEPA - U2 FGD - IN - 1 - OHM - 26OCT1999 - FHHNO3	10/27/99	OHM				✓
	SMEPA - U2 FGD - IN - 1 - OHM - 26OCT1999 - FILT		OHM	X		W-1	✓
	SMEPA - U2 FGD - IN - 1 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - IN - 1 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - 1 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - IN - 2 - OHM - 26OCT1999 - FHHNO3	10/28/99	OHM				✓
	SMEPA - U2 FGD - IN - 2 - OHM - 26OCT1999 - FILT		OHM	X		W-3	✓
	SMEPA - U2 FGD - IN - 2 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - IN - 2 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - 2 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - IN - 3 - OHM - 26OCT1999 - FHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - 3 - OHM - 26OCT1999 - FILT		OHM	X		W 2	✓
	SMEPA - U2 FGD - IN - 3 - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - IN - 3 - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - 3 - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - KCl		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - FILT		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - KMNO4		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - HNO3/H2O2		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - HNO3		OHM				✓
	SMEPA - U2 FGD - IN - BT - OHM - 26OCT1999 - FHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - BT - OHM - 26OCT1999 - FILT		OHM				✓
	SMEPA - U2 FGD - IN - BT - OHM - 26OCT1999 - BHKCL		OHM				✓
	SMEPA - U2 FGD - IN - BT - OHM - 26OCT1999 - BHHNO3		OHM				✓
	SMEPA - U2 FGD - IN - BT - OHM - 26OCT1999 - BHKMNO4		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - Thimble		OHM				✓
	SMEPA - U2 FGD - IN - SB - OHM - 26OCT1999 - 10% HNO3		OHM				✓

Notes: OHM - Speciated Mercury Analysis per Ontario Hydro Method

Post weight is for Mercury Determination as per Ontario Hydro Method

Relinquished By	Received By	Date	Time	Lab Use Only	
[illegible]	Tyson Balkrage	11/4/99	10:45	Shipper	Air Bill #
	Tyson Balkrage			Opened By	Date/Time
Tyson Balkrage	D. Bartsch	11/8/99	11:05 pm	Temp °C	Condition
	J. Mast	11/8/99	14:30	Custody Seals: Yes No None N/A	

Laboratory Comments:

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APPENDIX E
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS
Unit No. 2 – FGD Inlet
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 29.74\ in.\ Hg + \frac{0.91\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 29.81\ in.\ Hg$$

Absolute Stack Gas Pressure (Ps), in. Hg

$$Ps = Pb + \frac{Pg}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
Pg = Static Pressure, in. H_2O

$$Ps = 29.74\ in.\ Hg + \frac{-16.50\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 28.53\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647\ °R/in.\ Hg\ x\ Y\ x\ Vm\ x\ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, dscf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.647\ °R/in.\ Hg\ x\ 0.9979\ x\ 74.172\ dscf\ x\ 29.81\ in.\ Hg}{549\ °R} = 70.89\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707\ ft^3/mL\ x\ Vlc$$

where, Vlc = volume of H_2O collected, mL from impingers and silica gel

$$Vwstd = 0.04707\ ft^3/mL\ x\ 130\ mL = 6.1\ scf$$

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.647 \frac{°R}{in.Hg} \times Qa \times (1 - Bws) \times \frac{Ps}{Ts}$$

where, Qa = average stack gas flow at stack conditions, ft^3/min
Bws = moisture content (dimensionless)
Ps = absolute stack gas pressure, in. Hg
Ts = absolute stack temperature, °R

$$Qs = 17.647 \frac{°R}{in.Hg} \times 4.45\,E+05 \frac{acf}{min} \times (1 - 0.079) \times \frac{28.53\,in.Hg}{790°R} = 2.61\,E+05\ dscfm$$

Recalculated Inlet Flow Rate, dscfm

$$VFR = Stack\ VFR, dscfm \times \left(\frac{21 - Stack\ O_2}{21 - Inlet\ O_2} \right)$$

$$VFR = 512020 \times \left(\frac{21 - 7.6}{21 - 7.3} \right)$$

$$VFR = 500808$$

Percent Isokinetic Sampling Rate (%I)

$$\%I = \frac{0.0945(in.Hg)(min)/(°R)(sec) \times Ts \times Vmstd}{Ps \times Vs \times An \times \Theta \times (1 - Bws)}$$

where, Ts = avg. stack temperature, °R
Vmstd = standard meter volume, dscf
Ps = absolute stack gas pressure, in. Hg
Vs = stack gas velocity, ft/sec
An = cross-sectional area of nozzle, ft^2
Θ = total sampling time, min
Bws = moisture content (dimensionless)

$$\%I = \frac{0.0945(in.Hg)(min)/(°R)(sec) \times 790°R \times 70.89\,dscf}{28.53\,in.Hg \times 74.2\,ft/sec \times 2.1\,E-0.4\,ft^2 \times 125\,min \times (1 - 0.079)}$$

$$\%I = 103.7$$

Total Mercury Mass Emission Rate, lbs/hr

$$MR1 = C_1 \times Qs(std) \times 60$$

$$MR1 = 7.26\,E-10 \times 500808 \times 60$$

$$MR1 = 2.18\,E-02$$

where, MR1 = total mercury mass emission rate, lbs/hr
60 = conversion factor from minutes to hours

Total Mercury Mass Emission Rate, lbs/10E+12 Btu

$$MR2 = MR1/Heat\ Input$$

$$MR2 = 2.18\,E-02 / 2058$$

$$MR2 = 10.60$$

where, MR2 = total mercury mass emission rate, lbs/10E+12 Btu
Heat Input = 2058 x 10E+6 Btu/hr

Mercury Emissions from Coal Feed, lb/hr

$$Hg\,(lb/hr) = < 0.10 \frac{mg}{Kg} \times \frac{Kg}{2.2046\,lb} \times 159{,}605 \frac{lb}{hr} \times \frac{g}{1000\,mg} \times \frac{lb}{454\,g}$$

$$Hg\,(lb/hr) = < 0.0159\ lbHg/hr$$

where, <0.10 mg/Kg = coal analysis analytical result
159,605 lb/hr = coal feed rate

APPENDIX F
EQUIPMENT CALIBRATION RECORDS

POST-TEST EQUIPMENT CALIBRATIONS

Client SMEPA Work Order No. 11634-001.002 Due Date 3FEB00

Test Team Leader TWR Test Dates 27,

Probe No.____ Avg. Stack Temp.____

Probe No.____ Avg. Stack Temp.____

Probe No.____ Avg. Stack Temp. 333

Probe No.____ Avg. Stack Temp. 182

Pitot Tube No. P302

Pitot Tube No. P137

Pitot Tube No.____

Pitot Tube No.____

Meter Box No. ~~A~~ 8	Highest Vacuum 5.5	Avg. ΔH 0.91
Meter Box No. W15	Highest Vacuum 7.0	Avg. ΔH 1.7
Meter Box No.____	Highest Vacuum____	Avg. ΔH____
Meter Box No.____	Highest Vacuum____	Avg. ΔH____

Singer DGM No.____ Flow Rate____

Singer DGM No.____ Flow Rate____

Singer DGM No.____ Flow Rate____

Singer DGM No.____ Flow Rate____

VOST Box No.____ Flow Rate____

VOST Box No.____ Flow Rate____

VOST Box No.____ Flow Rate____

VOST Box No.____ Flow Rate____

HH Thermocouple No.____ Avg. Temp.____

HH Thermocouple No.____ Avg. Temp.____

HH Thermocouple No.____ Avg. Temp.____

HH Thermocouple No.____ Avg. Temp.____

Rotameter No.____

Rotameter No.____

Rotameter No.____

Rotameter No.____

Post-Test Meter Check

SMEPA
Hattiesburg, MS

11634-001-002
Unit 2 Inlet

Meter ID: Meter No.8

Run Number		1	2	3	Mean
Sampling Time, min	(Theta)	125	125	125	125
Meter Volume, ft^3	(Vm)	74.172	70.821	73.892	72.962
Meter Temperature, R	(tm)	549	549	561	553
Barometric Pressure, in. Hg	(Pb)	29.74	29.80	29.80	29.78
Meter Orifice Pressure, in. H_2O	(dH)	0.914	0.924	1.000	0.946
Meter Pressure, in. Hg	(Pm)	29.81	29.87	29.87	29.85
Ave Sq Rt Meter Orifice Pressure, in. H_2O	((sqrt. dH)ave.	0.954	0.960	0.999	0.971
Meter Orifice Calibraion Coefficient, in. H_2O	(dH@)	1.6955	1.6955	1.6955	1.696
Dry Mol. Wt. of Stack Gas, lb/lb-mole	(Md)	30.08	30.08	30.08	30.08
Dry Gas Meter Cal. Check Value	(Yqa)	0.9289	0.9786	0.9865	0.9647
Meter Correction Factor	(Y)	0.9979	0.9979	0.9979	0.9979
Mean Percent Difference, %	< +/- 5%				-3.33

WESTON

LONG/PRE DRY GAS METER CALIBRATION DATA FORM

Calibrator [signature]

Date 10/08/99 Meter Box Number 8 Plant _____

Barometric pressure, P_b = 29.78 in. Hg Dry Gas Meter Number 6842672 Comments _____

Setting	Gas volume		Temperatures						
Orifice manometer	Wet test meter	Dry gas meter	Wet test meter	Dry gas meter					
(Δ H) in. H_2O	(V_w) ft³	(V_d) ft³	(t_w) °F	Inlet (td_i) °F	Outlet (td_o) °F	Avg (t_d) °F	Time (Θ), min	Y_i	$\Delta H @_i$ in. H_2O
0.5	5	82.025 76.945	71	81, 84	80, 80	81	11.9	.9996	1.5713
1.0	5	87.128 82.025	71	84, 87	80, 82	83	8.6	.9995	1.6352
1.5	10	97.372 87.128	71	85, 90	81, 83	85	14.5	.9982	1.7368
2.0	10	107.672 97.372	71	90, 93	84, 85	88	12.7	.9970	1.7668
3.0	10	118.020 107.672	71	94, 96	86, 87	91	10.4	.9954	1.7675
							Avg	Y .9979	Δ H @ 1.6955

If there is only one thermometer on the dry gas meter, record the temperature under td_o.

(ΔH) in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H @ i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\Theta}{V_w}\right]^2$
0.5	0.0368	(5)(29.78)(81+460) / (5.08)(29.78+.0368)(71+460)	(.0317)(.5) / (29.78)(81+460) [(71+460)(11.9) / 5]²
1.0	0.0735	(5)(29.78)(83+460) / (5.103)(29.78+.0735)(71+460)	(.0317)(1.0) / (29.78)(83+460) [(71+460)(8.6) / 5]²
1.5	0.110	(10)(29.78)(85+460) / (10.244)(29.78+.110)(71+460)	(.0317)(1.5) / (29.78)(85+460) [(71+460)(14.5) / 10]²
2.0	0.147	(10)(29.78)(88+460) / (10.300)(29.78+.147)(71+460)	(.0317)(2.0) / (29.78)(88+460) [(71+460)(12.7) / 10]²
3.0	0.221	(10)(29.78)(91+460) / (10.348)(29.78+.221)(71+460)	(.0317)(3.0) / (29.78)(91+460) [(71+460)(10.4) / 10]²

WESTON

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

DATE 10/08/99
AMBIENT TEMPERATURE 71
CALIBRATION Pitot

POTENTIOMETER NUMBER 2010 # 8
BAROMETRIC PRESSURE 29.78
REFERENCE: THERMOCOUPLE SIMULATOR (ACCURACY ± 1°F)

REFERENCE TEMPERATURE °C	REFERENCE TEMPERATURE °F	TEMPERATURE READING FROM THERMOCOUPLE CHANNEL INPUT NUMBER 1	2	3	4	5	AVERAGE TEMPERATURE READING ②	TEMPERATURE DIFFERENCE ③ (%)
0	32	32	32	32	32	32	32	0°—0%
100	212	214	214	214	214	214	214	2°—.30%
500	932	934	934	934	934	934	934	2°— .14%
1000	1832	1831	1831	1831	1831	1831	1831	1°— .04%

COMMENTS

② AVERAGE TEMPERATURE READING = MEAN OF THE TEMPERATURE READINGS FOR THE THERMOCOUPLE CHANNELS

③ THE CHANNEL READINGS MUST AGREE WITHIN ± 5°F OR 3°C

ACCEPTABLE TEMPERATURE DIFFERENCE ≤ 1.5 = $\left(\frac{(\text{REF TEMP}^{\circ}\text{F} + 460) - (\text{TEST TEMP}^{\circ}\text{F} + 460)}{(\text{REF TEMP}^{\circ}\text{F} + 460)}\right) \times 100$

WESTON

LONG/PEE DRY GAS METER CALIBRATION DATA FORM

Calibrator P. Mack

Date 9/27/99 Meter Box Number 15 Plant

Barometric pressure, P_b = 29.63 in. Hg Dry Gas Meter Number ~~1348735~~ 1348735 Comments

Setting	Gas volume		Temperatures						
Orifice manometer	Wet test meter	Dry gas meter	Wet test meter	Dry gas meter					
(ΔH) in. H_2O	(V_w) ft^3	(V_d) ft^3	(t_w) °F	Inlet (t_{d_i}) °F	Outlet (t_{d_o}) °F	Avg (t_d) °F	Time (θ), min	Y_i	$\Delta H@_i$ in. H_2O
0.5	5	302.253 297.222	71.5	78,79,79	76,76,77	77.5	13.0	1.004	1.8914
1.0	5	307.329 302.253	71.5	79,80,81	76,77,77	78.5	9.4	.9935	1.9836
1.5	10	317.564 307.329	71.5	81,83,84	78,78,79	80.5	15.8	.9957	2.0938
2.0	10	327.724 317.504	71.5	83,84,86	79,79,80	82	13.8	.9932	2.1238
3.0	10	337.990 327.721	71.5	86,91,92	80,81,82	85.5	11.2	.9921	2.0849
							Avg	$\bar{Y}$ .9961	$\Delta H@$ 2.0355

If there is only one thermometer on the dry gas meter, record the temperature under td_i.

(ΔH) in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H@_i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\theta}{V_w}\right]^2$
0.5	0.0368	$\frac{(5)(29.63)(77.5+460)}{(5.031)(29.63+.0368)(71.5+460)}$	$\frac{(.0317)(.5)}{(29.63)(77.5+460)}\left[\frac{(71.5+460)(13.0)}{5}\right]^2$
1.0	0.0735	$\frac{(5)(29.63)(78.5+460)}{(5.076)(29.63+.0735)(71.5+460)}$	$\frac{(.0317)(1.0)}{(29.63)(78.5+460)}\left[\frac{(71.5+460)(9.4)}{5}\right]^2$
1.5	0.110	$\frac{(10)(29.63)(80.5+460)}{(10.175)(29.63+.110)(71.5+460)}$	$\frac{(.0317)(1.5)}{(29.63)(80.5+460)}\left[\frac{(71.5+460)(15.8)}{10}\right]^2$
2.0	0.147	$\frac{(10)(29.63)(82+460)}{(10.217)(29.63+.147)(71.5+460)}$	$\frac{(.0317)(2.07)}{(29.63)(82+460)}\left[\frac{(71.5+460)(13.8)}{10}\right]^2$
3.0	0.221	$\frac{(10)(29.63)(85.5+460)}{(10.269)(29.63+.221)(71.5+460)}$	$\frac{(.0317)(3.0)}{(29.63)(85.5+460)}\left[\frac{(71.5+460)(11.2)}{10}\right]^2$

Post-Test Meter Check

SMEPA
Hattiesburg, MS

11634-001-002
Unit 2 Outlet

Meter ID: Meter No.15

Run Number		1	2	3	Mean
Sampling Time, min	(Theta)	120	120	120	120
Meter Volume, ft^3	(Vm)	72.922	72.823	70.609	72.118
Meter Temperature, R	(tm)	555	547	555	552
Barometric Pressure, in. Hg	(Pb)	29.74	29.80	29.80	29.78
Meter Orifice Pressure, in. H_2O	(dH)	1.265	1.310	1.170	1.248
Meter Pressure, in. Hg	(Pm)	29.83	29.90	29.89	29.87
Ave Sq Rt Meter Orifice Pressure, in. H_2O	((sqrt. dH)ave.	1.123	1.142	1.079	1.114
Meter Orifice Calibraion Coefficient, in. H_2O	(dH@)	2.0355	2.0355	2.0355	2.036
Dry Mol. Wt. of Stack Gas, lb/lb-mole	(Md)	30.08	30.08	30.08	30.08
Dry Gas Meter Cal. Check Value	(Yqa)	0.9795	0.9890	0.9714	0.9800
Meter Correction Factor	(Y)	0.9961	0.9961	0.9961	0.9961
Mean Percent Difference, %	< +/- 5%				-1.62

WESTON

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

DATE 7/24/99
AMBIENT TEMPERATURE 72
CALIBRATION [illegible]

POTENTIOMETER NUMBER 2010 #15
BAROMETRIC PRESSURE 29.27
REFERENCE: THERMOCOUPLE SIMULATOR (ACCURACY = 1°F)

REFERENCE TEMPERATURE °C	°F	TEMPERATURE READING FROM THERMOCOUPLE CHANNEL INPUT NUMBER 1	2	3	4	5	AVERAGE TEMPERATURE READING ①	TEMPERATURE DIFFERENCE ② (%)
0	32	31	31	31	31	31	31	1° - .20%
100	212	212	212	212	212	212	212	0° - 0%
500	932	933	933	933	933	933	933	1° - ~~[illegible]~~ .07%
1000	1832	1830	1830	1830	1830	1830	1830	2° - .09%

COMMENTS

① AVERAGE TEMPERATURE READING = MEAN OF THE TEMPERATURE READINGS FOR THE THERMOCOUPLE CHANNELS

② THE CHANNEL READINGS MUST AGREE WITHIN ± 5°F OR 3°C

ACCEPTABLE TEMPERATURE DIFFERNCE ≤ 1.5 = $\left(\frac{(\text{REF TEMP}^\circ\text{F} + 460) - (\text{TEST TEMP}^\circ\text{F} + 460)}{(\text{REF TEMP}^\circ\text{F} + 460)}\right) \times 100$

PITOT TUBE IDENTIFICATION NUMBER: D137

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE ASSEMBLY LEVEL? ✓ (YES) _____ (NO)

PITOT TUBE OPENINGS DAMAGED? _____ (YES-EXPLAIN BELOW) ✓ (NO)

α_1 = 0° (<10) α_2 = 0° (<10)

β_1 = 0° (<5) β_2 = 0° (<5)

γ = 1° θ = 0° A = .93 in.

z = A sin γ = .01 in.; (<1/8 in.),

w = A sin θ = 0 in.; (<1/32 in.),

P_a = .465 in. P_b = .465 in.

D_t = .36 in. $P_a = P_b$? ✓ (YES) _____ (NO)

COMMENTS _____

CALIBRATION REQUIRED? _____ (YES) ✓ (NO)

INSPECTOR Tom Burg DATE 12-22-98

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WESTON.

PITOT TUBE IDENTIFICATION NUMBER: P-30

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE ASSEMBLY LEVEL? ✓ (YES) _____ (NO)

PITOT TUBE OPENINGS DAMAGED? _____ (YES-EXPLAIN BELOW) ✓ (NO)

α_1 = 0° (< 10) α_2 = 0° (< 10)

β_1 = 0 (< 5) β_2 = 0° (< 5)

γ = 1° θ = 0 A = .83 in.

$P_a - A_1$ = .01 in.; (< 1/8 in.)

w = A sinθ = 0 in.; (< 1/32 in.),

P_a = .465 in. P_b = .465 in.

P_1 = .38 in. $P_a = P_b$? _____ (YES) _____ (NO)

COMMENTS 1 Bin head

CALIBRATION REQUIRED? _____ (YES) ✓ (NO)

[illegible] John Gallagher DATE 9/10/99

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POST-TEST EQUIPMENT CALIBRATIONS

Client SMeDA Work Order No. 11634-001-002 Due Date _____

Test Team Leader JACKSHORT Test Dates 10/24/99 + 10/29/99

Probe No. PR48	Avg. Stack Temp. 1903	62.61
Probe No. _____	Avg. Stack Temp. _____	
Probe No. _____	Avg. Stack Temp. _____	
Probe No. _____	Avg. Stack Temp. _____	

✓ Pitot Tube No. AVP93		
Pitot Tube No. _____		
Pitot Tube No. _____		
Pitot Tube No. _____		

Meter Box No. A04	Highest Vacuum 12	Avg. ΔH 1.8597
Meter Box No. A06	Highest Vacuum 6	Avg. ΔH 1.6545
Meter Box No. _____	Highest Vacuum _____	Avg. ΔH _____
Meter Box No. _____	Highest Vacuum _____	Avg. ΔH _____

Singer DGM No. _____	Flow Rate _____
Singer DGM No. _____	Flow Rate _____
Singer DGM No. _____	Flow Rate _____
Singer DGM No. _____	Flow Rate _____

VOST Box No. _____	Flow Rate _____
VOST Box No. _____	Flow Rate _____
VOST Box No. _____	Flow Rate _____
VOST Box No. _____	Flow Rate _____

HH Thermocouple No. _____	Avg. Temp. _____
HH Thermocouple No. _____	Avg. Temp. _____
HH Thermocouple No. _____	Avg. Temp. _____
HH Thermocouple No. _____	Avg. Temp. _____

Rotameter No. _____

Rotameter No. _____

Rotameter No. _____

Rotameter No. _____

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in outlined boxes below, other columns are automatically calculated.

DATE: 9/13/99 | METER SERIAL #: | BAROMETRIC PRESSURE (in Hg): INITIAL 29.4, FINAL 29.4, AVG (P_{bar}) 29.40

METER PART #: AO4 | CRITICAL ORIFICE SET SERIAL #: 13315 | Calibrated by:

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	AMBIENT F°	DGM F° INITIAL	DGM F° FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH ($in\ H_2O$)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
12	1	0.3359	24	523.819	534.189	10.370	90.9	95.7	95.5	95.6	23.0	0.55	9.698	9.68	0.998	1.747
16	2	0.4418	22.5	425.481	435.528	10.047	86.9	93.3	93.8	93.6	17.0	1.00	9.442	9.445	1.000	1.822
19	3	0.5188	21	448.315	461.525	13.210	89.7	94.8	96.9	95.9	19.0	1.40	12.375	12.364	0.999	1.860
25	4	0.6885	19	477.731	487.975	10.244	90.8	99.2	99.6	99.4	11.0	2.40	9.559	9.49	0.993	1.814
31	5	0.8376	16.5	505.340	516.620	11.280	90.9	101.2	99.7	100.5	10.0	3.80	10.543	10.495	0.995	1.941
														AVG =	0.997	1.837

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:

The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

Individual Y's .02 from average? YES

Individual $\Delta H_@$ values 0.2 from average? YES

(1) $V_m\ (std) = K_1\ V_m \dfrac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}\ (std) = K' \sqrt{\dfrac{P_{bar}\,\theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \dfrac{V_{cr}\ (std)}{V_m\ (std)}$ = DGM calibration factor

(4) $\Delta H_@ = \left(\dfrac{0.75\,\theta}{V_{cr}(std)}\right)^2 \Delta H$

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in outlined boxes below, other columns are automatically calculated.

DATE: 2/10/99 | METER SERIAL #: | BAROMETRIC PRESSURE (in Hg): INITIAL 29.42, FINAL 29.42, AVG (P_{bar}) 29.42

METER PART #: AO6 | CRITICAL ORIFICE SET SERIAL #: 13315 | Calibrated by:

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	AMBIENT F°	DGM F° INITIAL	DGM F° FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
12	1	0.3359	26	177.934	188.258	10.324	80	86	86	86.0	23.0	0.52	9.831	9.784	0.995	1.616
16	2	0.4418	24	999.248	1,031.884	32.636	72	79	81	80.0	56.0	0.86	31.450	31.567	1.004	1.522
19	3	0.5188	23	43.009	86.365	43.356	73	83	86	84.5	63.0	1.25	41.476	41.663	1.005	1.608
25	4	0.6885	21	118.512	172.438	53.926	78	89	90	89.5	59.0	2.20	51.239	51.539	1.006	1.622
31	5	0.8376	19	977.372	990.495	13.123	72	80	82	81.0	12.0	3.40	12.703	12.824	1.010	1.675
														AVG =	1.004	1.609

Individual Y's .02 from average? YES

Individual $\Delta H_@$ values 0.2 from average? YES

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:

The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

(1) $V_m\,(std) = K_1\, V_m \dfrac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/In. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}\,(std) = K' \sqrt{\dfrac{P_{bar}\,\theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \dfrac{V_{cr}\,(std)}{V_m\,(std)}$ = DGM calibration factor

(4) $\Delta H_@ = \left(\dfrac{0.75\,\theta}{V_{cr}(std)}\right)^2 \Delta H$

PITOT TUBE CALIBRATION

DATE 12-29-98

PITOT TUBE ID NO. P 93

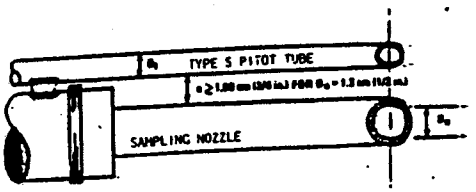
PROBE ID NO. PR 48

PITOT TUBE ASSEMBLY LEVEL? ✓ yes ____ no

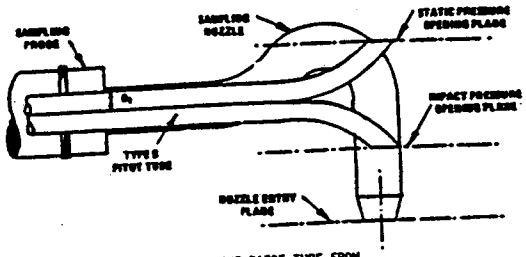
PITOT TUBE OPENINGS DAMAGED? ____ yes ✓ no

PITOT TUBE COEFFICIENT 0.84? ✓ yes ____ no

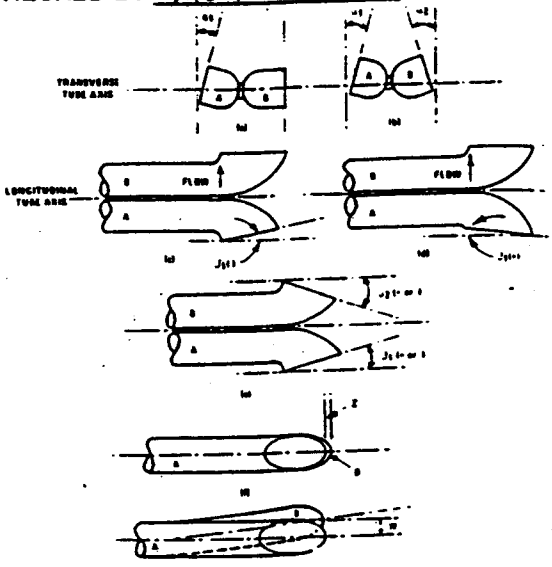
CHECKED BY MS/TS

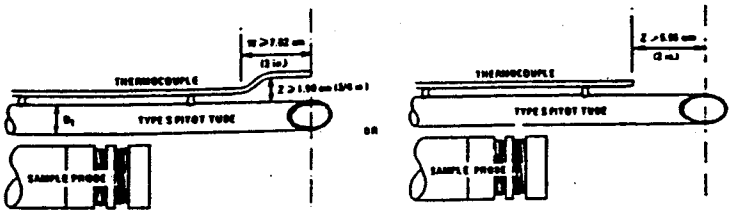


A. BOTTOM VIEW: SHOWING MINIMUM PITOT-NOZZLE SEPARATION.



B. SIDE VIEW: TO PREVENT PITOT TUBE FROM INTERFERING WITH GAS FLOW STREAMLINES APPROACHING THE NOZZLE, THE IMPACT PRESSURE OPENING PLANE OF THE PITOT TUBE SHALL BE EVEN WITH OR ABOVE THE NOZZLE ENTRY PLANE.





Proper thermocouple placement to prevent interference:
D_t between 0.48 and 0.95 cm (3/16 and 3/8 in.)

α_1 = 0 ° (<10°), α_2 = 0 ° (<10°),

β_1 = 0 ° (<5°), β_2 = 0 ° (<5°)

γ = 0 °, θ = 0 °, A = 0.871 (in.)

Z = A sin γ = 0 (in.); <0.125

w = A sin θ = 0 (in.); <0.031

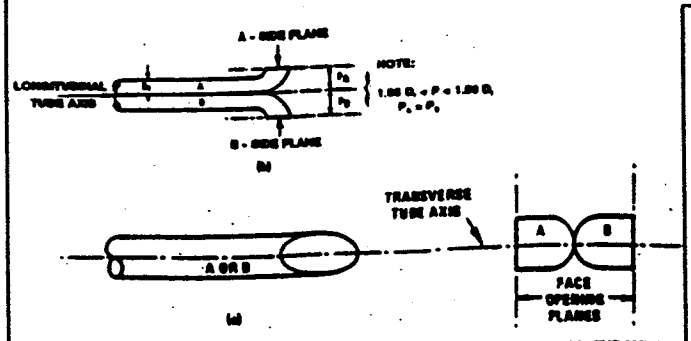
P_A 0.435 (in.) P_B 0.435 (in.)

D_t = 0.375 (in.)

X = _____ (in.); ≥0.750

Z = _____ (in.); ≥2.0

Y = _____ (in.); ≥3.0



POSTTEST CHECK

Client SMEPA

Work Order No. 11634-001-002

Date 1-3-00

Damage Found? ____ yes ✓ no

Checked by JDR

Comments _____

Page ____ of ____

5.1-M:\ADMINFORM\TAR-20.FRM TAR-20 3/91

WESTON MANAGERS DESIGNERS/CONSULTANTS

STACK TEMPERATURE SENSOR CALIBRATION DATA

Thermocouple Number: PR-48
Date: 29-Dec-98
Ambient Temperature,°F : 71
Calibrator: MS

Reference Point Number	Reference Temperature °F	Thermocouple Temperature °F	Temperature Difference %
1 - A	453	459	0.66
B	452	457	0.55
C	452	457	0.55
2 - A	71.5	72.1	0.11
B	71.4	71.5	0.02
C	71.1	71.2	0.02
3 - A	32.6	32.6	0.00
B	32.5	32.5	0.00
C	32.4	32.5	0.02

$$\text{Temp Diff (\%)} = \left| \frac{(\text{Ref Temp, °F} + 460) - (\text{Therm Tem °F} + 460)}{\text{Ref Temp,° F} + 460} \right| \times 100$$

Are all temperature differences less than +/- 1.5% ? YES

POSTTEST STACK TEMPERATURE SENSOR CALIBRATION DATA

Client: SMEPA
Work Order Number: 11634-001-002
Date: 1-31-00
Calibrator: JLR

Ambient Temp,° F	Reference Temp,° F	Thermocouple Temp,° F	Temperature Diff, %
62	62	61	0.019

Was a pretest temperature correction used ? ____yes ✓ no
Is temperature difference within +/- 1.5% ✓ yes ____no
If no, calculations done once with recorded values and once with corrected values ____

APPENDIX G
TECHNICAL SYSTEM AUDIT

PROCEDURAL CHECKLIST
FOR EPA METHODS 1, 2, 3 AND 4

METHOD 1 DETERMINATIONS

Date 10/27/99 Time _____ Operator Jobin Pathapillil Observer Mills
SMEPA Paul Green

INLET + Stack diameter properly determined? yes
Distance to nearest upstream disturbance properly determined? yes

Number of stack diameters? INLET - 4 OUTLET 8.5

Distance of nearest downstream disturbance properly determined? yes

Number of sampling points properly selected? yes
Points properly marked on pitot tube? yes
Verification of cyclonic flow acceptable? yes

METHOD 2 SAMPLING

Date 10/27/99 Time _____ Operator Jobin Pathapillil Observer _____
Paul Green Jeff Hollingsworth

Equipment identity matches pretest calibration list? yes

Pitot tube, lines, and manometer assembled correctly? yes

Pitot tube and components mounted interference-free manner? yes
Differential pressure gauge has correct sensitivity? yes

Differential pressure gauge leveled and zeroed? yes

Pretest leak check? yes Cyclonic flow checked? yes
Orientation of pitot tube correct during traverse? yes
Sampling port adequately sealed around pitot tube? yes
Process operating at correct conditions? yes
Stable reading taken at each traverse point? yes
Static pressure measured? yes Method used? Pitot tube 90° to flow and 1 leg removed
Moisture content determined? yes Method used? M4
Orsat samples taken? yes If not, explain why: _____

Post-test leak-check performed? yes Leak check results: Good
Data recorded properly? yes Calculations correct? yes

PROCEDURAL CHECKLIST
FOR EPA METHODS 1, 2, 3 AND 4

METHOD 3 SAMPLING

Date 10/27 + 10/28/97 Time SMEPA Operator Jobin P ~~Paul G~~ Observer Mills

Method: Single-point grab _____ Single-point integrated _____
Multi-point integrated yes
Is a filter used to remove particulate matter? no
Sampling train leak checked? yes
Sampling train purged with stack gas prior to collecting the sample? yes

Sampling port properly sealed? yes

Sampling rate held constant? yes

METHOD 3 ANALYSIS

Molecular weight determination by Orsat: yes

Reagents at the proper level? yes Analyzer level? yes
Analyzer leak checked? yes Analyzed within 8 hours? yes
Sample line purged? yes Complete absorption of gases? yes
The analysis repeated until following analysis criteria met? _____

CO_2 - Any three analyses differ by:

a. $\leq$ 0.3% when CO_2 $\geq$ 4.0% yes

b. $\leq$ 0.2% when CO_2 $\leq$ 4.0% _____

O_2 - Any three analyses differ by:

a. $\leq$ 0.2% when O_2 $\geq$ 15.0% _____

b. $\leq$ 0.3% when O_2 $\leq$ 14.0% yes

All readings averaged and reported to nearest 0.1% yes

TECHNICAL SYSTEM AUDIT CHECKLIST
TRACE METALS SAMPLING

Ontario Hydro Method

Date 10/27 + 10/28/99 Time _____ Operator Jobin Pathapilli Observer Mills
SMEPA Paul Green

Equipment Setup

Equipment identity matches pretest calibration list? yes

Probe nozzle: _____ Glass yes

Button-hook yes Elbow _____ Size _____

Cleaned according to sampling protocol? yes

Probe Liner: Borosilicate yes Quartz _____ Other _____

Cleaned according to sampling protocol? yes

Probe heating system: yes

Checked? _____ Temperature ~250 °F Stable? yes

Pitot Tube: Type S yes Other _____

Properly attached to probe (no interference to nozzle)? yes

Modifications: _____

Pitot tube coefficient 0.84

Differential Pressure Gauge: Inclined manometers yes

Magnehelics No Ranges 0-10"

Cylone (inlet only): Borosilicate Glass NO Other _____

Cleaned according to sampling protocol? _____

Thimble + Filter Holder: Borosilicate Glass yes Other _____

Frit material: Borosilicate Glass _____ Stainless _____

Teflon yes Other _____

Gasket Material: Silicone _____ Other VITON

Cleaned according to sampling protocol? yes

Filter Type(s): Quartz filters + Thimbles

Impinger train: Number of impingers 8

Cleaned according to sampling protocol? yes

Contents: 1st - 3rd 100 ml/IN ~~3rd~~ KCl soln ~~3rd~~ 4th - 100 ml 5% HNO_3/ 10% H_2O_2

~~4th~~ 5th - 7th 100 ml 4% $KMnO_4$ ~~5th~~ 10% H_2SO_4 6th Silica Gel

Impinger Weights recorded? yes

Cooling System ice bath

Proper connections? yes

Modifications _____

Silica Gel: Type Indicating New? _____ Used? yes

Barometer: Mercury _____ Aneroid _____ Other Electronic

Gas Density Determination: Temperature sensor yes

Pressure gauge yes

Temperature sensor properly attached to probe? yes

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TECHNICAL SYSTEM AUDIT CHECKLIST
TRACE METALS SAMPLING
ONTARIO Hydro Method

Date 10/27 + 10/28/99 Time SMEPA Operator Jobin Pattanaik / Observer Paul Green

Test Procedures

Recent Calibrations: Pitot tubes yes
Meter Box yes Thermocouples/thermometers yes
Thimbles Filters checked visually for irregularities? yes
Filters properly centered? yes Labeled? yes
Nozzle size properly selected? yes
All openings of sampling train plugged (pre-test and post-test) yes (Glass Balls + caps)
Impingers properly assembled? yes
Pitot lines checked for leaks and plugging? yes
Meter box leveled? yes Manometers zeroed? yes
Delta H from most recent calibration yes
calculator ~~Nomograph~~ setup correctly? yes K factor Inlet ~.85 outlet ~1.6
Pretest leak check conducted? yes Leakage rate? Good
Care taken to avoid scraping port or stack wall? yes
Effective seal around probe when in-stack? yes
Probe moved to traverse points at proper time? yes
Leak check conducted during port change? Before yes After? yes
Nozzle and pitot tubes kept parallel to stack at all times? yes
Thimble or Filter(s) changed during run? NO
Any particulate lost during filter change? NO
Data forms completed and data recorded properly? yes
calculator ~~Nomograph~~ setting changed with significant change in the stack temperature? yes
Velocity pressure and orifice pressure recorded accurately? yes
Post-test leak check conducted? yes Leakage rate Good <.02 CFm
at inches of mercury
Orsat analysis? yes Stack Integrated yes
Approximate stack temperature IN-330 OUT-190 Gas sample volume ~2 M^3
Percent isokinetic calculated yes

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TECHNICAL SYSTEM AUDIT CHECKLIST
TRACE METALS SAMPLING
Ontario Hydro METHOD

Date 10/27+10/28/99 Time SMEPA Operator _____ Observer _____

Sample Recovery

Brushes: Nylon bristle _____ Other Teflon
Cleaned according to sampling protocol? yes
Wash Bottles: Glass _____ Polyethylene _____ Other Teflon
Cleaned according to sampling protocol? yes
Storage containers: Borosilicate glass yes Other _____
Cleaned according to sampling protocol? yes
Cap material Teflon Leak free? yes
Petri dishes: Borosilicate glass yes Other _____
Cleaned according to sampling protocol? yes
Graduated cylinder: Borosilicate glass yes Other _____
Subdivisions of graduated cylinder ≤ 2 ml? yes
Cleaned according to sampling protocol? yes
Balance type Electronic Calibrated? yes
Probe allowed to cool sufficiently? yes
Probe and sample train openings covered? yes
Clean-up area(s) used on site trailer
Silica gel: Color? Blue Condition? Good
Probe handling: Acetone rinse NO 0.1 N Nitric rinse yes
Particulate recovery: Probe nozzle yes Probe fitting yes
Probe liner yes Front half of filter holder Gas
Blanks collected: Reagent(s) 1N KCl, 5% HNO_3/10% H_2O_2, 4% $KMnO_4$ 10% H_2SO_4
0.1 N Nitric 10% Nitric Filter Thimble Acetone _____
Impinger rinses: 0.1 N Nitric _____ Other rinses as per Ontario Hydro method
Recovery efficiency samples collected from this train? NO
Sample numbers: _____
Samples labeled and stored properly? yes
Liquid levels marked? yes
Filter handling: tweezers used? yes Surgical gloves? Yes
Any particulate lost? NO

~~NOTE: The above TSA would also be applied to the EPA Method 12 test train.~~

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